



WEST VIRGINIA ANNUAL OUTBREAK REPORT 2016

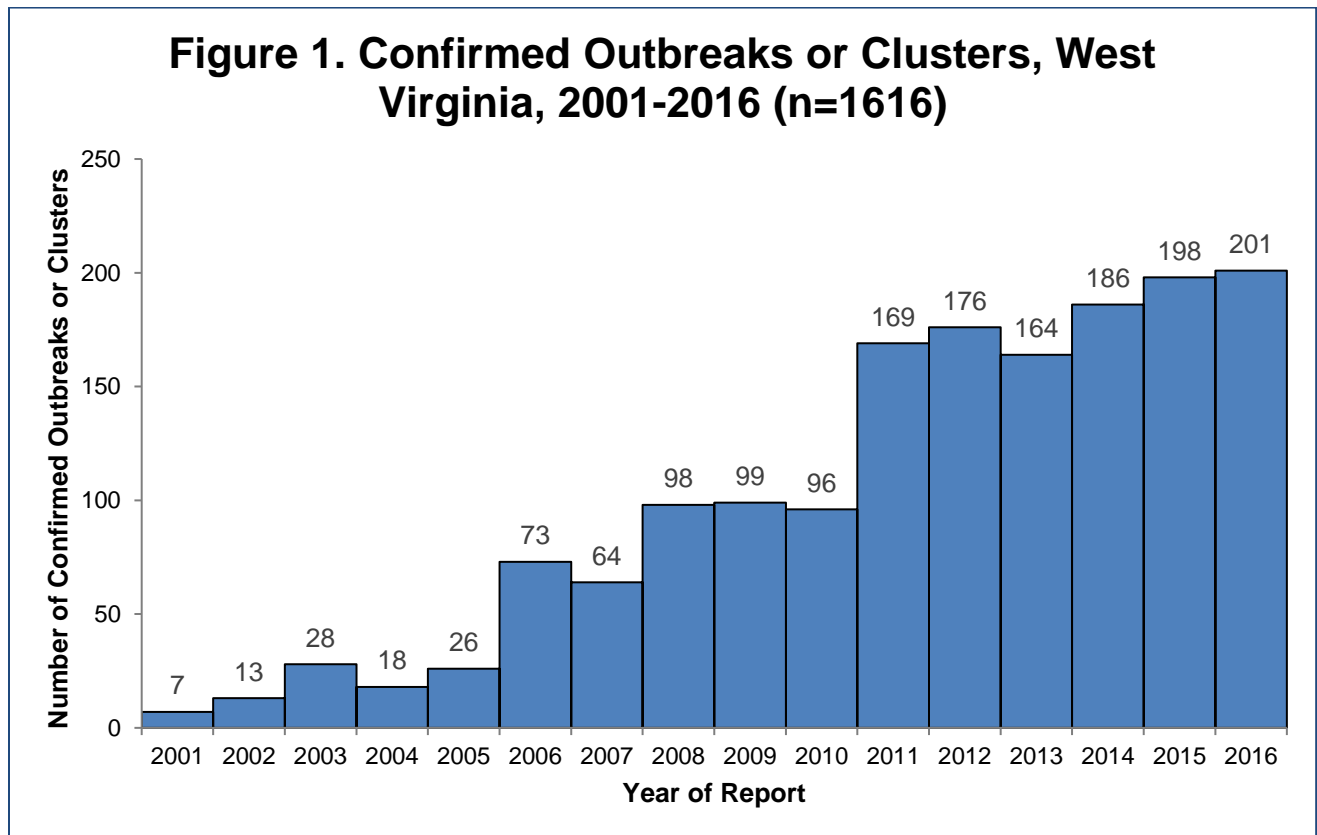
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Introduction

In 2016, there were 219 infectious disease outbreaks identified and reported to local health departments (LHDs). Of these reports, 201 (92%) were confirmed as outbreaks or clusters of disease (Appendix) and the remainder were investigated and determined not be outbreaks. LHDs investigate and report outbreaks with assistance from their regional epidemiologist and the West Virginia Department of Health and Human Resources (DHHR), Bureau for Public Health (BPH), Division of Infectious Disease Epidemiology (DIDE). Results of these investigations were compiled by DIDE and are summarized in this report.

The number of confirmed outbreaks or clusters of disease reported in West Virginia has increased dramatically over the last several years. In 2001, only seven outbreaks or clusters were reported. In 2016, there were 201 confirmed outbreaks or clusters reported (Figure 1).



Methods:

Outbreak data were compiled in Microsoft Excel 2010. Data collected includes information on outbreak type and setting, reporting county and region, time of reporting to LHDs and BPH, clinical diagnosis, laboratory information and specific pathogens, mode of

transmission, completion of final report, and lead investigator. Data were analyzed in Epi Info (TM) version 7.1.3.10.

Results:

Jurisdiction:

In 2016, 192 (96%) confirmed outbreaks were limited to West Virginia residents, and nine (4%) outbreaks involved residents of other states. The Centers for Disease Control and Prevention (CDC) led the investigation in seven multi-state outbreaks, and two investigations were led by other states.

Type of Outbreaks

The most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness. Multidrug-resistant organisms (MDROs) outbreaks represented only 1.5% of total confirmed outbreaks (Table 1).

Table 1. Confirmed Outbreaks by Type, West Virginia, 2016

Outbreak Type	Number of Outbreaks n=201	Percent
Respiratory	75	37
Enteric	60	30
Rash	58	29
Other	7	3.5
MDROs	1	0.5

Outbreak Performance Measures

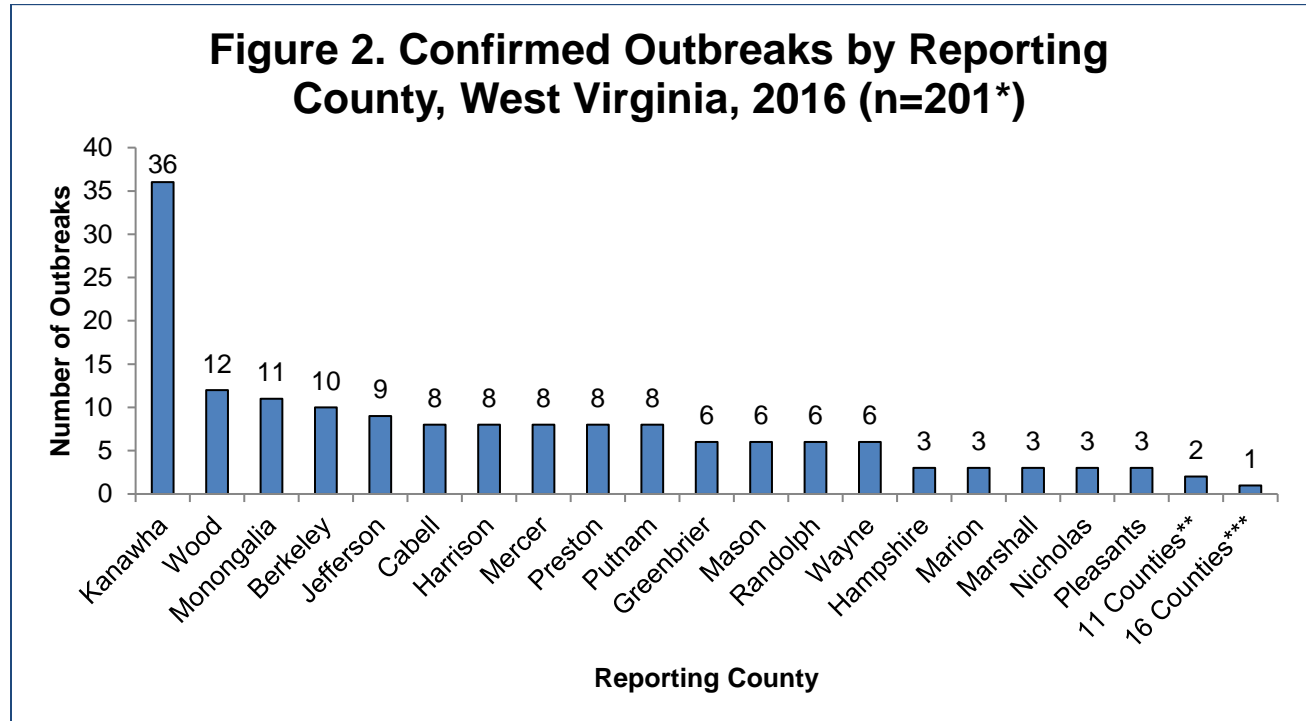
In an effort to improve outbreak response at the state, regional and local levels and to meet several grant requirements, DIDE has implemented outbreak performance measures. These measures include:

- Number of outbreaks reported by each county and region
- Proportion of outbreaks with complete and appropriate laboratory confirmation
- Timeliness of notification between LHDs and BPH/DIDE
- Number of final outbreak reports generated by each county

Outbreaks by Reporting Counties/Regions:

In 2016, 47 (85%) counties reported outbreaks (Table 2).

Six outbreaks were multi-jurisdictional outbreaks (Table 3). The highest number of outbreaks (36, 18%) was reported from Kanawha County followed by Wood County (12, 6%) and Monongalia County (11, 5%) (Figure 2). Individual outbreaks will be reported by surveillance region, rather than by reporting county, to maintain confidentiality of the reporting entity.



* Excludes multi-county outbreaks

**11 counties reported 2 outbreaks

*** 16 counties reported 1 outbreak

Table 2. Confirmed Outbreaks by Reporting County, West Virginia, 2016 (n=201)

Reporting County	Number of Outbreaks
Barbour	1
Berkeley	10
Boone	1
Brooke	1
Cabell	8
Calhoun	2
Clay	2
Doddridge	2
Fayette	1
Gilmer	1

Grant	2
Greenbrier	6
Hampshire	3
Hancock	1
Hardy	1
Harrison	8
Jackson	1
Jefferson	9
Kanawha	36
Lewis	2
Marion	3
Marshall	3
Mason	6
McDowell	1
Mercer	8
Mingo	1
Monongalia	11
Nicholas	3
Pendleton	1
Pleasants	3
Pocahontas	2
Preston	8
Putnam	8
Raleigh	2
Randolph	6
Ritchie	1
Roane	1
Summers	1
Taylor	2
Tucker	2
Tyler	1
Upshur	2
Wayne	6
Wetzel	2
Wood	12
Wyoming	1
Multiple*	6

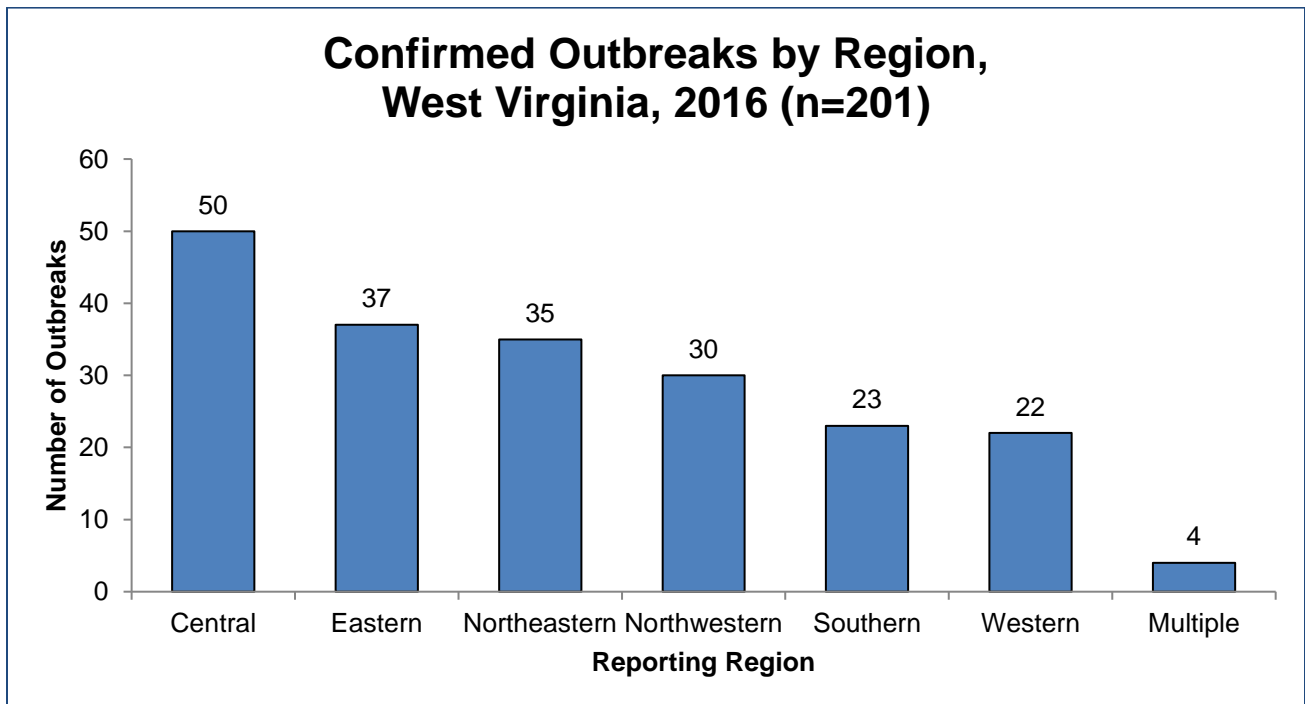
*See Table 3 for details

Table 3. Multi-Jurisdiction Outbreaks, West Virginia, 2016 (n=6)

Jurisdiction	Investigation Lead	Region	Counties with Cases
Multi-	Regional Epi	Northwestern, Central	Calhoun, Clay, and Upshur
Multi-	WV	Multiple	Multiple
Multi-	CDC	All regions	Berkeley, Boone, Fayette, Hancock, Hardy, Jackson, Jefferson, Marshall, Mason, McDowell, Mercer, Monongalia, Monroe, Ohio, Preston, Raleigh, Ritchie, Roane, Summers, Tyler, and Upshur
Multi-	WV	Multiple	Multiple
Multi-	WV	Central	Kanawha and Putnam
Multi-	CDC	Eastern	Berkeley and Jefferson

Surveillance Regions:

All surveillance regions in the State reported outbreaks in 2016 (Figure 3). A map of outbreaks by surveillance region is shown in Figure 4. Table 4 depicts the number of outbreaks from each surveillance region along with the counties, population, number of schools and number of various healthcare facilities in each region.



**Figure 4. Confirmed Outbreaks by Region
West Virginia, January-December 2016 (n=201)***

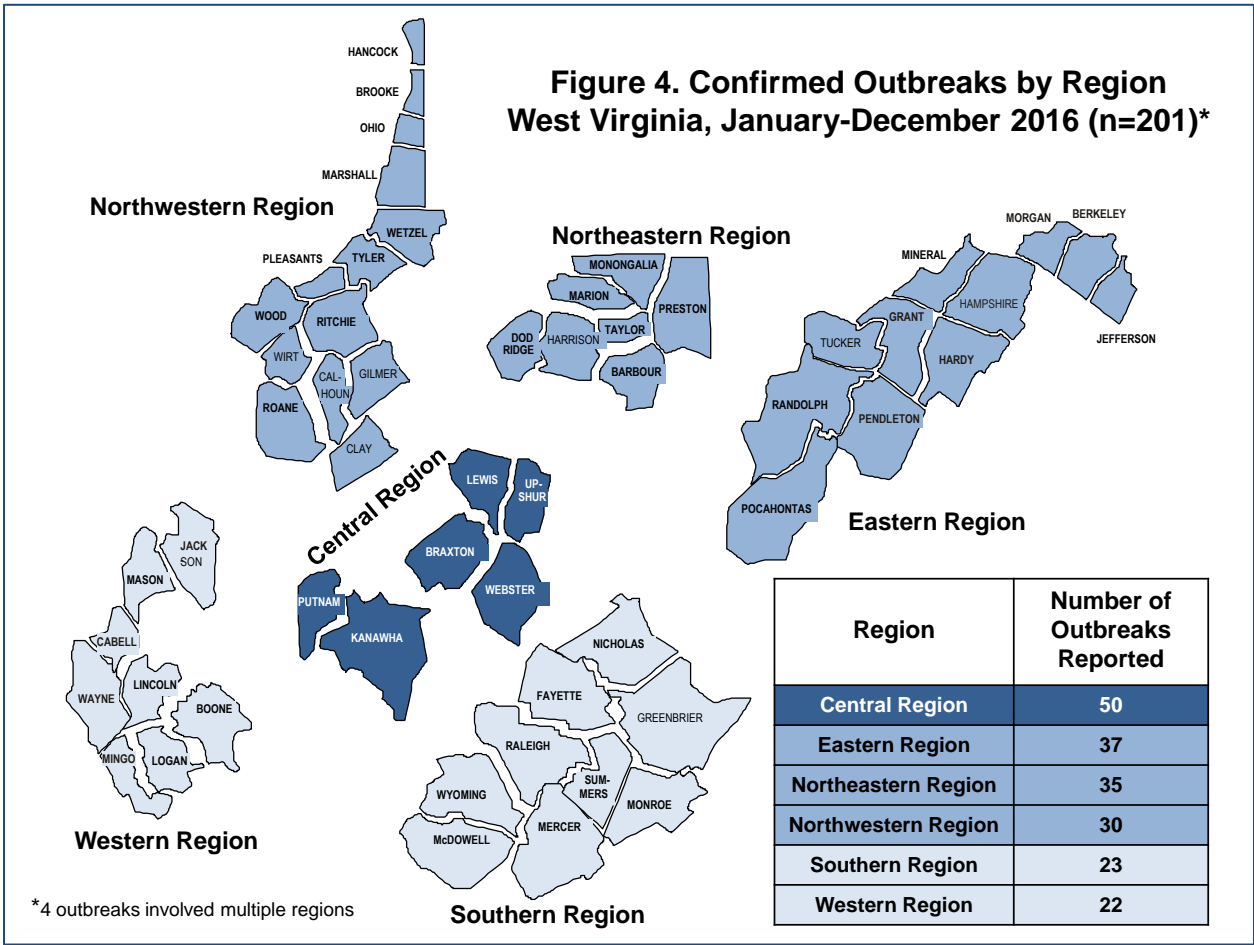


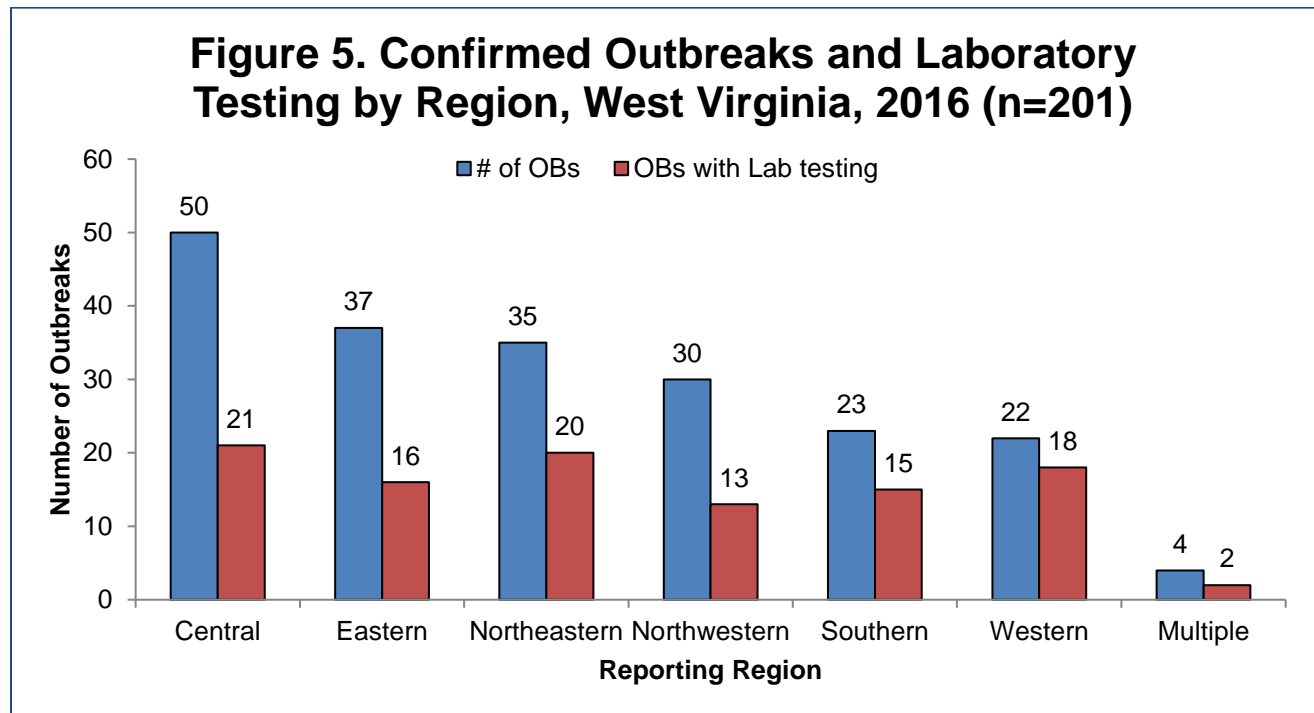
Table 4. Surveillance Regions by Counties, Population*, Number of Schools, Healthcare Facilities, and Confirmed Outbreaks**, West Virginia, 2016 (n=201)

