

West Virginia Outbreak Report 2023



Office of Epidemiology and Prevention Services

Division of Infectious Disease Epidemiology

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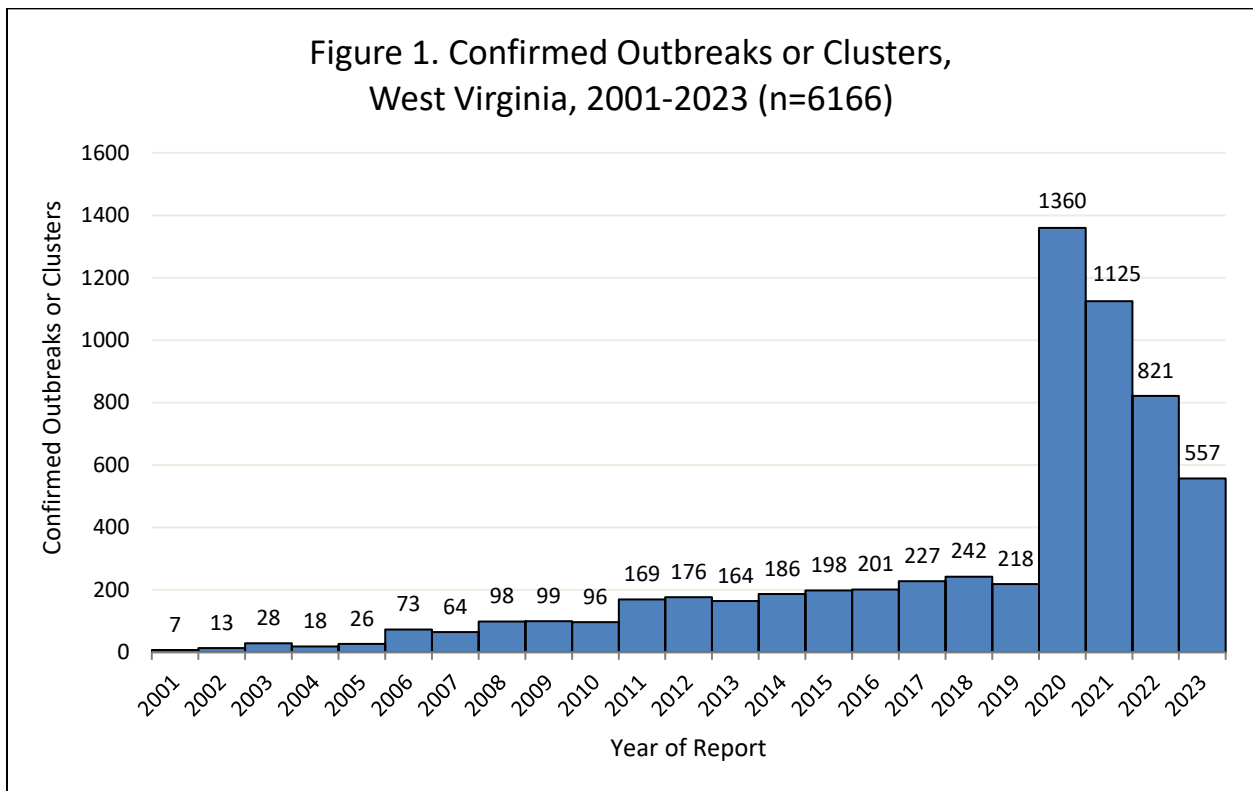
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Introduction

In West Virginia, outbreaks and clusters of any disease or illness in any setting are immediately reportable to the Local Health Department (LHD) pursuant to *Reportable Diseases, Events and Conditions (64CSR7)*. LHDs investigate and report outbreaks in collaboration with regional epidemiologists and the West Virginia Department of Health (DH), Bureau for Public Health (BPH), Division of Infectious Disease Epidemiology (DIDE). The results of these investigations were compiled by DIDE and are summarized by year in this report.

The number of confirmed outbreaks or clusters of disease reported in West Virginia increased more than 500% from 2019 to 2020 due to the COVID-19 pandemic. Although the number of outbreaks has consistently decreased since that peak in 2020, it remains significantly elevated compared to pre-pandemic levels.

In 2023, there were 584 infectious disease outbreaks identified and reported to local health departments (LHD). Of these reports, 557 (95%) were confirmed as outbreaks or clusters of disease and the remainder were investigated and determined not to be outbreaks.



Methods:

Outbreak data was collected in the Outbreak Reporting System (ORS). This system is a custom developed internal web application for outbreak investigation management, which utilizes a SQL Server database backend. Data collected includes information on outbreak type and setting, reporting county and region, time of reporting to LHD and BPH, clinical diagnosis, laboratory testing information, pathogens, mode of transmission, completion of final report, and lead investigator. Data was analyzed in Microsoft Excel and Epi Info™.

Results:

Jurisdiction:

In 2023, 548 (98%) confirmed outbreaks were limited to West Virginia residents, and nine (2%) outbreaks involved residents of other states. The Centers for Disease Control and Prevention (CDC) led the investigations of the nine multi-state outbreaks.

Type of Outbreaks

The most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness (Table 1).

Table 1. Confirmed Outbreaks by Type, West Virginia, 2023

Outbreak Type	Number of Outbreaks (n=557)	Percent
Respiratory	433	78%
Enteric	71	13%
Rash	48	8%
Other	3	<1%
Multidrug-Resistant Organisms (MDRO)	2	<1%

Outbreak Performance Measures