Region	Counties	Number of Outbreaks	Populations	Schools	Acute Care Hospitals	Critical Access Hospitals	Long-Term Care Facilities
Central Region	Braxton, Kanawha, Lewis, Putnam, Upshur, Webster	50	312,973	127	7	3	18
Eastern Region	Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral, Morgan, Pendleton, Pocahontas Randolph, Tucker	37	309,057	114	2	6	20
Northeastern Region	Barbour, Doddridge, Harrison, Marion, Monongalia, Preston, Taylor	35	301,645	91	4	3	22
Northwestern Region	Brooke, Calhoun, Clay, Gilmore, Hancock, Marshall, Ohio, Pleasants, Ritchie, Roane, Tyler, Wetzel, Wirt, Wood	30	307,065	118	8	3	26
Southern Region	Fayette, Greenbrier, McDowell, Mercer, Monroe, Nicholas, Raleigh, Summers, Wyoming	23	321,261	129	7	3	26
Western Region	Boone, Cabell, Jackson, Lincoln, Logan, Mason, Mingo, Wayne	22	303,412	119	6	2	16

* Using 2012 Census projections ** Excludes multi-region outbreak

Proportion of Outbreaks with Laboratory Testing:

Laboratory testing is crucial in outbreak management. Timely collection of specimens facilitates diagnosis and institution of appropriate control measures. Laboratory confirmation of outbreaks is one of the surveillance indicators and considered a performance measure for LHDs. As shown in Figure 5, the percentage of outbreaks with laboratory testing varied by region from 58% to 74% with mean and median of 65% and 67% respectively. Of the 198 confirmed outbreaks 138 (70%) had laboratory testing.



Some outbreaks do not require laboratory testing. Outbreaks such as scabies and hand, foot and mouth disease are confirmed by clinical diagnosis and/or symptom presentation and lab testing is not necessary. However, all respiratory outbreaks should have laboratory testing and laboratory testing is also recommended for enteric outbreaks.

Figure 6 depicts laboratory confirmation of respiratory disease outbreaks by each surveillance region. Of the 75 confirmed respiratory outbreaks, 66 (88%) had laboratory testing done.

Figure 6. Laboratory Confirmation of Respiratory Outbreaks by Region, West Virginia, 2016 (n=75)

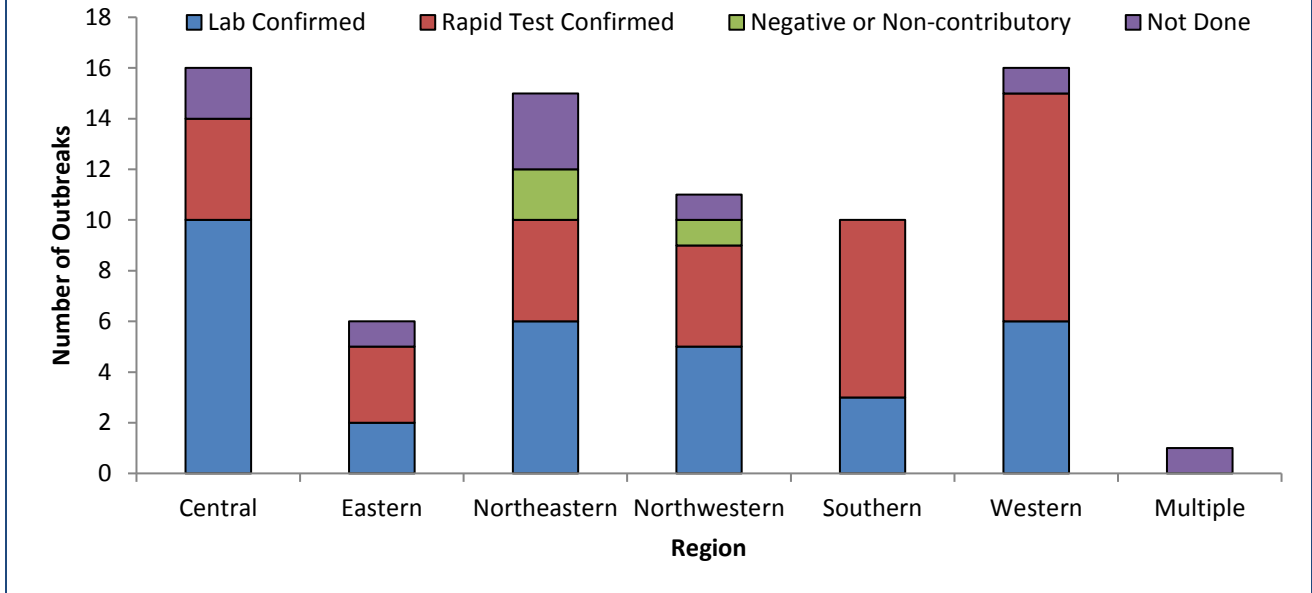
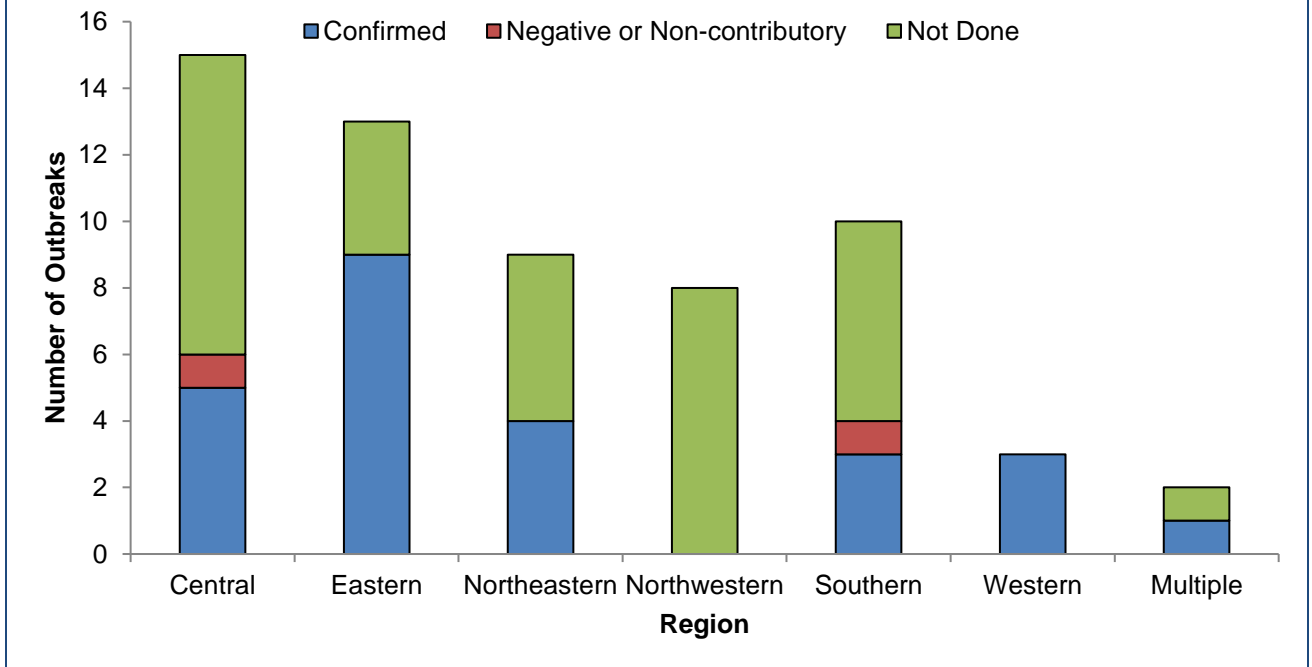


Figure 7 illustrates laboratory confirmation of enteric outbreaks by regions. Of the 60 confirmed enteric disease outbreaks, 27 (45%) had laboratory testing.

Figure 7. Laboratory Confirmation of Enteric Outbreaks by Region, West Virginia, 2016 (n=60)



Outbreak Leadership:

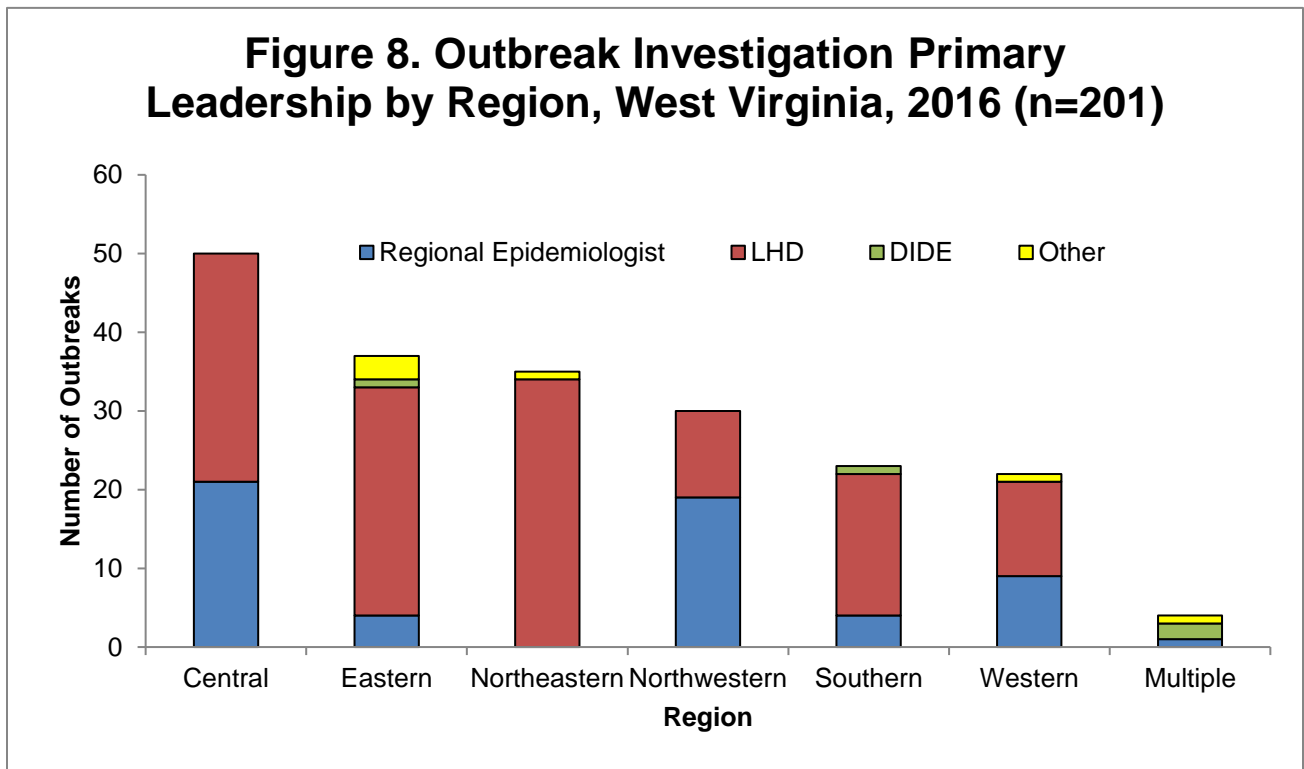
As a requirement to receive Epidemiology and Laboratory Capacity (ELC) and/or Public Health Emergency Response funds, the State and LHDs are required to verify outbreak investigation leadership.

In 2016, LHDs led the investigation in 133 (66%) outbreaks, followed by regional epidemiologists 58 (29%) and BPH/DIDE 4 (2%). CDC or other states led the investigations in 6 (3%) multi-state outbreaks (Table 5).

Table 5. Confirmed Outbreaks by Primary Leadership, West Virginia, 2016

Primary Leadership	Number of Outbreaks (n=201)	Percent
Local Health Departments (LHDs)	133	66%
Regional Epidemiologists	58	29%
BPH/DIDE	4	2%
Other (CDC or other states)	6	3%

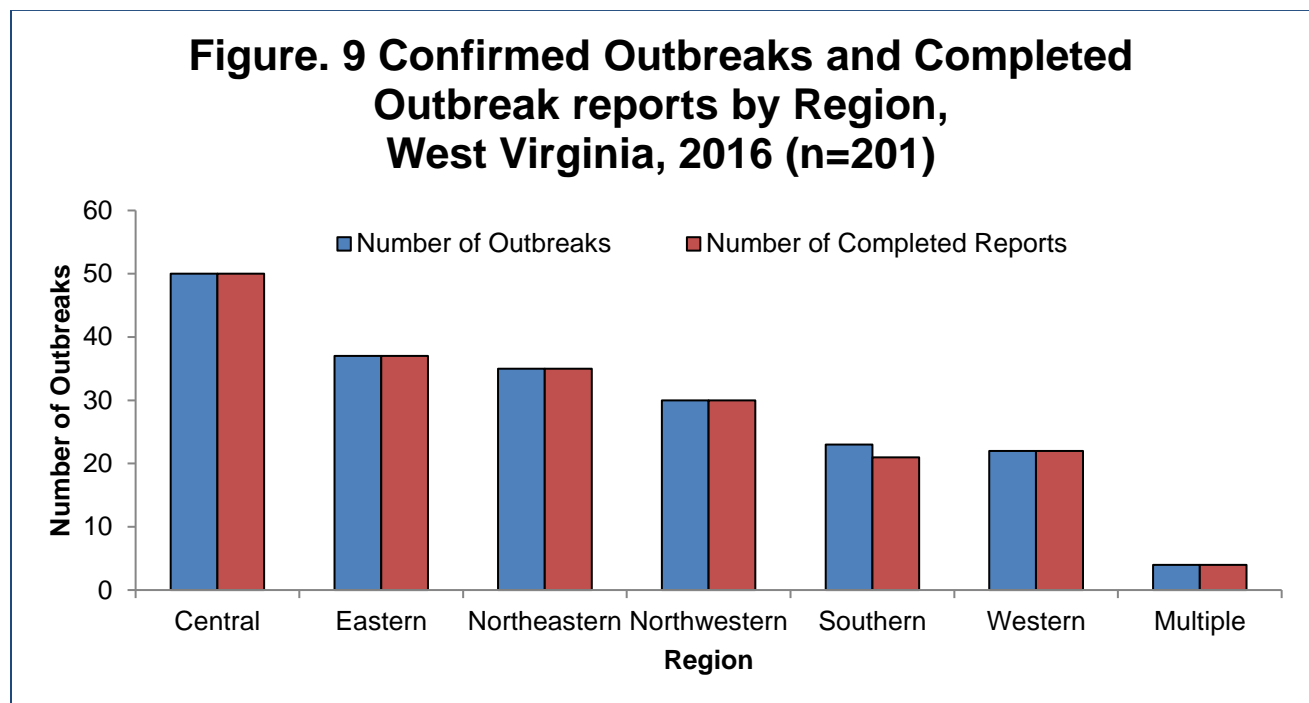
Outbreak investigation primary leadership varies by surveillance region. In most of the regions, primary leadership is collaboratively assigned between regional epidemiologists and the LHDs. Figure 8 illustrates outbreak investigation leadership by region.



Outbreak Investigation Reports:

In 2013, BPH began tracking the number of final outbreak reports that were generated by LHDs and shared with stakeholders as per grant requirements and CDC guidelines. DIDE created outbreak report templates and provided them online for most types of outbreaks in a fillable format to assist LHD staff and regional epidemiologists in completing the outbreak reports within 30 days of outbreak closure.

In 2016, a final outbreak report was completed in 199 (99%) outbreaks. As shown in Figure 9, five of the six regions completed reports for 100% of their outbreaks. The percentage of completed outbreak reports by region varied from 91% to 100% with mean and median of 99% and 100% respectively. In 2013, the mean and median of completed outbreak reports were 59% and 62% respectively which indicates significant improvement during 2016.

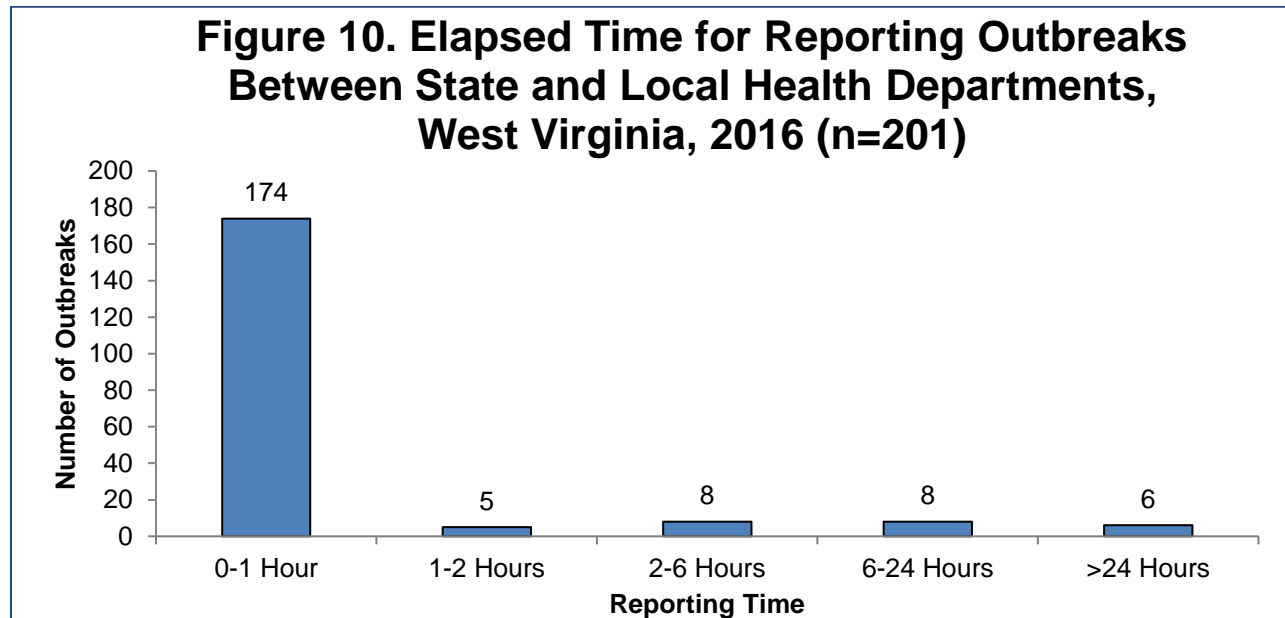


Outbreak Reporting Time:

According to the Reportable Disease Rule (§64CSR7), outbreaks or clusters of any illness or condition in any setting are immediately reportable to the LHD. As a condition of receiving threat preparedness funding, LHDs are required to report suspected outbreaks or clusters to the BPH, DIDE within 60 minutes.

To measure adherence to this requirement, date and time of report to the LHD and to DIDE are recorded on a standard outbreak intake form so that elapsed reporting time can be calculated.

In 2016, the date and time of report to the LHD and BPH were collected in all confirmed outbreaks. The mean and median of time elapsed between reporting to the LHD and reporting to the BPH was 255 and 20 minutes respectively. The range of time between the time the outbreak was reported to the LHD and the time the outbreak was reported to the BPH was 0 to 12,485 minutes. Of the 201 confirmed outbreaks, same-day notification occurred for 189 (98%) outbreaks and 176 (91%) were within 60 minutes (Figure 10).



**Summary of Outbreak Performance Measures by Region/County
West Virginia, 2016**

Tables 6 through 13 summarize performance measures by county and region.

Table 6. Outbreak Performance Measures by Region, West Virginia, 2016

Region	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Central Region	50	50 (100%)	21 (42%)	16
Eastern Region	37	37 (100%)	16 (43%)	30
Northeastern Region	35	35 (100%)	20 (57%)	25
Northwestern Region	30	30 (100%)	13 (43%)	18
Southern Region	23	21 (91%)	15 (71%)	14
Western Region	22	22 (100%)	17 (77%)	23
Multiple Regions	4	4 (100%)	2 (50%)	0
All Regions	201	199 (99%)	105 (52%)	20

Table 7. Outbreak Performance Measures by County, Central Region, West Virginia, 2016

Central Region	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Braxton	0			
Kanawha	36	36 (100%)	15 (42%)	18
Lewis	2	2 (100%)	1 (50%)	37
Putnam	9	9 (100%)	3 (33%)	15
Upshur	2	2 (100%)	1 (50%)	6262
Webster	0			
Kanawha/Putnam*	1	1 (100%)	1 (100%)	0
Central Region	50	50 (100%)	21 (42%)	16

*Outbreak involved both counties

Table 8. Outbreak Performance Measures by County, Eastern Region, West Virginia, 2016

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Berkeley	10	10 (100%)	2 (20%)	26
Grant	2	2 (100%)	2 (100%)	45
Hampshire	3	3 (100%)	3 (100%)	26
Hardy	1	1 (100%)	0 (0%)	33
Jefferson	9	9 (100%)	4 (44%)	45
Mineral	0			
Morgan	0			
Pendleton	1	1 (100%)	1 (100%)	30
Pocahontas	2	2 (100%)	1 (50%)	104
Randolph	6	6 (100%)	2 (33%)	14
Tucker	2	2 (100%)	1 (50%)	45
Berkeley/Jefferson*	1	1 (100%)	1 (100%)	0
Eastern Region	37	37 (100%)	16 (43%)	30

*Outbreak involved both counties

Table 9. Outbreak Performance Measures by County, Northeastern Region, West Virginia, 2016

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Barbour	1	1 (100%)	0 (0%)	25
Doddridge	2	2 (100%)	1 (50%)	273
Harrison	8	8 (100%)	5 (63%)	23
Marion	3	3 (100%)	1 (33%)	15
Monongalia	11	11 (100%)	8 (73%)	30
Preston	8	8 (100%)	4 (50%)	15
Taylor	2	2 (100%)	1 (50%)	10
Northeastern Region	35	35 (100%)	20 (57%)	25

Table 10. Outbreak Performance Measures by County, Northwestern Region, West Virginia, 2016

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Brooke	1	1 (100%)	0 (0%)	1470
Calhoun	2	2 (100%)	1 (50%)	13
Clay	2	2 (100%)	1 (50%)	20
Gilmer	1	1 (100%)	1 (100%)	30
Hancock	1	1 (100%)	0 (0%)	45
Marshall	3	3 (100%)	1 (33%)	35
Ohio	0			
Pleasants	3	3 (100%)	1 (33%)	13
Richie	1	1 (100%)	0 (0%)	9
Roane	1	1 (100%)	0 (0%)	30
Tyler	1	1 (100%)	1 (100%)	10
Wetzel	2	2 (100%)	2 (100%)	310
Wirt	0			
Wood	12	12 (100%)	5 (42%)	13
Northwestern Region	30	30 (100%)	13 (45%)	18

Table 11. Outbreak Performance Measures by County, Southern Region, West Virginia, 2016

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Fayette	1	1 (100%)	1 (100%)	20
Greenbrier	6	4 (66%)	4 (66%)	13
McDowell	1	1 (100%)	1 (100%)	75
Mercer	8	8 (100%)	2 (25%)	15
Monroe	0			
Nicholas	3	3 (100%)	3 (100%)	7
Raleigh	2	2 (100%)	2 (100%)	20
Summers	1	1 (100%)	1 (100%)	58
Wyoming	1	1 (100%)	1 (100%)	11
Southern Region	23	21 (100%)	15	14

Table 12. Outbreak Performance Measures by County, Western Region, West Virginia, 2016

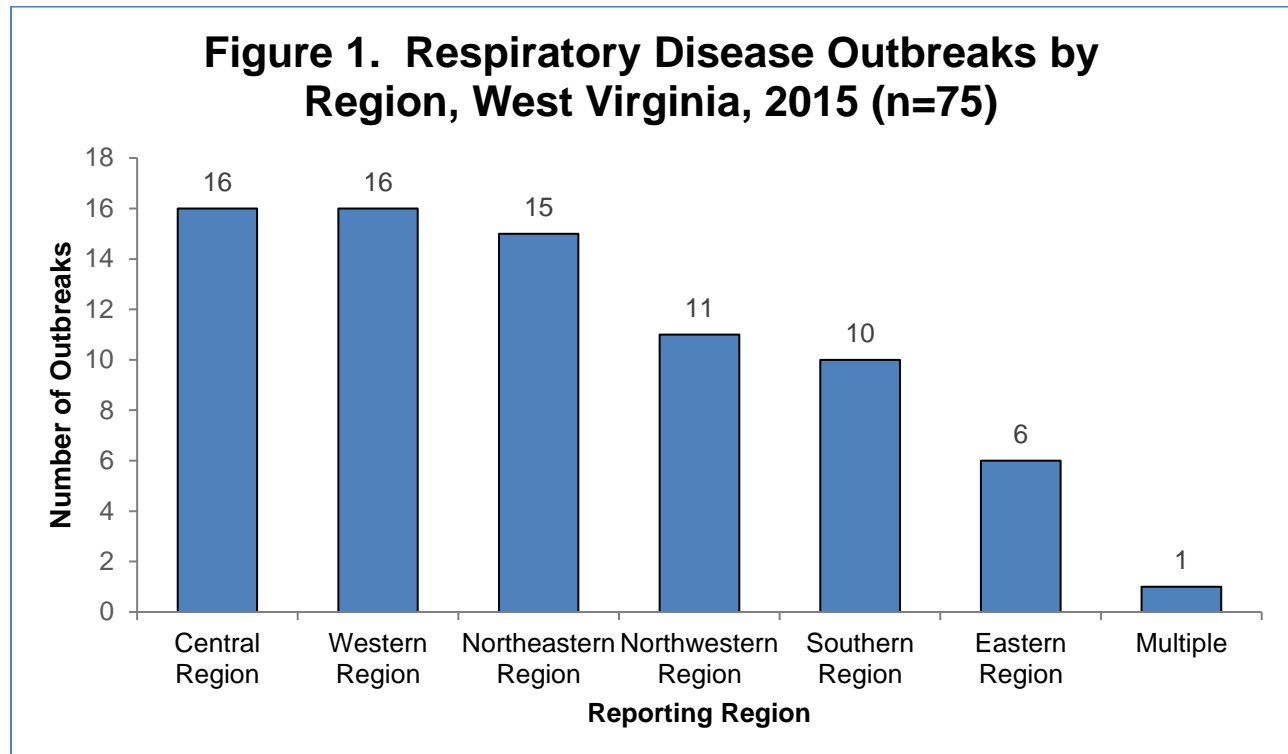
County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Boone	1	1 (100%)	0 (0%)	1140
Cabell	8	8 (100%)	5 (63%)	33
Jackson	1	1 (100%)	1 (100%)	7
Lincoln	0			
Logan	0			
Mason	6	6 (100%)	6 (100%)	25
Mingo	1	1 (100%)	1 (100%)	153
Wayne	5	5 (100%)	5 (100%)	18
Western Region	22	22 (100%)	17 (77%)	23

Table 13. Outbreak Performance Measures, Outbreaks Reported in Multiple Counties/Regions, West Virginia, 2016

Multiple Regions	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes
Multiple Regions	4	4 (100%)	2 (50%)	0

Respiratory Disease Outbreaks, West Virginia, 2016 (n=75)

Outbreaks of respiratory illness were the most common type of disease outbreak reported in 2016, accounting for 75 (37%) confirmed outbreaks (Table 1). Respiratory illness outbreaks were reported by 32 (58%) counties from the six surveillance regions (Figure 11).



Influenza outbreaks were the most commonly reported respiratory disease outbreak followed by acute respiratory illness (ARI), and streptococcal pharyngitis (Table 14).

An outbreak of influenza in a long-term care facility (LTCF) is defined as three or more cases of influenza-like illness (ILI) occurring within 72 hours in residents, or a sudden increase in ILI, or one case of influenza confirmed by any laboratory testing method in the presence of any other reported ILI cases.

An outbreak of ARI is defined as acute onset of symptoms of upper and/or lower respiratory illness in excess of what is expected for a specific time and location with known or unknown etiologic agents.

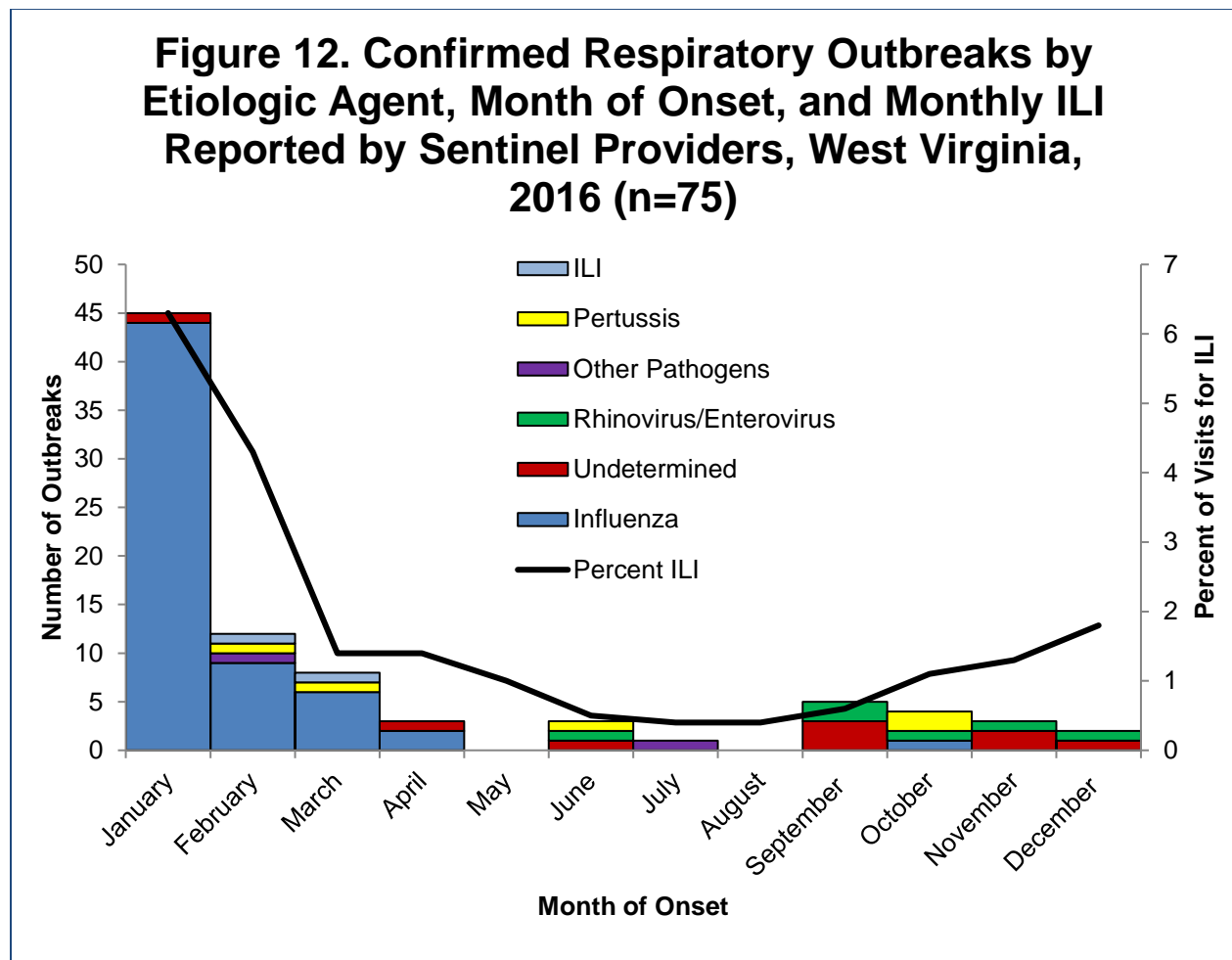
An outbreak of influenza in healthy populations is defined as increased absenteeism in association with influenza-like illness and/or laboratory confirmed influenza (e.g., schools, workplaces, daycares, etc.); or three or more cases of influenza-like illness in a congregate setting within a 3-day period; or two or more laboratory-confirmed cases of influenza within a 3-day period in a congregate setting.

Respiratory Disease Outbreaks by Clinical Syndrome, West Virginia, 2016

Clinical Diagnosis (Syndrome)	Number of Outbreaks (n=75)	Percent
Influenza	38	51
Acute Respiratory Illness (ARI)	33	44
<i>Streptococcal</i> pharyngitis	3	4
Pneumonia	1	1

Of all respiratory outbreaks, 63 (84%) were laboratory confirmed, 3 (4%) had laboratory testing that was negative or noncontributory, and in 9 (12%) outbreaks, laboratory testing was not done.

Figure 12 illustrates respiratory disease outbreaks by etiologic agent and month of onset. The trend of influenza outbreaks in 2016 was consistent with that of ILI reported by sentinel providers.



Respiratory outbreaks are listed by etiologic agents including other pathogens in table 15.

Table 15. Respiratory Disease Outbreaks by Etiologic Agent, West Virginia, 2016

ETIOLOGIC AGENT	Frequency	Percent
Influenza A	13	17.33
Undetermined	12	16
Influenza (Not typed)	10	13.33
Influenza B	5	6.67
Respiratory Syncytial Virus (RSV)	5	6.67
Rhinovirus/Enterovirus	4	5.33
Influenza A and B	3	4
Influenza A H1N1	3	4
Influenza A H3	3	4
Streptococcus pyogenes	3	4
Human Metapneumovirus	2	2.67
Coronavirus, Entero/rhinovirus	1	1.33
Coronavirus, Metapneumovirus	1	1.33
Human Metapneumovirus and Entero/Rhinovirus	1	1.33
Influenza A and RSV	1	1.33
Influenza A H1N1 and B and RSV	1	1.33
Influenza A H3, Parainfluenza, Entero/rhinovirus	1	1.33
Influenza B and Entero/Rhinovirus	1	1.33
Influenza	1	1.33
Influenza A and Coronavirus	1	1.33
Picornavirus	1	1.33
<i>Pseudomonas aeruginosa</i>	1	1.33

The majority of respiratory disease outbreaks were reported in LTCFs followed by schools and daycares (Table 16).

Table 16. Respiratory Disease Outbreaks by Transmission Setting, West Virginia, 2016

Transmission Setting	Number of Outbreaks (n=75)	Percent
LTCFs	45	60
Schools	12	16
Daycares	9	12
Hospital	4	5
Assisted Living Facility (ALF)	1	1
Rehabilitation center	1	1
Workplace	1	1
Correctional Facilities	1	1
Other	1	1

Influenza Outbreaks:

In 2016, there were 38 laboratory confirmed influenza outbreaks, accounting for 51% of all respiratory outbreaks. Additionally, influenza viruses were detected among other respiratory viruses in 5 more outbreaks.

Ten (26%) influenza outbreaks were confirmed by Polymerase Chain Reaction (PCR) and 28 (74%) were confirmed by rapid influenza diagnostic test (RIDT). The five outbreaks diagnosed with multiple respiratory viruses including influenza were confirmed by PCR. Table 17 depicts influenza outbreaks by type of influenza virus.

Table 17. Influenza Outbreaks by Type of Influenza Virus, West Virginia, 2016

Etiologic Agent	Number of Outbreaks (n=38)	Percent
Influenza A	13	34
Influenza (no typing)	11	29
Influenza B	5	13
Influenza A H3	3	8
Influenza A H1N1	3	8
Influenza A and B	3	2

LTCFs reported the majority (18, 47%) of influenza outbreaks (Table 18). Influenza outbreaks are not uncommon among residents of LTCFs and other institutionalized populations. LTCF residents have a higher risk for complications from influenza, including death.

Table 18. Influenza Outbreaks by Transmission Setting, West Virginia, 2016

Transmission Setting	Number of Outbreaks (n=38)	Percent
LTCFs	18	47
Schools	10	26
Daycares	5	13
ALF	1	3
Rehabilitation Facility	1	3
Hospital	1	3
Correctional Facility	1	3
Group Home	1	3

Of the ten influenza outbreaks reported in schools, nine were confirmed by RIDT and one by PCR. Influenza A was detected in six school outbreaks including two outbreaks with both influenza A and B. Influenza with no typing was detected in the remaining four outbreaks. The burden of illness for influenza outbreaks in schools is determined by following the daily absentee rate. The average highest absentee rate in the ten outbreaks was 23% with a range of 14% to 63%.

Acute Respiratory Illness Outbreaks:

In 2016, there were 33 ARI outbreaks. Sixteen (48%) outbreaks were caused by non-influenza respiratory viruses and five (15%) were caused by influenza in conjunction with non-influenza respiratory viruses (Table 15). For the remaining 12, the etiology was not known.

Non-Viral Respiratory Outbreaks:

Streptococcus pharyngitis

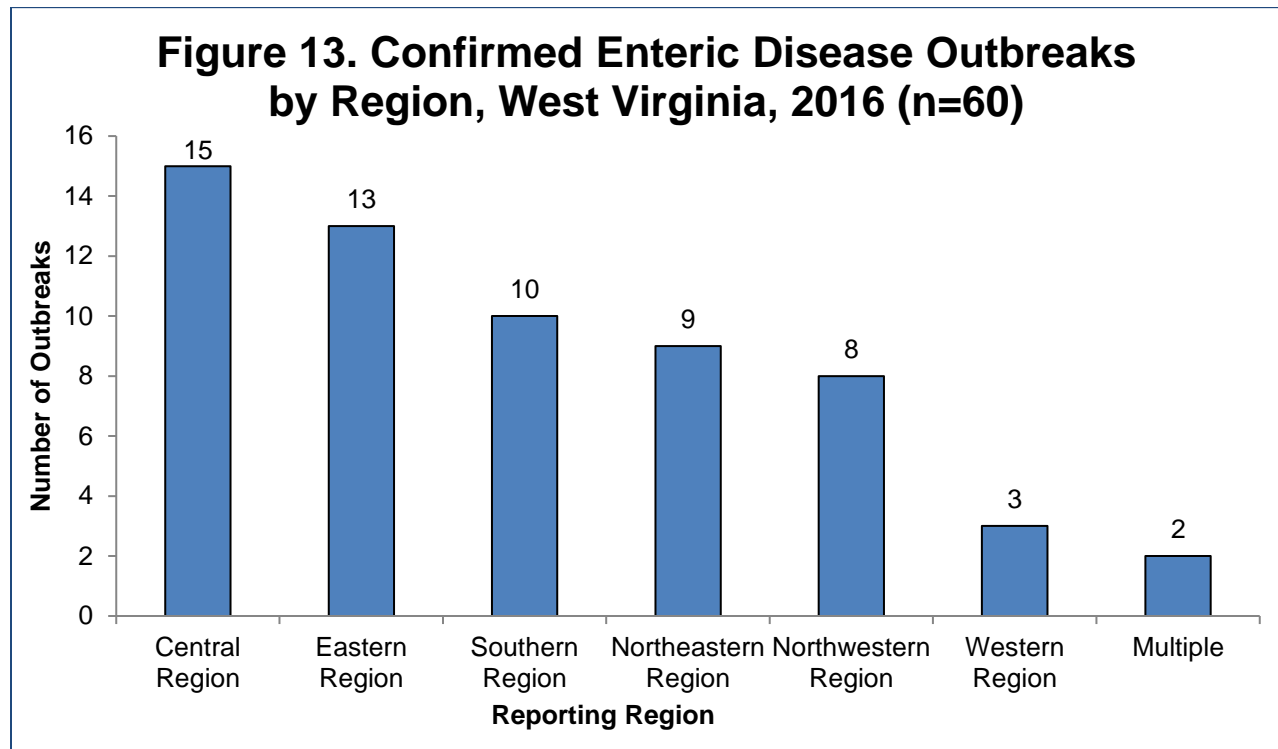
There were three outbreaks of *Streptococcus pharyngitis* reported in 2016, two from schools and one from a daycare. *Streptococcus pharyngitis*, often referred to as strep throat, is a bacterial illness caused by group A *Streptococcus* (GAS) and presents clinically with fever and sore throat. Hand washing, respiratory etiquette and exclusion of case-patients for at least one day after starting effective antibiotics are crucial steps to control these outbreaks.

***Pseudomonas aeruginosa* Pneumonia**

Six cases of pneumonia were identified in a hospital specialty unit, prompting the facility to report the outbreak. *Pseudomonas aeruginosa* was isolated from all cases. No additional cases were identified after the hospital intensified infection control measures and environmental cleaning.

Enteric Disease Outbreaks, West Virginia, 2016 (n=60)

Outbreaks of enteric illness were the second most common type of disease outbreak in 2016, accounting for 30% of all outbreaks (Table 1). Sixty enteric disease outbreaks were reported by 26 (47%) counties. All six surveillance regions reported enteric disease outbreaks (Figure 13). Seven enteric illness outbreaks were reported in West Virginia as part of multi-state outbreaks. CDC and other states were the lead investigators for the multi-state outbreaks.



Thirty-three (55%) enteric disease outbreaks were reported from healthcare facilities including 30 (50%) from LTCFs (Table 19).

Table 19. Enteric Disease Outbreaks by Transmission Setting, West Virginia, 2016

Transmission Setting	Number of Outbreaks (n=60)	Percent
LTCFs	30	50
Communities	17	28
Schools	6	10
Other	3	5
ALFs	3	5
Daycare	1	2
Correctional Facility	1	2

Outbreaks of acute gastroenteritis were the most common type of enteric disease outbreak, accounting for 41 (57%) outbreaks, followed by outbreaks of norovirus gastroenteritis (18, 25%) outbreaks (Table 20). Acute gastroenteritis outbreaks were defined as outbreaks of illness characterized by acute onset of vomiting and/or diarrhea without laboratory confirmation. An outbreak of norovirus gastroenteritis is defined as an outbreak of acute gastroenteritis with laboratory confirmation of norovirus.

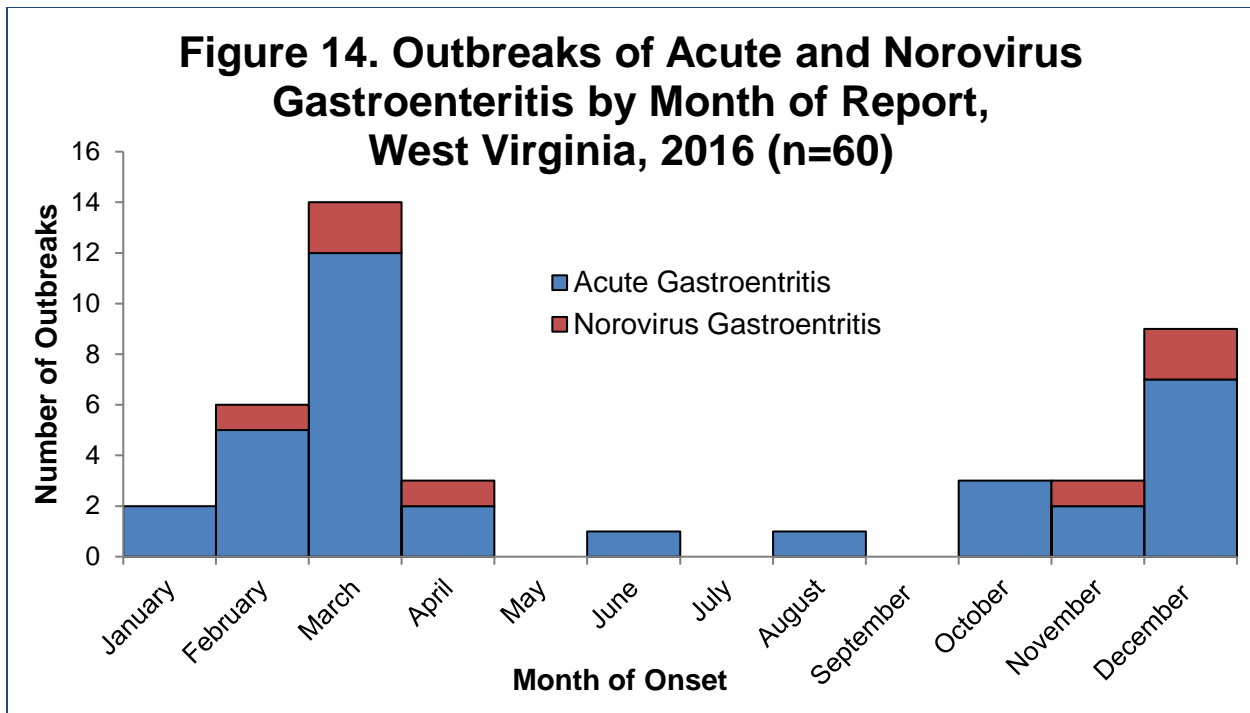
Among the 35 outbreaks characterized as acute gastroenteritis, laboratory tests were negative or noncontributory in 2 and not done in 33 outbreaks. The outbreaks followed a pattern of transmission and seasonality similar to norovirus gastroenteritis outbreaks, suggesting that many of these outbreaks were likely caused by norovirus (Figure 14).

All norovirus outbreaks were confirmed by PCR testing. Norovirus genotype II accounted for three norovirus outbreaks, genotype I accounted for one outbreak, one norovirus outbreak was caused by norovirus genotype I and II, and typing was not done for 2 outbreaks.

Table 20. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2016

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=60)	Percent
Acute Gastroenteritis	35	65
Salmonellosis	8	13
Norovirus Gastroenteritis	7	12
Hepatitis A	2	3
Shiga toxin-producing <i>Escherichia coli</i> (STEC) Gastroenteritis	2	3
Campylobacteriosis	1	2
Cryptosporidiosis	1	2
Campylobacteriosis and Cryptosporidiosis	1	2
Shigellosis	1	2
Vibriosis	1	2
Sapovirus Gastroenteritis	1	2

Most enteric disease outbreaks (40, 67%) were due to person to person transmission followed by foodborne illness (7, 12%), animal contact (2, 3%), waterborne illness (2, 3%), and common source not otherwise specified (2, 3%). The source of illness could not be determined in the remaining enteric disease outbreaks (7, 12%).



In 2016, there were two outbreaks of hepatitis A. The first was part of a multi-state outbreak, with investigation led by the CDC. According to the CDC, epidemiologic and traceback evidence indicated that imported frozen strawberries were the likely source of this outbreak. Most patients interviewed reported drinking smoothies containing strawberries at a chain restaurant. There were 143 cases reported from 9 states including 7 cases from West Virginia.

The second outbreak of hepatitis A was reported from the Eastern surveillance region when a food handler developed hepatitis A after returning from a trip abroad. The food handler worked a few days while symptomatic in Restaurants A and B. A second case was identified and epidemiologically linked to the index case by eating in Restaurant A. Active surveillance revealed no additional cases. Hepatitis A vaccination was offered to food handlers in the two restaurants and other contacts as per protocol.

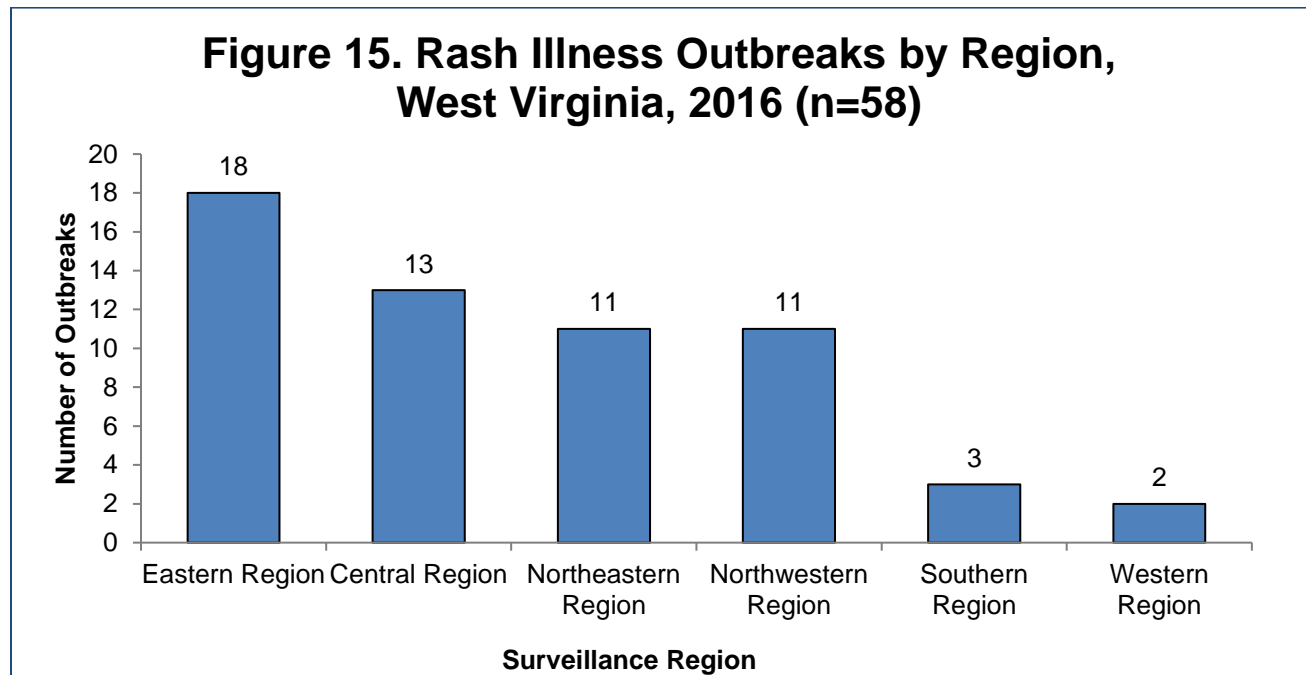
In 2016, there were 8 outbreaks of salmonellosis. Five salmonellosis outbreaks were part of multistate outbreak investigations led by the CDC. In one of these five outbreaks, there were 895 cases identified nationally including 32 from West Virginia. This outbreak was traced back to live poultry.

Three salmonellosis outbreaks investigations were led by BPH/DIDE. The first one was reported in March, when five cases of *Salmonella enteritidis* were identified in two counties. Epidemiologic investigation identified chicks that were sold locally to be a possible source of the outbreak. The second was reported in June when three cases of *Salmonella miami* were identified in one county. All cases reported eating at the same restaurant. Active surveillance revealed no additional cases. Epidemiologic and

environmental investigation suggested this outbreak may have been due to foodborne illness. The third outbreak was reported in July when five cases (two confirmed and three probable) of *Salmonella enteritidis* were identified. This outbreak was due to person to person transmission. No further cases were identified in this community.

Rash Illness Outbreaks, West Virginia, 2016 (n=58)

Rash illness outbreaks were the third most common outbreak type in 2016, with 58 (29%) confirmed outbreaks (Table 1). Twenty six (47%) counties from all six surveillance regions reported rash illness outbreaks (Figure 15).



The most common type of rash illness outbreaks reported was hand, foot, and mouth disease (HFMD), followed by scabies, as shown in Table 21.

Table 21. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2016

Clinical Diagnosis	Number of Outbreaks (n=58)	Percent
HFMD	40	69
Scabies	8	14
Undifferentiated Rash Illness	4	15
<i>Staphylococcus aureus</i> Skin Infection	2	6
Impetigo	2	3
Herpes Gladiatorum	1	2
Varicella	1	2

In 2016, there was marked increase in hand, foot and mouth disease (HFMD) (Figure 16). HFMD is a common viral illness that usually affects infants and children younger than 5 years old. However, it can sometimes occur in older children and adults. The viruses that cause HFMD are spread person to person through close personal contact, coughing or sneezing, contact with feces, or contact with contaminated objects and surfaces. The most common cause in the U.S. is enterovirus serotype coxsackievirus. Symptoms of HFMD include fever, mouth sores, and a skin rash. There is no vaccine to protect against the viruses that cause HFMD. Prevention strategies include hand washing, avoiding close contact with an infected person and disinfecting dirty surfaces and soiled items such as toys.

Forty confirmed outbreaks of HFMD were reported by 18 (32%) counties from all surveillance regions. Nineteen (48%) outbreaks were reported from daycares, 19 (48%) from schools, and 2 (4%) from communities involving multiple schools. In several outbreaks, cases included children over the age of 5 years and a few outbreaks occurred in high schools. The peak of outbreaks (19, 48%) occurred in the month of September (Figure 17) which matches what is previously known about the seasonality of enterovirus activity. All HFMD were confirmed by physician diagnosis based on symptom presentation except one outbreak in which two specimens tested by CDC were positive for enterovirus serotype coxsackievirus A6.

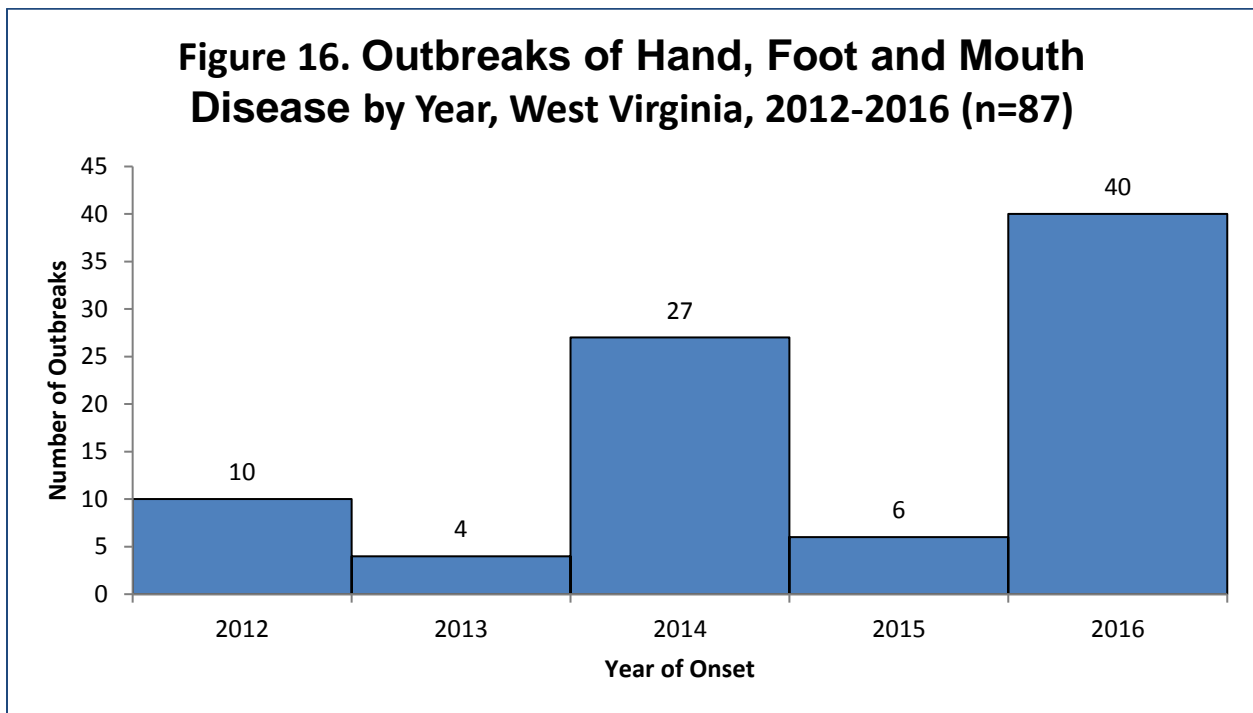
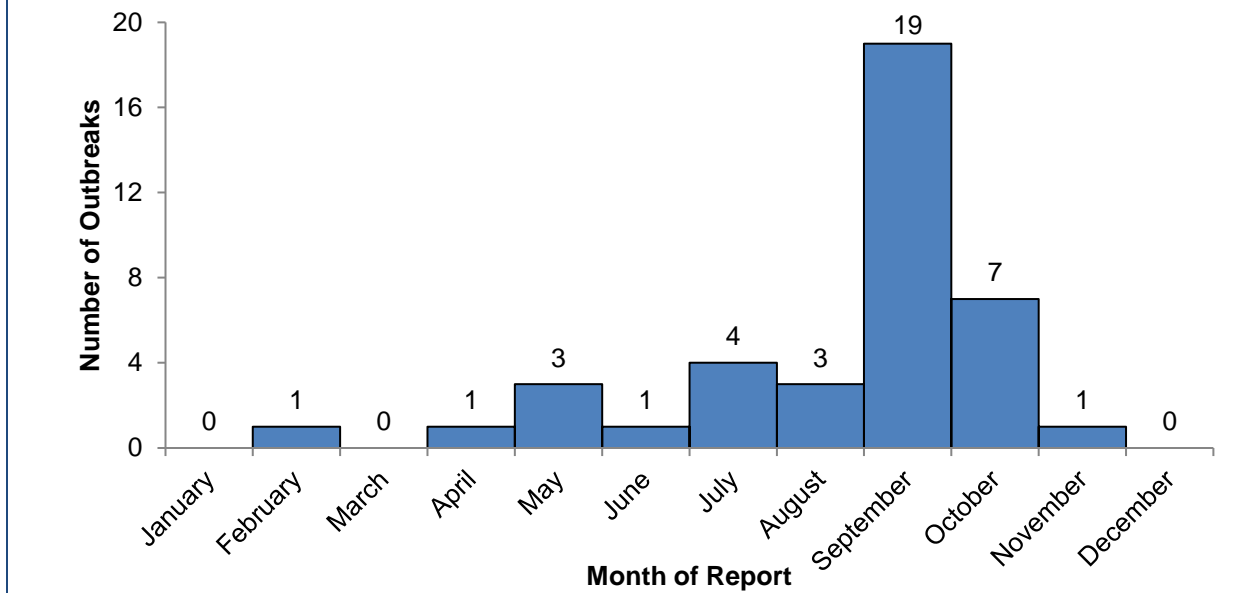


Figure 17. Outbreaks of Hand, Foot and Mouth Disease by Month, West Virginia, 2016 (n=40)



There were 8 scabies outbreaks reported in 2016 from three surveillance regions. Two outbreaks were laboratory confirmed and 6 clinically diagnosed based on symptom presentation. Six of the scabies outbreaks were reported from LTCFs, one from a correctional facility, and one from a group home (Table 22).

Human scabies is caused by an infestation of the skin by the human itch mite *Sarcoptes scabiei*. The most common symptoms of scabies are intense itching and a skin rash. Scabies is transmitted from person to person by direct, prolonged, skin-to-skin contact. Scabies is a common condition that affects people of all races and social classes. It can spread easily under crowded conditions where close body and skin contact is common. Scabies outbreaks are common among institutionalized populations such as LTCFs and correctional facilities.

Table 22. Outbreaks of Scabies by Transmission Setting, West Virginia, 2016

Transmission Settings	Number of Outbreaks (n=8)	Percent
LTCFs	6	75
Correctional Facilities	1	12.5
Group Home	1	12.5

Two outbreaks of skin infections caused by *Staphylococcus aureus* were reported from football teams. Active surveillance among the members of each team was done along with increased equipment and environmental cleaning.

During the month of September, two outbreaks of impetigo were reported from schools. In both outbreaks, cases were clinically diagnosed. No laboratory confirmation was performed in either outbreak. Impetigo is a common, superficial bacterial infection, primarily caused by *Staphylococcus aureus*. Although most infections are mild, outbreaks may have a considerable negative impact because infected students may not be allowed to attend schools and daycares.

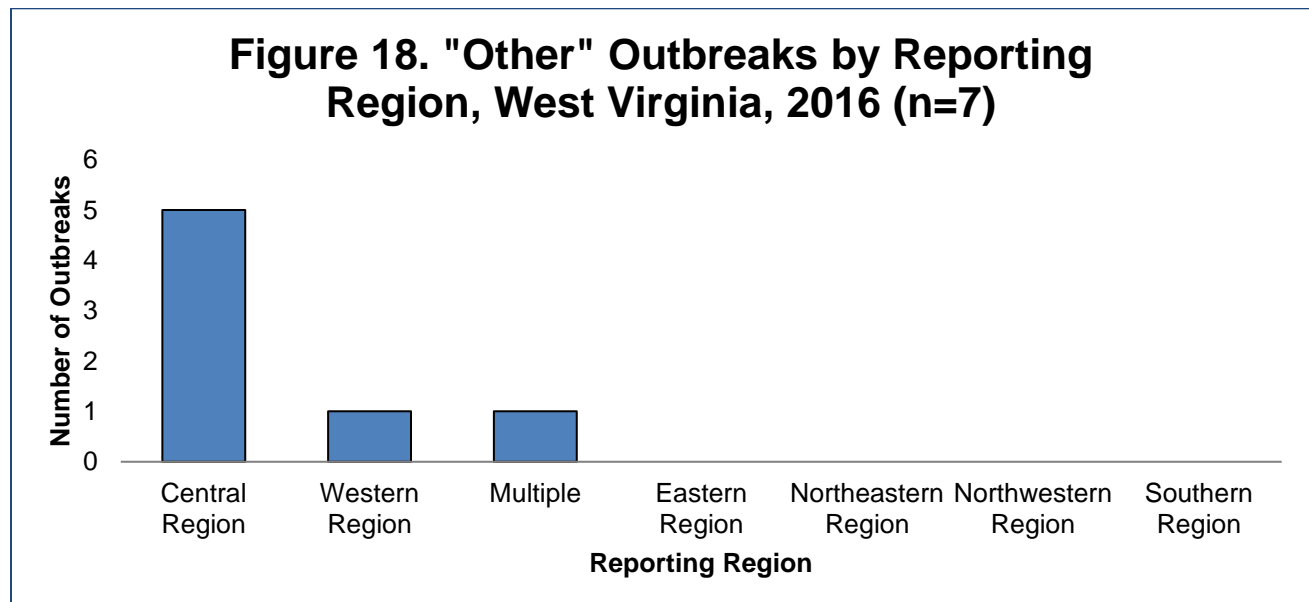
One outbreak of herpes gladiatorum was identified in a high school wrestling team. Three cases were diagnosed clinically and one was confirmed by PCR. Active surveillance among the team member and other wrestling teams revealed no additional cases.

In February, a varicella (chickenpox) outbreak was reported in a high school. Three students were clinically diagnosed with varicella. One case was laboratory confirmed by PCR. Two cases had only one dose of varicella vaccine and the third case was unvaccinated. No additional cases were identified.

Four outbreaks are listed as undifferentiated rash illness. Two of those outbreaks were in daycares and two are among members of sports teams. In all four outbreaks, no physician diagnosis was made nor laboratory testing performed. In an outbreak situation, physicians are strongly encouraged to perform appropriate laboratory testing when skin infection is suspected as the results can influence the treatment and management of such outbreaks.

“Other” Outbreaks, West Virginia, 2016 (n=6)

In 2016, there were seven (3.5%) outbreaks categorized as “Other.” Six outbreaks were reported by three (5%) counties from two surveillance regions, and one outbreak involved multiple regions (Figure 18).



Outbreaks categorized as “Other” outbreaks included six outbreaks of conjunctivitis and one outbreak of travel-associated febrile illness.

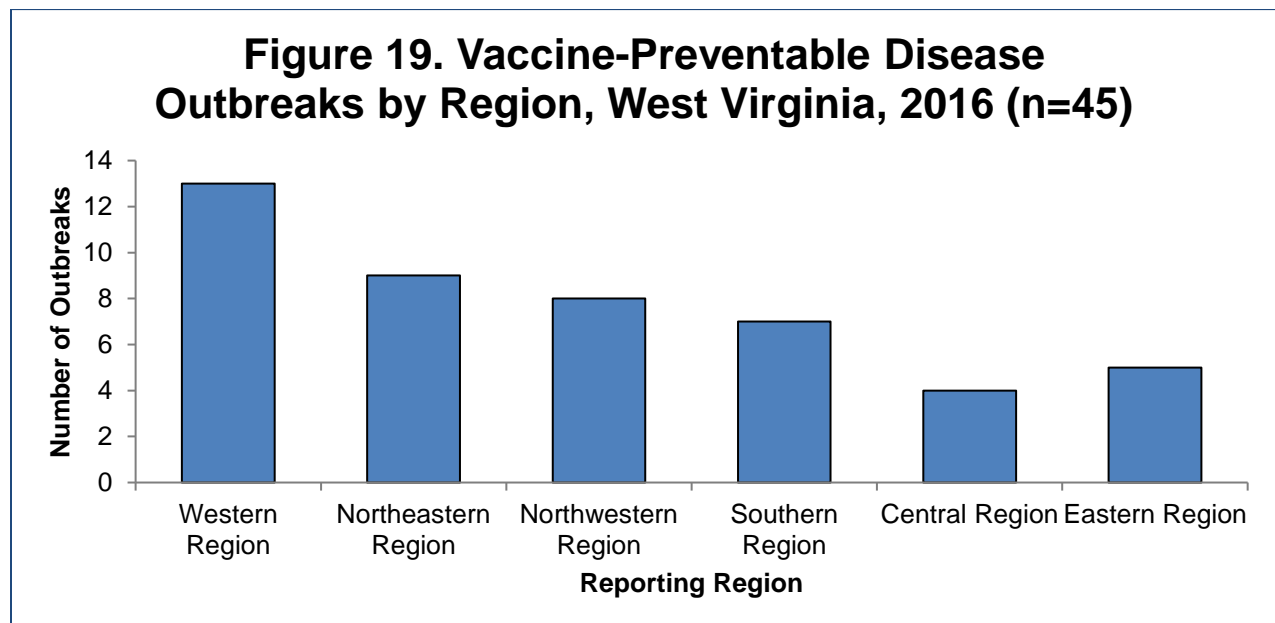
Six outbreaks of conjunctivitis were reported in 2016. Two outbreaks were reported from daycares, two from LTCFs, one from a school and one from a residential facility. All six outbreaks were clinically diagnosed and did not have laboratory confirmation.

Conjunctivitis outbreaks in schools or daycares are not uncommon and can be caused by viral or bacterial infection. CDC recommends that infected children be allowed in school if effective treatment is implemented, as long as the child does not have systemic signs of illness. However, infected students should be excluded from school if their behavior is such that close contact with other students cannot be avoided. Frequent hand hygiene and increased environmental cleaning of commonly touched surfaces should be encouraged.

One outbreak of travel-associated febrile illness was reported among a group of 11 travelers who traveled to a Caribbean country. Five of the 11 reported becoming ill after returning home. The most common symptoms reported were conjunctivitis, rash, myalgia, and arthralgia. All five travelers who reported symptoms were tested for Zika virus in collaboration with the Centers for Disease Control and Prevention (CDC). All five travelers tested positive, none of the travelers required hospitalization and all made a full recovery.

Vaccine-Preventable Disease Outbreaks (VPDOs)

In 2016, 46 (23%) vaccine-preventable disease outbreaks were reported from 26 counties (47%) in all surveillance regions (Figure 19).



Influenza outbreaks were the most common VPDOs (43, 93%) followed by hepatitis A (2, 4%), and varicella (1, 2%) (Table 24).

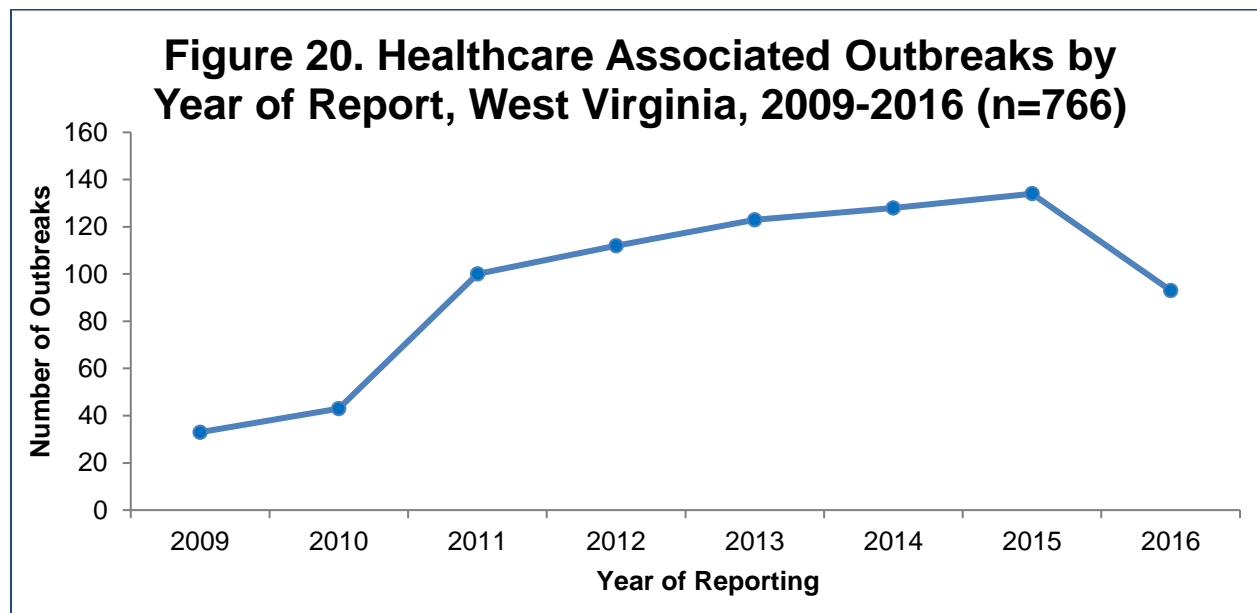
Table 24. Vaccine-Preventable Disease Outbreaks by Etiologic Agent/Clinical Syndrome, West Virginia, 2015

Clinical Syndrome/Etiologic Agent	Number of Outbreaks n=46	Percent
Influenza	43	94
Hepatitis A	2	4
Varicella	1	2

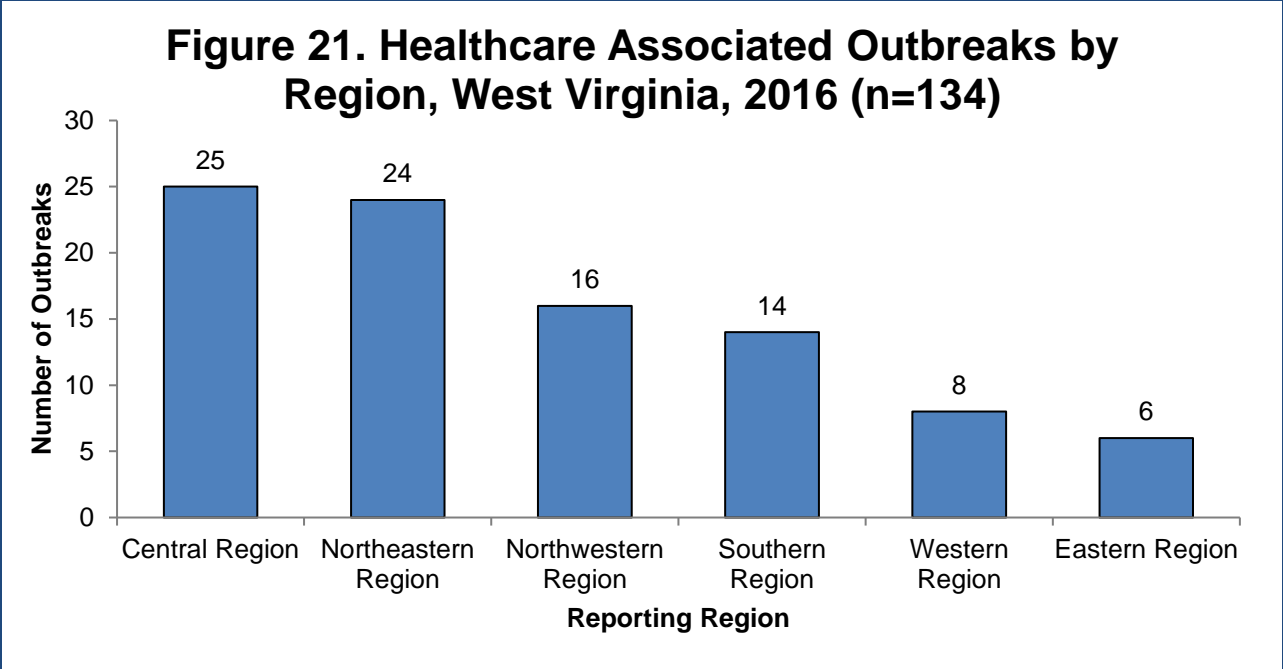
Influenza is described in the respiratory disease section of this report, hepatitis A outbreaks are described in the enteric disease section, and the varicella outbreak is described in the rash section.

Healthcare Associated Outbreaks (HAOs)

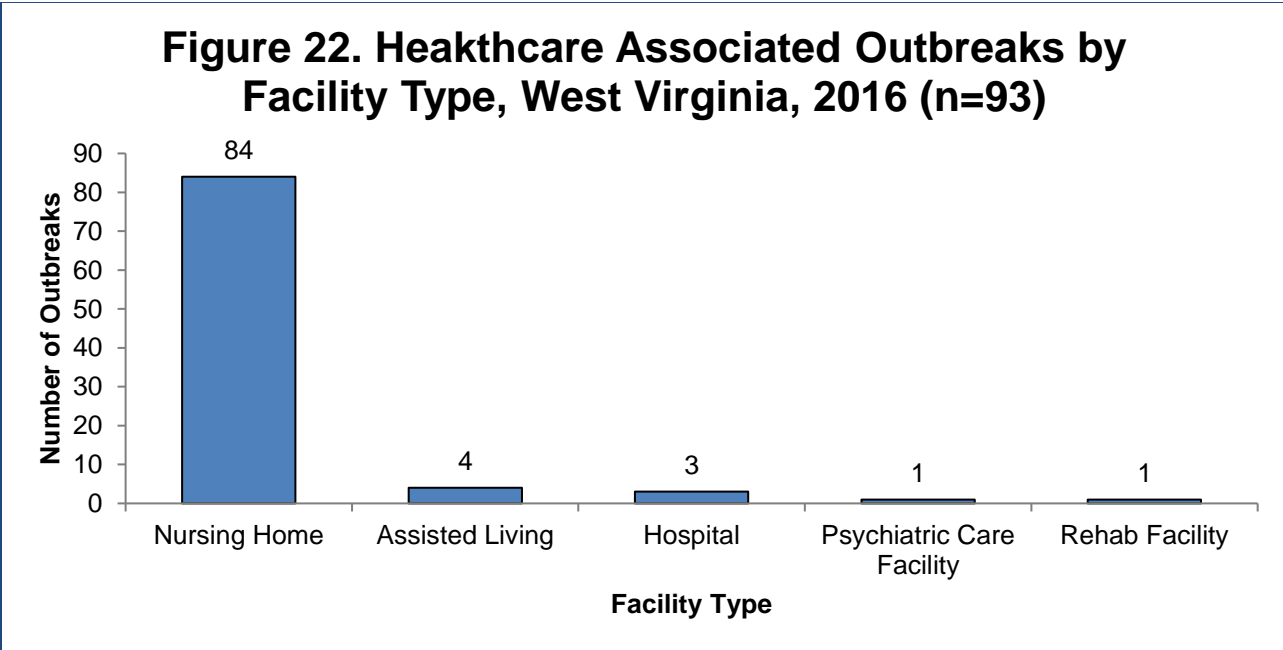
The number of HAOs reported in West Virginia has increased nearly triple from 2009 to 2016 (Figure 20). HAOs are defined as the occurrence of cases of a disease or illness above the expected or baseline level, over a given period of time, as a result of being in a healthcare facility or receiving healthcare-associated products or procedures.



In 2016, 93 HAOs were reported from 33 (60%) counties in all surveillance regions (Figure 21). HAOs accounted for 46% of all confirmed outbreaks in West Virginia.



The majority of HAOs were reported in LTCFs (84, 90%), followed by ALFs (4, 4%) hospitals (3, 3%), a psychiatric care facility (1, 1%) and a rehabilitation facility (1, 1%) (Figure 22).

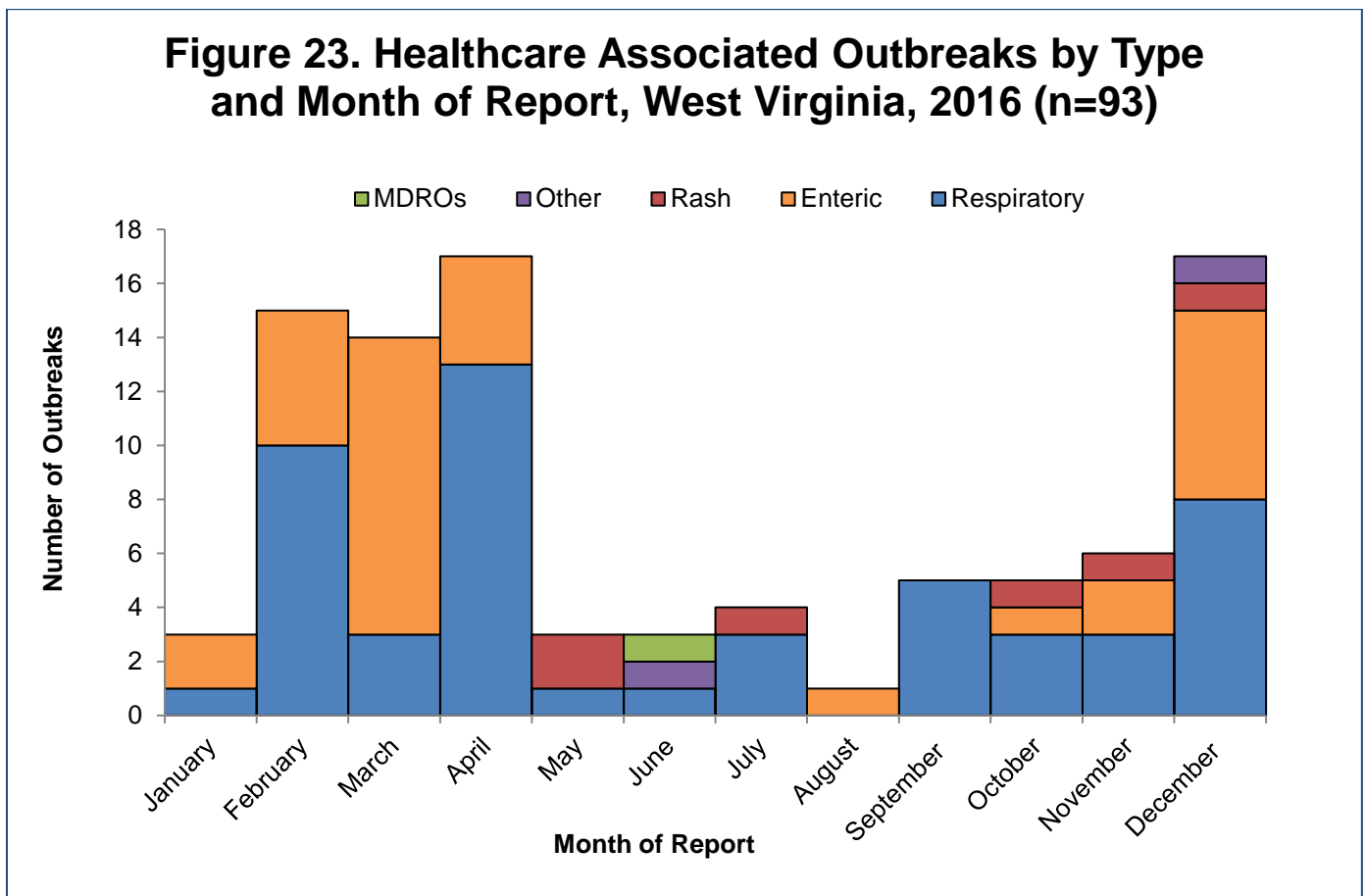


Respiratory disease outbreaks accounted for the majority of HAOs (55%) followed by enteric disease outbreaks (35%), rash illness outbreaks (7%), other outbreaks (2%), and MDRO outbreaks (1%) (Table 25).

Table 25. Healthcare Associated Outbreaks by Type of Outbreak, West Virginia, 2016

Outbreak Type	Number of Outbreaks (n=134)	Percent
Respiratory	51	55
Enteric	33	35
Rash	6	7
Other	2	2
MDROs	1	1

As observed in previous years, a seasonal trend was observed in 2016 showing an increase in HAOs during the colder months of the year. This can be attributed to increased circulation of influenza virus and norovirus during this time of the year (Figure 23).



Healthcare Associated Respiratory Disease Outbreaks:

Respiratory disease outbreaks (51, 55%) were the most common disease outbreak type reported in healthcare facilities. The majority of healthcare associated respiratory disease outbreaks were acute respiratory illness followed by influenza viruses. Table 26 depicts

healthcare associated respiratory illness outbreaks by etiologic agents and/or clinical syndrome.

The majority of healthcare associated respiratory outbreaks were reported in LTCFs (45, 88%), followed by hospitals (4, 8%), ALF (1, 2%) and a rehabilitation center (1, 2%) (Table 27). Details on healthcare associated respiratory disease outbreaks are discussed in the Respiratory Disease Outbreaks Section.

Table 26. Healthcare Associated Respiratory Disease Outbreaks by Clinical Syndrome/Etiologic Agent, West Virginia, 2016

Clinical Syndrome/Etiologic Agent	Number of outbreaks (n=51)	Percent
Undetermined	10	20
Influenza	7	13
Influenza A	6	12
Rhinovirus/Enterovirus	4	8
Influenza A H3	3	6
Influenza B	3	6
Human Metapneumovirus	2	4
Respiratory Syncytial Virus (RSV)	2	4
Coronavirus, Entero/rhinovirus	1	2
Coronavirus, Metapneumovirus	1	2
Human Metapneumovirus and Entero/Rhinovirus	1	2
Influenza A and B	1	2
Influenza A and RSV	1	2
Influenza A H1N1	1	2
Influenza A H1N1 and B and RSV	1	2
Influenza A H3, Parainfluenza, Entero/Rhinovirus	1	2
Influenza B and Entero/Rhinovirus	1	2
Influenza A and Coronavirus	1	2
Picornavirus	1	2
Pseudomonas aeruginosa	1	2
Respiratory Syncytial Virus (RSV)	1	2
RSV, Metapneumovirus, Entero/Rhinovirus and Coronavirus	1	2

Table 27. Healthcare Associated Respiratory Disease Outbreaks by Transmission Setting, West Virginia, 2016

Transmission Setting	Number of Outbreaks (n=51)	Percent
LTCFs	45	88
Hospital	4	8
Rehabilitation Center	1	2
ALF	1	2

Healthcare Associated Enteric Disease Outbreaks:

Enteric disease outbreaks (33, 35%) were the second most common disease outbreak type reported in healthcare facilities in 2016. The majority of healthcare associated enteric disease outbreaks were acute gastroenteritis followed by norovirus gastroenteritis (Table 28).

Table 28. Healthcare Associated Enteric Disease Outbreaks by Clinical Syndrome/Etiologic Agent, West Virginia, 2016

Clinical Diagnosis/Etiologic Agent	Number of Outbreaks (n=33)	Percent
Acute Gastroenteritis	25	76
Norovirus G II	7	21
Sapovirus Gastroenteritis	1	3

Most enteric disease outbreaks were reported in LTCFs (30, 91%) followed by ALFs (3, 9%). (Table 29).

Table 29. Healthcare Associated Enteric Disease Outbreaks by Transmission Settings, West Virginia, 2016

Transmission Settings	Number of Outbreaks (n=33)	Percent
LTCFs	30	91
ALFs	3	9

Acute gastroenteritis and norovirus outbreaks are described in detail under the enteric disease outbreak section.

Healthcare Associated Rash Illness Outbreaks:

There were 6 (7%) rash illness outbreaks reported from healthcare facilities in 2016. All rash illness outbreaks were scabies infections reported from LTCFs. Two outbreaks were laboratory confirmed with skin scrapings and the remaining four were confirmed by clinical diagnosis.

Other Healthcare Associated Outbreaks:

In 2016, there were two outbreaks of healthcare associated conjunctivitis were reported. Both were reported from LTCFs and were confirmed by clinical diagnosis without laboratory testing.

Healthcare Associated Multidrug-Resistant Organism (MDRO) Outbreaks

MDROs are defined as microorganisms, predominantly bacteria, that are resistant to one or more classes of antimicrobial agents. MDRO outbreaks are defined as an increase in the number of infections with MDROs beyond the endemic level (baseline level) in a facility/unit over a specific period of time. MDROs represent a major public health threat in the United States and West Virginia. These bacteria can spread rapidly and are associated with high morbidity and mortality rates due to limited options for treatment.

In 2016, there was one MDRO outbreak reported from a LTCF. Extended-spectrum beta-lactamase (ESBL) producing *Escherichia coli* (*E. coli*) was identified in the urine of seven residents. A site visit was conducted by DIDE and the LHD to review infection control practices and provide recommendations to the facility. Education was provided on monitoring hand hygiene compliance, environmental cleaning, and adherence to contact precautions. No additional cases were identified.

Findings and Recommendations

In 2016, outbreak recognition and reporting has continued to improve as seen over the last several years. This improvement can be attributable to strengthened public health infrastructure, increased awareness among healthcare providers and public health staff. Despite this progress, there are still opportunities for improvement. The following summarizes the findings of this report and provides recommendations.

Findings and Recommendations for LHDs:

1. According to the West Virginia Reportable Disease Rule, outbreaks are immediately reportable in West Virginia to LHDs regardless of outbreak setting.
2. In 2016, of the 55 West Virginia counties, 47 (85%) reported outbreaks. This represents improvement over the previous years. DIDE encourages LHDs to continue to strengthen relationships and maintain an open dialogue with healthcare facilities and other institutions and their staff particularly, infection preventionists (IPs), and school nurses.

3. The range of the number of outbreaks reported among different surveillance regions in 2016 was 22 to 50 outbreaks, even though there are similar numbers of healthcare facilities and schools in each surveillance region. DIDE encourages LHDs, with assistance from regional epidemiologists, to provide regular trainings on outbreak identification and reporting to stakeholders.
4. In 2016, 174 (87%) outbreaks were reported to DIDE within one hour, and 195 (97%) were reported within 24 hours. LHDs are required to report 100% of outbreaks to DIDE within one hour. Immediate reporting improves the outbreak response by facilitating laboratory testing for diagnosis, implementing control measures in a timely manner, and preventing further illnesses or deaths. It also facilitates communication with the CDC and other partners on critical health issues.
5. LHDs should consult with the regional epidemiologists in outbreak investigations.
6. DIDE recommends using disease-specific outbreak toolkits. DIDE has developed several outbreak toolkits for the most commonly encountered outbreaks. Toolkits can be accessed online at:
<http://www.dhhr.wv.gov/oeps/disease/ob/Pages/OutbreakToolkits.aspx>
7. As a requirement for threat preparedness funding, the LHDs are required to complete a final outbreak report for each outbreak. Consider using outbreak specific templates provided by DIDE. Templates can be accessed at:
<http://www.dhhr.wv.gov/oeps/disease/ob/pages/outbreakfinalreports.aspx>
8. Outbreak reports should be shared with DIDE and other stakeholders within 30 days of closing the outbreak. The purpose of these final reports is to assist facilities in identifying and mitigating gaps in outbreak response and infection control to prevent similar outbreaks from occurring in the future.
9. In 2016, there were 38 confirmed influenza outbreaks representing 51% of the confirmed respiratory outbreaks. LHDs should be prepared for influenza outbreaks in schools and LTCFs. Consider the following recommendations:
 - Recruit and maintain a functional sentinel provider.
 - Identify a healthcare provider/facility to assist in collecting specimens from schools in outbreak situations.
 - Influenza vaccination is the best preventive measure.
 - Keep a minimum of five unexpired influenza testing kits in the health department throughout the year.
 - Consider communicating with and educating school nurses and LTCFs IPs about influenza during the pre-influenza season.
10. LHDs and regional epidemiologists should share DIDE's monthly outbreak report with partners in a timely manner.
11. The role of laboratory testing is crucial in outbreak management. Timely collection of specimens facilitates diagnosis and institution of control measures. One of the

outbreak performance measures for LHDs is to attempt to collect appropriate specimens during at least 90% of reported respiratory disease outbreaks and 100% of reported foodborne outbreaks. LHDs should consider assisting healthcare facilities with testing at West Virginia Office of Laboratory Services (WVOLS) during routine enteric outbreaks to direct infection control measures and maintain ongoing surveillance.

Findings and Recommendations for LTCFs:

1. Outbreaks should be reported immediately to LHDs according to the West Virginia Reportable Disease Rule.
2. LTCFs continue to account for the majority of outbreaks (88, 44%) reported in the State. These outbreaks are occasionally severe and associated with high morbidity and mortality. LTCFs should dedicate, train, and maintain a designated IP in the facility at all times. This will be a Centers for Medicare and Medicaid Services (CMS) requirement beginning in 2018.
3. LTCFs should maintain an open dialogue with their LHD and regional epidemiologist. Consider contacting your LHD after hiring a new IP for orientation on reportable diseases and outbreaks.
4. Provide facility-wide education on hand hygiene and transmission based precaution. Routinely monitor for compliance. Useful resources can be found at: <http://www.dhhr.wv.gov/oeps/disease/HAI/Pages/default.aspx>
5. Provide facility-wide education on antimicrobial resistance and appropriate use at least once a year. DIDE is available to assist with materials to facilitate this training.
6. For influenza and other respiratory outbreaks:
 - a. Use the disease specific outbreak toolkits available online at: <http://www.dhhr.wv.gov/oeps/disease/ob/Pages/OutbreakToolkits.aspx>
 - b. Maintain standing orders for influenza vaccination, testing, and prophylaxis.
 - c. Laboratory testing is crucial for management of respiratory outbreaks. WVOLS can provide testing at no charge during outbreaks.

Findings and Recommendations for Acute Care Hospitals and Outpatient Clinics:

1. Outbreaks should be reported immediately to LHDs according to the West Virginia Reportable Disease Rule. In 2016, there were only four outbreaks reported from acute care facilities. Facilities should educate their providers and staff on outbreak recognition and reporting.
2. Maintain an open dialogue with their LHD and regional epidemiologist.

3. DIDE can provide assistance, expertise, and laboratory support, if needed, to investigate outbreaks in acute care facilities. DIDE also works closely with the CDC in investigating complicated HAOs.
4. Refer to DIDE's healthcare associated outbreak protocol on the website at: <http://www.dhhr.wv.gov/oeps/disease/hai/documents/hai-protocol.pdf>
5. Develop a multidisciplinary approach for outbreak investigations.
6. Maintain an up-to-date vaccination record, including influenza, of all healthcare workers, including those who are not employed by but have privileges in the facility.
7. Provide routine education on appropriate infection control practices, including hand hygiene and transmission-based precautions and monitor for compliance.
8. Provide facility-wide education on safe injection practice, antimicrobial resistance, and appropriate antibiotics use at least once a year.

DIDE's Objectives:

The following are objectives ongoing and new objectives for 2017 and beyond:

1. DIDE continues to provide feedback on outbreaks and outbreak investigations. In addition to the yearly outbreak report, DIDE continues to release a monthly outbreak report. The monthly reports are also posted on the website at: <http://www.dhhr.wv.gov/oeps/disease/ob/Pages/default.aspx>
2. DIDE will continue to participate in electronic reporting of all enteric outbreaks in the National Outbreak Reporting System (NORS).
3. DIDE will work closely with the regional epidemiologists to assist underreporting regions and counties to identify their training needs and provide training as necessary.
4. DIDE will conduct evaluation of the foodborne outbreak response and management at the state level including epidemiology, environmental and laboratory programs using the Council to Improve Foodborne Outbreak Response (CIFOR) guidelines.
5. Healthcare associated outbreaks:
 - According to the CDC, West Virginia continues to be among the states with the highest antibiotic prescribing rates. DIDE has been and will continue to work with the CDC to provide education and training materials on antimicrobial resistance and appropriate use.
 - The findings from this report will be presented to the Healthcare Associated Infections (HAI) Multidisciplinary Advisory Group as well as WV Association

for Professionals in Infection Control and Epidemiology (APIC) state chapter as a part of an annual needs assessment.

- DIDE continues to make resources available for state and regional epidemiologists to attend national trainings and conferences in HAIs and HAOs.
- DIDE will continue to provide annual carbapenem-resistant Enterobacteriaceae (CRE) surveillance reports.

Appendix: Summary of Confirmed Outbreaks, 2016, West Virginia (n=201)

Outbreak Number	Date & Time Reported to LHD	Date & Time Reported to State	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic	Final Case Count	Labs	Transmission	Modes of Transmission or Source of Illness
2	1/11/16 3:25 PM	1/11/16 3:30 PM	5	Northeastern Region	WV	Acute Gastroenteritis	Undetermined	Residents 6/120 (AR 5%) Staff 6/110 (AR 5%)	Lab test not done	Nursing Home	Person to Person
3	1/15/16 8:00 AM	1/15/16 8:30 AM	30	Northeastern Region	WV	Acute Respiratory Syndrome	Respiratory Syncytial Virus (RSV)	Attendees 12/93 (AR 13%) Staff 1/26 (AR 4%)	Lab Confirmed	Daycare	Person to Person
4	1/20/16 3:00 PM	1/20/16 4:00 PM	60	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 3/62 (AR 5%)	Lab test not done	Nursing Home	Person to Person
6	1/28/16 10:00 AM	1/28/16 10:20 AM	20	Northeastern Region	WV	Influenza	Influenza	Residents 15/105 (AR 14%) Staff 5/117 (AR 4%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
7	2/3/16 4:00 PM	2/4/16 11:00 AM	1140	Western Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 11/86 (AR 13%)	Lab test not done	Nursing Home	Person to Person
8	2/5/16 9:00 AM	2/5/16 2:00 PM	300	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 44/100 (AR 44%) Staff 25/100 (AR 25%)	Lab test not done	Nursing Home	Person to Person
9	2/5/16 11:30 AM	2/5/16 12:05 PM	35	Northwestern Region	WV	Varicella	Varicella zoster virus	Students 3/1088 (AR 0.3%)	Lab Confirmed	School	Person to Person
10	2/5/16 2:00 PM	2/5/16 2:15 PM	15	Multiple	WV	Travel Associated Febrile Illness	Zika virus	Cases 5	Lab Confirmed	Community	Other
11	2/9/16 12:05 PM	2/9/16 12:12 PM	7	Western Region	WV	Acute Respiratory Syndrome	Respiratory Syncytial Virus (RSV)	Patients 7/19 (AR 37%)	Lab Confirmed	Hospital	Person to Person
12	2/11/16 11:45 AM	2/11/16 12:00 PM	15	Northeastern Region	WV	Acute Gastroenteritis	Undetermined	Residents 20/38 (AR 53%) Staff 6/28 (AR 21%)	Lab test not done	Nursing Home	Person to Person
13	2/12/16 10:00 AM	2/12/16 10:22 AM	22	Southern Region	WV	Acute Respiratory Syndrome	RSV, Metapneumovirus, Entero/Rhinovirus and Coronavirus	Residents 26/60 (AR 43%) Staff 1/80 (AR 1%)	Lab Confirmed	Nursing Home	Person to Person
14	2/12/16 3:30 PM	2/12/16 4:08 PM	38	Central Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 9/86 (AR 10%)	Lab test not done	Nursing Home	Person to Person

Outbreak Number	Date & Time Reported to LHD	Date & Time Reported to State	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic	Final Case Count	Labs	Transmission	Modes of Transmission or Source of Illness
15	2/17/16 11:30 AM	2/17/16 11:20 AM	10	Eastern Region	Other State	Campylobacteriosis	Campylobacter lari	Cases WV 1, National 12	Lab Confirmed	Community	Foodborne
16	2/17/16 2:00 PM	2/17/16 2:30 PM	30	Northeastern Region	WV	Influenza	Influenza A H1N1	Residents 3/23 (AR 13%) Staff 1	Lab Confirmed	Nursing Home	Person to Person
17	2/17/16 2:15 PM	2/17/16 2:45 PM	30	Central Region	WV	Acute Respiratory Syndrome	Coronavirus, Metapneumovirus	Residents 24/94 (AR 26%)	Lab Confirmed	Nursing Home	Person to Person
18	2/17/16 2:00 PM	2/17/16 2:26 PM	26	Western Region	WV	Conjunctivitis	Undetermined	Attendees 6/120 (AR 5%)	Lab test not done	Daycare	Person to Person
19	2/18/16 9:20 AM	2/18/16 9:28 AM	8	Northeastern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 20/94 (AR 21%) Staff 1	Lab test negative or noncontributory	Nursing Home	Person to Person
20	2/18/16 12:00 PM	2/18/16 12:39 PM	39	Eastern Region	WV	Norovirus Gastroenteritis	Norovirus GI and GII	Residents 43/62 (AR 69%) Staff 20/83 (AR 24%)	Lab Confirmed	Nursing Home	Person to Person
21	2/22/16 1:30 PM	2/22/16 1:10 PM	20	Eastern Region	CDC/ Multi-state	Salmonellosis	<i>Salmonella Virchow</i>	Cases WV 1, National 33	Lab Confirmed	Community	Point Source
22	2/22/16 12:00 PM	2/23/16 12:30 PM	1470	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 13/110 (AR 12%) Staff 3/140 (AR 2%)	Lab test not done	Nursing Home	Person to Person
23	2/24/16 11:13 AM	2/24/16 11:20 AM	7	Western Region	WV	Acute Respiratory Syndrome	Human Metapneumovirus	Residents 20/60 (AR 33%) Staff 1	Lab Confirmed	Nursing Home	Person to Person
24	2/24/16 1:25 PM	2/24/16 2:14 PM	49	Central Region	WV	Acute Respiratory Syndrome	Respiratory Syncytial Virus (RSV)	Residents 16/123 (AR 13%)	Lab Confirmed	Nursing Home	Person to Person
25	2/25/16 9:00 AM	2/25/16 9:15 AM	15	Southern Region	WV	Acute Respiratory Syndrome	Human Metapneumovirus and Enterovirus/Rhinovirus	Residents 22/80 (AR 28%)	Lab Confirmed	Nursing Home	Person to Person
26	2/25/16 9:25 AM	2/25/16 10:10 AM	45	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 16/47 (AR 34%)	Lab test not done	Daycare	Person to Person
27	2/25/16 3:10 PM	2/25/16 3:20 PM	10	Eastern Region	WV	Acute Gastroenteritis	Undetermined	Highest Absentee Rate 18%	Lab test not done	School	Person to Person

Outbreak Number	Date & Time Reported to LHD	Date & Time Reported to State	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic	Final Case Count	Labs	Transmission	Modes of Transmission or Source of Illness
28	2/29/16 3:00 PM	2/29/16 3:25 PM	25	Northeastern Region	WV	Acute Gastroenteritis	Undetermined	Residents 18/52 (AR 35%)	Lab test not done	Nursing Home	Person to Person
30	3/2/16 10:30 AM	3/2/16 11:10 AM	40	Western Region	WV	Influenza	Influenza A H1N1	Highest Absentee Rate 16%	Lab Confirmed	School	Person to Person
31	3/2/16 1:45 PM	3/2/16 1:45 PM	0	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Students 41/118 (AR 35%) staff 4/16 (AR 25%)	Lab test not done	School	Undetermined
32	3/3/16 8:30 AM	3/3/16 8:50 AM	20	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents 1/86 (AR 1%) Staff 4/66 (AR 6%)	Lab test not done	Nursing Home	Person to Person
33	3/3/16 9:20 AM	3/3/16 9:30 AM	10	Northeastern Region	WV	Influenza	Influenza B	Residents 12/37 (AR 32%) Staff 3/28 (AR 10%)	Lab Confirmed	Nursing Home	Person to Person
34	3/4/16 11:00 AM	3/4/16 11:45 AM	45	Western Region	WV	Influenza	Influenza A	Attendees 9/41 (AR 22%)	Rapid test positive but not culture confirmed	Daycare	Person to Person
35	3/4/16 11:00 AM	3/4/16 11:45 AM	45	Western Region	WV	Influenza	Influenza A	Highest Absentee Rate 16%	Rapid test positive but not culture confirmed	School	Person to Person
36	3/4/16 2:20 PM	3/4/16 2:32 PM	12	Western Region	WV	Influenza	Influenza	Highest Absentee Rate 14%	Rapid test positive but not culture confirmed	School	Person to Person
38	3/4/16 4:00 PM	3/4/16 4:00 PM	0	Eastern Region	WV	Vibriosis	<i>Vibrio cholerae</i>	One Case	Lab Confirmed	Community	Undetermined
39	3/7/16 1:00 PM	3/7/16 1:18 PM	18	Northwestern Region	WV	Influenza	Influenza	Students 62/356 (AR 17%)	Rapid test positive but not culture confirmed	School	Person to Person
40	3/7/16 1:00 PM	3/7/16 1:18 PM	18	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 24/61 (AR 39%) Staff 5/51 (AR 10%)	Lab test not done	Assisted Living	Person to Person
41	3/7/16 2:00 PM	3/7/16 2:12 PM	12	Eastern Region	WV	Acute Gastroenteritis	Undetermined	Residents 22/104 (AR 21%) and staff 7/145 (AR 5%).	Lab test not done	Nursing Home	Person to Person
42	3/8/16 9:20 AM	3/8/16 9:30 AM	10	Northwestern Region	WV	Herpes Gladiatorum	Herpes Gladiatorum	Cases 3	Lab Confirmed	School	Person to Person
43	3/8/16 12:26 PM	3/8/16 12:26 PM	0	Multiple	WV	Acute Gastroenteritis	Undetermined	Cases 6	Lab test not done	Other	Undetermined

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44	3/8/16 3:30 PM	3/8/16 4:00 PM	30	Northeastern Region	WV	Influenza	Influenza B	Attendees 9/75 (AR 12%) Staff 7/40 (AR 18%)	Rapid test positive but not culture confirmed	Daycare	Person to Person
45	3/10/16 8:17 AM	3/10/16 8:47 AM	30	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 29/61 (AR 48%) Staff 6/82 (AR 7%)	Lab test not done	Nursing Home	Person to Person
46	3/10/16 1:19 PM	3/10/16 1:31 PM	12	Northwestern Region	WV	Undifferentiated Rash Illness	Undetermined	Cases 3	Lab test not done	Sports Team	Person to Person
47	3/11/16 9:00 AM	3/11/16 9:10 AM	10	Western Region	WV	Influenza	Influenza A	Attendees 9/20 (AR 45%)	Rapid test positive but not culture confirmed	Daycare	Person to Person
48	3/11/16 10:33 AM	3/11/16 10:38 AM	5	Southern Region	WV	Norovirus Gastroenteritis	Norovirus GI	Residents 39/119 (AR 33%) Staff 25/140 (AR 18%)	Lab Confirmed	Nursing Home	Person to Person
49	3/11/16 11:47 AM	3/11/16 12:45 PM	58	Southern Region	WV	Acute Gastroenteritis	Undetermined	Residents 20/28 (AR 71%) Staff 14/38 (AR 37%)	Lab test negative or noncontributory	Nursing Home	Person to Person
51	3/14/16 12:28 PM	3/14/16 1:16 PM	48	Central Region	WV	Influenza	Influenza A	Attendees 9 Staff 5/38 (AR 13%)	Rapid test positive but not culture confirmed	Daycare	Person to Person
52	3/16/16 10:15 AM	3/16/16 10:42 AM	27	Southern Region	WV	Acute Gastroenteritis	Undetermined	Attendees 24/80 (AR 30%)	Lab test not done	Other	Foodborne
53	3/16/16 11:30 AM	3/16/16 1:50 AM	580	Northwestern Region	WV	Acute Respiratory Syndrome	Influenza B and Enterovirus	Residents 14/63 (AR 22%)	Lab Confirmed	Nursing Home	Person to Person
54	3/17/16 10:25 AM	3/17/16 10:40 AM	15	Central Region	WV	Influenza	Influenza A	Attendees 7/16 (AR 44%) Staff 1	Rapid test positive but not culture confirmed	Daycare	Person to Person
55	3/17/16 11:45 AM	3/17/16 1:00 PM	75	Southern Region	WV	Influenza	Influenza	Highest Absentee Rate 23%	Rapid test positive but not culture confirmed	School	Person to Person
56	3/17/16 4:15 PM	3/17/16 4:30 PM	15	Central Region	WV	Conjunctivitis	Undetermined	Attendees 18 Staff 3	Lab test not done	Daycare	Person to Person
57	3/18/16 8:30 AM	3/18/16 8:30 AM	0	Central Region	WV	Norovirus Gastroenteritis	Norovirus	Residents 4/51 (AR 8%) 1/100 (AR 1%)	Lab Confirmed	Nursing Home	Person to Person
58	3/22/16 8:45 AM	3/22/16 8:56 AM	11	Northwestern Region	WV	Influenza	Influenza	Students 6/229 (AR 3%)	Rapid test positive but not culture confirmed	School	Person to Person

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59	3/23/16 1:40 PM	3/23/16 2:00 PM	20	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents 14/84 (AR 18%) Staff 13/125 (AR 10%)	Lab test not done	Nursing Home	Person to Person
60	3/23/16 3:25 PM	3/23/16 4:15 PM	50	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents 6/62 (AR 16%) Staff 7/55 (AR 13%)	Lab test not done	Assisted Living	Person to Person
61	3/23/16 12:55 PM	3/23/16 1:12 PM	17	Northeastern Region	WV	Influenza	Influenza A and B	Residents 5/94 (AR5%) Staff 3/115 (AR 3%)	Lab Confirmed	Nursing Home	Person to Person
62	3/25/16 11:55 AM	3/25/16 11:55 AM	0	Western Region	WV	Salmonellosis	<i>Salmonella Enteritidis</i>	Cases 5	Lab Confirmed	Community	Animal Contact
63	3/28/16 2:30 PM	3/28/16 2:40 PM	10	Southern Region	WV	Acute Gastroenteritis	Undetermined	Residents 9/54 (AR 17%)	Lab test not done	Nursing Home	Person to Person
64	3/25/16 11:26 AM	3/25/16 11:15 AM	11	Southern Region	WV	Cryptosporiosis, Campylobacteriosis	Cryptosporidium and <i>Campylobacter</i>	Cases 4	Lab Confirmed	Community	Undetermined
65	3/29/16 11:15 AM	3/29/16 12:00 PM	45	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents 10/55 (AR 18%) Staff 9/85 (AR 11%)	Lab test not done	Nursing Home	Person to Person
66	4/1/16 8:40 AM	4/1/16 9:10 AM	30	Western Region	WV	Influenza	Influenza B	Residents 6/136 (AR 4%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
67	4/4/16 11:30 AM	4/4/16 12:30 PM	60	Northeastern Region	WV	Sapovirus Gastroenteritis	Sapovirus	Residents 39/59 (AR 66%) Staff 13/85 (AR 15%)	Lab Confirmed	Nursing Home	Person to Person
68	4/7/16 3:00 PM	4/7/16 3:30 PM	30	Southern Region	WV	Influenza	Influenza	Residents 3/168 (AR 2%) Staff 4/250 (AR 2%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
69	4/8/16 9:45 AM	4/8/16 9:45 AM	0	Southern Region	WV	Streptococcal Pharyngitis	Streptococcus pyogenes	Students 63/390 (AR 16%)	Rapid test positive but not culture confirmed	School	Person to Person
70	4/8/16 2:35 PM	4/8/16 3:20 PM	45	Eastern Region	WV	Influenza	Influenza B	Residents 4 Staff 2	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
71	4/11/16 10:15 AM	4/11/16 10:29 AM	14	Northeastern Region	WV	Influenza	Influenza A	Residents 16/37 (AR 43%) Staff 2/28 (AR 7%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
73	4/11/16 1:50 PM	4/11/16 2:30 PM	40	Northwestern Region	WV	Influenza	Influenza	Residents 9/52 (AR 17%) Staff 2/60 (AR 3%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person

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75	4/14/16 11:30 AM	4/14/16 11:48 AM	18	Eastern Region	WV	Influenza	Influenza A and B	Highest Absentee Rate 15%	Rapid test positive but not culture confirmed	School	Person to Person
76	4/14/16 1:29 PM	4/14/16 1:46 PM	17	Northwestern Region	WV	Acute Respiratory Syndrome	Influenza A H1N1 and B and RSV	Residents 21/98 (AR 21%) Staff 5/183 (AR 3%)	Lab Confirmed	Nursing Home	Person to Person
77	4/14/16 1:35 PM	4/14/16 1:50 PM	15	Central Region	WV	Conjunctivitis	Undetermined	Attendees 3/12 (AR 25%)	Lab test not done	School	Person to Person
78	4/14/16 3:30 PM	4/14/16 3:40 PM	10	Southern Region	WV	Influenza	Influenza A	Residents 8/91 (AR 9%) Staff 3/200 (AR 2%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
79	4/18/16 8:30 AM	4/18/16 8:43 AM	13	Central Region	WV	Norovirus Gastroenteritis	Norovirus	Residents 18/87 (AR 21%) Staff 15/100 (AR 15%)	Lab Confirmed	Nursing Home	Person to Person
80	4/18/16 3:45 PM	4/18/16 3:52 PM	7	Southern Region	WV	Influenza	Influenza	Residents 8/52 (AR 165%) Staff 6/60 (10%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
81	4/19/16 8:38 AM	4/19/16 8:50 AM	12	Southern Region	WV	Influenza	Influenza A H3	Patients 6/29 (AR 21%) Staff 5/128 (AR 4%)	Lab Confirmed	Rehab Facility	Person to Person
82	4/19/16 2:07 PM	4/19/16 2:37 PM	30	Northwestern Region	WV	Influenza	Influenza A	Residents 11/61 (AR 18%) Staff 2/80 (AR 3%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
83	4/20/16 11:00 AM	4/20/16 11:45 AM	45	Western Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 7/70 (AR 10%)	Lab test not done	Daycare	Person to Person
84	4/20/16 1:13 PM	4/20/16 3:45 PM	152	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents 13 Staff 4	Lab test not done	Nursing Home	Person to Person
85	4/20/16 3:30 PM	4/20/16 3:50 PM	20	Southern Region	WV	Influenza	Influenza	Residents 23/57 (AR 40%) Staff 18/74 (AR 24%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
86	4/21/16 11:50 AM	4/21/16 12:03 PM	13	Northwestern Region	WV	Influenza	Influenza A H1N1	Inmates 94/610 (AR 15%) Staff 11/200 (AR 6%)	Lab Confirmed	Correctional Facility	Person to Person
87	4/25/16 3:47 PM	4/25/16 3:56 PM	9	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents 8/23 (AR 35%) Staff 1/102 (AR 1%)	Lab test not done	Nursing Home	Person to Person
88	4/27/16 10:20 AM	4/27/16 10:30 AM	10	Northwestern Region	WV	Acute Respiratory Syndrome	Human Metapneumovirus	Residents 7/63 (AR 11%)	Lab Confirmed	Nursing Home	Person to Person

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89	4/27/16 11:30 AM	4/27/16 2:03 PM	153	Western Region	WV	Influenza	Influenza A	Residents 5/78 (AR 6%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
90	4/27/16 3:15 PM	4/27/16 4:00 PM	45	Multiple	CDC/ Multi-state	Salmonellosis	Salmonella (multiple types)	Cases WV 32, National 895	Lab Confirmed	Community	Animal Contact
91	4/27/16 10:25 AM	4/27/16 10:25 AM	0	Multiple	WV	Acute Respiratory Syndrome	Undetermined	Cases 8	Lab test not done	Workplace	Person to Person
92	4/28/16 8:30 AM	4/28/16 9:20 AM	50	Western Region	WV	Influenza	Influenza A	Highest absentees rate 63%	Rapid test positive but not culture confirmed	School	Person to Person
93	4/28/16 9:38 AM	4/28/16 9:53 AM	15	Western Region	WV	Influenza	Influenza A	Highest absentees rate 14%	Rapid test positive but not culture confirmed	School	Person to Person
95	5/2/16 1:38 PM	5/2/16 1:50 PM	12	Central Region	WV	Scabies	Undetermined	Residents 7/73 (AR 10%) Staff 6/85 (AR 7%)	Lab test not done	Nursing Home	Person to Person
96	5/2/16 3:45 PM	5/2/16 4:12 PM	27	Central Region	WV	Streptococcal Pharyngitis	Streptococcus pyogenes	Attendees: 7/285 (AR 3%)	Rapid test positive but not culture confirmed	Daycare	Person to Person
98	5/5/16 4:05 PM	5/5/16 4:15 PM	10	Northeastern Region	WV	Scabies	Undetermined	Residents 9/36 (AR 25%) Staff 10/40 (AR 25%)	Lab test not done	Nursing Home	Person to Person
99	5/9/16 3:10 PM	5/9/16 3:20 PM	10	Central Region	WV	Influenza	Influenza B	Residents 2/3 (AR 67%) Staff 3/8 (AR 38%)	Rapid test positive but not culture confirmed	Hospital	Person to Person
100	5/11/16 12:00 PM	5/11/16 12:51 PM	51	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 10/68 (AR 15%)	Lab test not done	School	Person to Person
102	5/16/16 10:08 AM	5/16/16 10:13 AM	5	Southern Region	WV	Influenza	Influenza A	Residents 35	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
104	5/18/16 9:40 AM	5/17/16 5:30 PM	970	Northeastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 14/119 (AR 12%) Staff 2/32 (AR 6%)	Lab Confirmed	Daycare	Person to Person
105	5/23/16 9:37 AM	5/23/16 9:45 AM	8	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 12/285 (AR 4%)	Lab test not done	Daycare	Person to Person

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106	6/1/16 5:00 PM	6/2/16 1:55 PM	1255	Central Region	WV	Urinary Tract Infection	ESBL E. coli	Residents 7/72 (AR 10%)	Lab Confirmed	Nursing Home	Person to Person
107	6/7/16 4:00 PM	6/8/16 1:42 PM	1302	Central Region	WV	Acute Gastroenteritis	Undetermined	Patrons 13/22 (AR 59%)	Lab test not done	Other	Undetermined
108	6/10/16 2:40 PM	6/10/16 2:55 PM	15	Central Region	WV	Conjunctivitis	Undetermined	Attendees 3/243 (AR 1%)	Lab test not done	Other	Person to Person
109	6/11/16 9:00 AM	6/15/16 10:52 AM	5872	Northeastern Region	WV	Salmonellosis	Salmonella Miami	Cases 3	Lab Confirmed	Community	Foodborne
110	6/15/16 10:30 AM	6/15/16 10:52 AM	22	Northeastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 6	Lab test not done	Daycare	Person to Person
111	6/14/16 5:00 PM	6/23/16 9:05 AM	1248 5	Central Region	WV	Acute Respiratory Syndrome	Rhinovirus /Enterovirus	Residents 16/84 (AR 19%)	Lab Confirmed	Nursing Home	Person to Person
112	6/23/16 10:30 AM	6/23/16 10:40 AM	10	Central Region	WV	Undifferentiated Rash Illness	Undetermined	Attendees 6/51 (AR 12%)	Lab test not done	Daycare	Person to Person
113	6/28/16 8:45 AM	6/28/16 9:09 AM	24	Central Region	WV	Conjunctivitis	Undetermined	Residents 6/58 (AR 10%) Staff 1/80 (AR 1%)	Lab test not done	Nursing Home	Person to Person
114	7/5/16 8:10 AM	7/5/16 8:50 AM	40	Central Region	WV	Acute Respiratory Syndrome	Rhinovirus/ Enterovirus	Residents 10/56 (AR 18%) Staff 4/70 (AR 14%)	Lab Confirmed	Nursing Home	Person to Person
115	7/11/16 10:20 AM	7/11/16 11:12 AM	52	Northeastern Region	WV	Scabies	Undetermined	Residents 31/96 (AR 32%) Staff 14/110 (AR 13%)	Lab test negative or noncontributory	Nursing Home	Person to Person
116	7/12/16 3:00 PM	7/12/16 3:51 PM	51	Western Region	WV	Salmonellosis	Salmonella Enteritidis	Cases 5	Lab Confirmed	Community	Person to Person
117	7/14/16 12:00 PM	7/14/16 12:15 PM	15	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 12/35 (AR 34%)	Lab test not done	Daycare	Person to Person
118	7/14/16 4:35 PM	7/14/16 4:30 PM	5	Western Region	Other State	Shigellosis	Shigella	Cases WV 2, National 26	Lab Confirmed	Community	Waterborne
119	7/19/16 11:10 AM	7/19/16 11:25 AM	15	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 4/8 (AR 50%)	Lab test not done	Daycare	Person to Person
120	7/19/16 11:10 AM	7/19/16 11:30 AM	20	Western Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 7/70 (AR 10%)	Lab test not done	Daycare	Person to Person

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121	7/14/16 12:00 PM	7/20/16 10:40 AM	8560	Northwestern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents: 15/62 (AR 24%) Staff 10/60 (AR 17%)	Lab test not done	Nursing Home	Person to Person
122	7/27/16 9:30 AM	7/27/16 10:10 AM	40	Southern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 5/80 (AR 6%)	Lab test not done	Daycare	Person to Person
123	7/28/16 12:45 PM	7/28/16 1:28 PM	43	Northeastern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 12/112 (AR 11%)	Lab test not done	Nursing Home	Person to Person
124	7/30/16 5:00 PM	8/1/16 8:30 AM	2370	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents:13/93 (AR 14%)	Lab test not done	Nursing Home	Person to Person
125	8/2/16 11:25 AM	8/2/16 11:33 AM	8	Northeastern Region	WV	Scabies	Undetermined	Inmates 40/369 (AR 11%)	Lab test not done	Correctional Facility	Person to Person
126	8/4/16 9:00 AM	8/4/16 9:15 AM	15	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 6/62 (AR 10%)	Lab test not done	Daycare	Person to Person
127	8/5/16 11:45 AM	8/5/16 11:59 AM	14	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 5/32 (AR 17%)	Lab test not done	Daycare	Person to Person
128	8/9/16 8:45 AM	8/9/16 9:02 AM	17	Central Region	WV	Undifferentiated Rash Illness	Undetermined	Team members 10/37 (AR 27%)	Lab test not done	Sports Team	Person to Person
129	8/9/16 4:40 PM	8/9/16 4:50 PM	10	Northwestern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 11/35 (AR 31%)	Lab test not done	Daycare	Person to Person
131	8/16/16 3:00 PM	8/16/16 3:00 PM	0	Central Region	WV	Cryptosporidiosis	Cryptosporidium	Cases 9	Lab Confirmed	Community	Waterborne
132	8/18/16 10:15 AM	8/18/16 11:05 AM	50	Northwestern Region	WV	Scabies	Undetermined	Staff 2/10 (AR 20%)	Lab test not done	Other	Person to Person
133	8/25/16 1:28 PM	8/25/16 1:28 PM	0	Eastern Region	CDC/ Multi-state	Hepatitis A	Hepatitis A Virus	Cases WV 7, National 143	Lab Confirmed	Community	Person to Person
134	8/10/16 12:00 PM	8/10/16 8:46 AM	194	Eastern Region	CDC/ Multi-state	Salmonellosis	Salmonella Enteritidis	Case 28 nationwide, 1 in WV	Lab Confirmed	Community	Foodborne

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135	8/29/16 11:15 AM	8/29/16 11:20 AM	5	Southern Region	WV	Staphylococcus aureus Skin Infection	<i>Staphylococcus aureus</i>	Students 25	Lab Confirmed	Sports Team	Person to Person
136	9/1/16 11:08 AM	9/1/16 11:08 AM	0	Northeastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 29/419 (AR 7%)	Lab test not done	School	Person to Person
137	9/2/16 11:45 AM	9/2/16 12:00 PM	15	Northeastern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 19/98 (AR 19%) Staff 2/123 (AR 2%)	Lab test not done	Nursing Home	Person to Person
138	9/7/16 12:05 PM	9/7/16 12:23 PM	18	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 7/100 (AR 7%)	Lab test not done	Daycare	Person to Person
139	9/7/16 1:30 PM	9/7/16 1:47 PM	17	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 10299 (AR 3%)	Lab test not done	School	Person to Person
140	9/7/16 3:40 PM	9/7/16 3:51 PM	11	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 4/11 (AR 36%)	Lab test not done	Daycare	Person to Person
141	9/9/16 10:40 AM	9/9/16 10:52 AM	12	Eastern Region	WV	Impetigo	Undetermined	Students 6/235 (AR 3%)	Lab test not done	School	Person to Person
142	9/9/16 3:15 PM	9/9/16 3:50 PM	35	Northeastern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 6/43 (AR 14%), Staff 3/15 (AR 20%)	Lab test not done	Nursing Home	Person to Person
143	9/13/16 8:45 AM	9/13/16 9:37 AM	52	Southern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 4/65 (AR 6%)	Lab test not done	School	Person to Person
144	9/15/16 8:45 AM	9/15/16 10:00 AM	75	Northeastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 16/1700 (AR 1%) Staff 2/107 (2%)	Lab test not done	School	Person to Person
145	9/16/16 8:30 AM	9/16/16 8:35 AM	5	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 4/1318 (AR 0.3%)	Lab test not done	School	Person to Person
146	9/9/16 3:00 PM	9/14/16 3:30 PM	7230	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 3	Lab test not done	School	Person to Person
147	9/19/16 9:30 AM	9/19/16 10:30 AM	60	Eastern Region	WV	Impetigo	Undetermined	Students 8	Lab test negative or noncontributory	Sports Team	Person to Person
148	9/19/16 10:00 AM	9/19/16 10:00 AM	0	Central Region	WV	STEC Gastroenteritis	Shiga toxin-producing Escherichia coli (STEC)	Cases 3	Lab Confirmed	Community	Undetermined

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149	9/19/16 12:00 PM	9/19/16 4:04 PM	244	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 5	Lab test not done	School	Person to Person
150	9/20/16 9:00 AM	9/20/16 9:40 AM	40	Northwestern Region	WV	Staphylococcus aureus Skin Infection	<i>Staphylococcus aureus</i>	Team members 10/34 (AR 30%)	Lab Confirmed	Sports Team	Person to Person
152	9/20/16 11:30 AM	9/20/16 12:00 PM	30	Eastern Region	WV	Hand, Foot, and Mouth Disease	undetermined	Students 26/475 (AR 5%)	Lab test not done	School	Person to Person
154	9/20/16 3:20 PM	9/20/16 3:42 PM	22	Northwestern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 4/16 (25%)	Lab test not done	Daycare	Person to Person
155	9/20/16 1:30 PM	9/20/16 2:00 PM	30	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 4/155 (AR 3%)	Lab test not done	School	Person to Person
156	9/22/16 3:00 PM	9/22/16 3:30 PM	30	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 4/247 (AR 2%)	Lab test not done	School	Person to Person
157	9/22/16 3:00 PM	9/22/16 3:45 PM	45	Eastern Region	WV	Streptococcal Pharyngitis	<i>Streptococcus pyogenes</i>	Students 9/490 (AR 2%)	Rapid test positive but not culture confirmed	School	Person to Person
158	9/26/16 8:57 AM	9/26/16 9:10 AM	13	Northwestern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 32/96 (AR 33%) Staff 58/120 (AR 48%)	Lab test negative or noncontributory	Nursing Home	Person to Person
159	9/26/16 3:30 PM	9/26/16 3:00 PM	30	Eastern Region	CDC/ Multi-state	STEC Gastroenteritis	Shiga toxin-producing <i>Escherichia coli</i> (STEC)	Cases WV 1, National 11	Lab Confirmed	Community	Foodborne
160	9/26/16 3:30 PM	9/26/16 4:15 PM	45	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 3/153 (AR 2%)	Lab test not done	Daycare	Person to Person
161	9/27/16 2:00 PM	9/27/16 2:15 PM	15	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees 6/77 (AR 8%) Staff 2/18 (AR 11%)	Lab test not done	Daycare	Person to Person
162	9/27/16 3:15 PM	9/27/16 3:30 PM	15	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 5/479 (AR 1%)	Lab test not done	School	Person to Person
163	9/27/16 3:28 PM	9/27/16 3:38 PM	10	Central Region	WV	Acute Respiratory Syndrome	Rhinovirus/Enterovirus	Residents 19/85 (AR 22%)	Lab Confirmed	Nursing Home	Person to Person

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164	9/28/16 3:41 PM	9/28/16 3:50 PM	9	Northwestern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 40/750 (AR 5%)	Lab test not done	School	Person to Person
165	9/29/16 10:00 AM	9/29/16 10:10 AM	10	Central Region	WV	Pneumonia	Pseudomonas aeruginosa	Patients 6/16 (AR 38%)	Lab Confirmed	Hospital	Undetermined
166	9/29/16 1:33 PM	9/29/16 1:37 PM	4	Northwestern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 4/39 (AR 10%)	Lab test not done	Daycare	Person to Person
167	9/29/16 12:00 PM	9/29/16 1:35 PM	95	Northeastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 85/1100 (AR 8%)	Lab test not done	School	Person to Person
170	10/5/16 5:00 PM	10/5/16 9:30 AM	450	Northeastern Region	CDC/ Multi-state	Salmonellosis	Salmonella Agbeni	Cases WV 1, National 32	Lab Confirmed	Community	Foodborne
171	10/7/16 9:20 AM	10/7/16 9:30 AM	10	Southern Region	WV	Acute Gastroenteritis	Undetermined	Students 45/550 (AR 2%)	Lab test not done	School	Person to Person
172	10/7/16 9:14 PM	10/7/16 12:30 PM	524	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 11/1289 (AR 9%)	Lab test not done	School	Person to Person
173	10/7/16 11:00 AM	10/7/16 1:45 PM	165	Eastern Region	WV	Acute Respiratory Syndrome	Rhinovirus/Enterovirus	Residents 6/30 (AR 20%) Staff 1/29 (AR 3%)	Lab Confirmed	Nursing Home	Person to Person
174	10/11/16 9:00 AM	10/11/16 9:08 AM	8	Central Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 10/137 (AR 7%)	Lab test not done	Daycare	Person to Person
175	10/11/16 10:04 AM	10/11/16 10:12 AM	8	Northwestern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 55/239 (AR 23%)	Lab test not done	School	Person to Person
176	10/11/16 8:30 AM	10/11/16 12:00 PM	210	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 8/488 (AR 2%)	Lab test not done	School	Person to Person
177	10/13/16 12:00 PM	10/13/16 1:10 PM	70	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Students 8/415 (AR 2%)	Lab test not done	School	Person to Person
178	10/14/16 3:00 PM	10/14/16 3:45 PM	45	Eastern Region	WV	Hand, Foot, and Mouth Disease	Enterovirus	Students 36/9074 (AR 0.4)	Lab Confirmed	School	Person to Person
179	10/17/16 8:30 AM	10/17/16 9:18 AM	48	Northeastern Region	WV	Scabies	Sarcoptes scabiei	Residents 17/104 (AR 16%) Staff 3/50 (AR 6%)	Lab Confirmed	Nursing Home	Person to Person

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180	10/21/16 2:15 PM	10/21/16 2:31 PM	16	Southern Region	WV	Acute Gastroenteritis	Undetermined	Students 15/130 (AR 12%) Staff 2/13 (AR 15%)	Lab test not done	School	Person to Person
181	10/25/16 2:00 PM	10/25/16 2:25 PM	25	Northeastern Region	WV	Influenza	Influenza	Residents 4/43 (AR 9%)	Lab Confirmed	Assisted Living	Person to Person
182	10/26/16 1:30 PM	10/26/16 1:34 PM	4	Northeastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 4/35 (AR 11%)	Lab test not done	Daycare	Person to Person
183	10/27/16 11:30 AM	10/27/16 11:58 AM	28	Central Region	WV	Acute Respiratory Syndrome	Picornavirus	Residents 25/133 (AR 19%) Staff 21/197 (AR 11%)	Lab Confirmed	Nursing Home	Person to Person
184	10/27/16 3:45 PM	10/27/16 4:30 PM	45	Southern Region	WV	Acute Gastroenteritis	Undetermined	Residents 24/73 (AR 33%) Staff 13/180 (AR 7%)	Lab test not done	Nursing Home	Person to Person
185	11/4/16 8:15 AM	11/4/16 8:30 AM	15	Central Region	WV	Undifferentiated Rash Illness	Undetermined	Attendees 7/58 (AR 12%)	Lab test not done	Daycare	Person to Person
188	11/15/16 9:30 AM	11/15/16 10:03 AM	33	Central Region	WV	Norovirus Gastroenteritis	Norovirus GII	Residents 47/95 (AR 49%) Staff 18/70 (AR 26%)	Lab Confirmed	Assisted Living	Person to Person
189	11/17/16 10:30 AM	11/17/16 11:03 AM	33	Eastern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 14/55 (AR 25%)	Lab test not done	Nursing Home	Person to Person
190	11/18/16 1:00 PM	11/18/16 1:15 PM	15	Central Region	WV	Acute Gastroenteritis	Undetermined	Residents: 13/83 (AR 16%)	Lab test negative or noncontributory	Nursing Home	Person to Person
191	11/22/16 9:00 AM	11/22/16 9:11 AM	11	Northeastern Region	WV	Influenza	Influenza	Residents 30/67 (AR 45%) Staff 20/88 (AR 23%)	Rapid test positive but not culture confirmed	Nursing Home	Person to Person
192	11/23/16 12:15 PM	11/23/16 12:31 PM	16	Northeastern Region	WV	Scabies	Sarcoptes scabiei	Residents 13/104 (AR 13%) Staff 2/50 (AR 4%)	Lab Confirmed	Nursing Home	Person to Person
193	11/28/16 11:00 AM	11/28/16 11:30 AM	30	Northeastern Region	WV	Acute Respiratory Syndrome	Undetermined	Residents 15/115 (AR 13%)	Lab test negative or noncontributory	Nursing Home	Person to Person
194	11/28/16 3:20 PM	11/28/16 3:42 PM	22	Eastern Region	WV	Acute Gastroenteritis	Undetermined	Students 10/296 (AR 3%)	Lab test not done	School	Person to Person
195	11/30/16 1:45 PM	11/30/16 2:00 PM	15	Eastern Region	WV	Hand, Foot, and Mouth Disease	Undetermined	Attendees: 6/18 (AR 33%)	Lab test not done	Daycare	Person to Person

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196	12/1/16 11:00 AM	12/1/16 11:45 AM	45	Northwestern Region	WV	Scabies	Undetermined	Residents 4/23 (AR 17%) Staff 21/33 (AR 64%)	Lab test not done	Nursing Home	Person to Person
197	12/2/16 12:09 PM	12/2/16 12:55 PM	46	Central Region	WV	Conjunctivitis	Undetermined	Residents 4/58 (AR 7%)	Lab test not done	Nursing Home	Person to Person
198	12/2/16 4:35 PM	12/2/16 5:10 PM	35	Central Region	WV	Acute Gastroenteritis	Undetermined	Attendees 34/86 (AR 40%) Staff 15/28 (AR 54%)	Lab test not done	Daycare	Person to Person
199	11/21/16 5:00 PM	11/21/16 2:30 PM	150	Eastern Region	CDC/ Multi-state	Salmonellosis	Salmonella Javiana	Cases WV 1, National 45	Lab Confirmed	Community	Foodborne
200	12/5/16 1:50 PM	12/5/16 2:02 PM	12	Southern Region	WV	Norovirus Gastroenteritis	Norovirus GII	Residents: 26/52 (AR 50%) Staff 18/70 (AR 26%)	Lab Confirmed	Nursing Home	Person to Person
201	12/7/16 12:15 PM	12/7/16 12:30 PM	15	Western Region	WV	Influenza	Influenza A H3	Patients 6/10 (AR 60%) Staff 1	Lab Confirmed	Group Home	Person to Person
202	12/8/16 11:30 AM	12/8/16 11:45 AM	15	Central Region	WV	Acute Respiratory Syndrome	Respiratory Syncytial Virus (RSV)	Attendees 5	Lab Confirmed	Daycare	Person to Person
203	12/8/16 1:00 PM	12/8/16 1:14 PM	14	Southern Region	WV	Acute Gastroenteritis	Undetermined	Residents 38/63 (AR 60%) Staff 23/140 (AR 16%)	Lab test not done	Nursing Home	Person to Person
204	12/8/16 1:30 PM	12/8/16 1:46 PM	16	Western Region	WV	Acute Respiratory Syndrome	Influenza A H3, Parainfluenza, and Enterovirus/Rhinovirus	Patients 9/12 (AR 75%)	Lab Confirmed	Hospital	Person to Person
205	12/9/16 11:45 AM	12/9/16 11:47 AM	2	Eastern Region	WV	Acute Gastroenteritis	Undetermined	Students 12/188 (AR 5%) Staff 2/21 (AR 10%)	Lab test not done	School	Point Source
206	12/12/16 2:40 PM	12/12/16 2:53 PM	13	Central Region	WV	Acute Respiratory Syndrome	Respiratory Syncytial Virus (RSV)	Residents 34/97 (AR 35%) Staff 8/108 (AR 7%)	Lab Confirmed	Nursing Home	Person to Person
207	12/13/16 2:05 PM	12/13/16 2:30 PM	25	Western Region	WV	Influenza	Influenza A and B	Highest absentee rate 29%	Rapid test positive but not culture confirmed	School	Person to Person
208	12/15/16 12:00 PM	12/16/16 9:30 AM	1290	Central Region	WV	Acute Respiratory Syndrome	Undetermined	Attendees 9/20 (AR 45%)	Lab test not done	Daycare	Person to Person

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209	12/16/16 3:00 PM	12/16/16 3:15 PM	15	Northeastern Region	WV	Acute Gastroenteritis	Undetermined	Residents: 8/118 (AR 8%)	Lab test not done	Nursing Home	Person to Person
210	12/18/16 10:00 AM	12/18/16 10:15 AM	15	Northeastern Region	WV	Acute Respiratory Syndrome	Influenza A and RSV	Residents 25/115 (AR 22%) Staff 3/136 (AR 2%)	Lab Confirmed	Nursing Home	Person to Person
211	12/19/16 9:00 AM	12/19/16 9:29 AM	29	Northeastern Region	WV	Acute Gastroenteritis	Undetermined	Residents 32/131 (AR 24%) Staff 19/51 (AR 37%)	Lab test not done	Nursing Home	Person to Person
212	12/19/16 2:10 PM	12/19/16 3:27 PM	77	Northeastern Region	WV	Norovirus Gastroenteritis	Norovirus GII	Residents 8/40 (AR 20%) Staff 18/40 (AR 45%)	Lab Confirmed	Nursing Home	Person to Person
213	12/16/16 1:00 PM	12/16/16 1:00 PM	0	Eastern Region	WV	Hepatitis A	Hepatitis A Virus	Cases 2	Lab Confirmed	Community	Undetermined
214	12/22/16 10:20 AM	12/22/16 10:25 AM	5	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 21/93 (AR 23%) Staff 23/120 (AR 19%)	Lab test not done	Nursing Home	Person to Person
215	12/23/16 3:25 PM	12/23/16 3:40 PM	15	Western Region	WV	Influenza	Influenza A	Residents 8/48 (AR 17%) Staff 3	Lab Confirmed	Nursing Home	Person to Person
216	12/24/16 9:30 AM	12/24/16 10:15 AM	45	Eastern Region	WV	Acute Respiratory Syndrome	Influenza A and Coronavirus	Residents 4/103 (AR 4%) Staff 22/179 (AR 13%)	Lab Confirmed	Nursing Home	Person to Person
217	10/26/16 2:05 PM	10/26/16 2:35 PM	30	Central Region	WV	Influenza	Influenza A H3	Residents 19/67 (AR 28%) Staff 8/100 (AR 8%)	Lab Confirmed	Nursing Home	Person to Person
218	10/28/16 8:15 AM	10/28/16 8:45 AM	30	Northwestern Region	WV	Acute Respiratory Syndrome	Coronavirus and Enterorhinovirus	Residents 26/95 (AR 27%)	Lab Confirmed	Nursing Home	Person to Person
219	10/28/16 1:10 PM	10/28/16 1:20 PM	10	Northwestern Region	WV	Acute Gastroenteritis	Undetermined	Residents 15/60 (AR 25%) Staff 3/60 (AR 5%)	Lab test not done	Nursing Home	Person to Person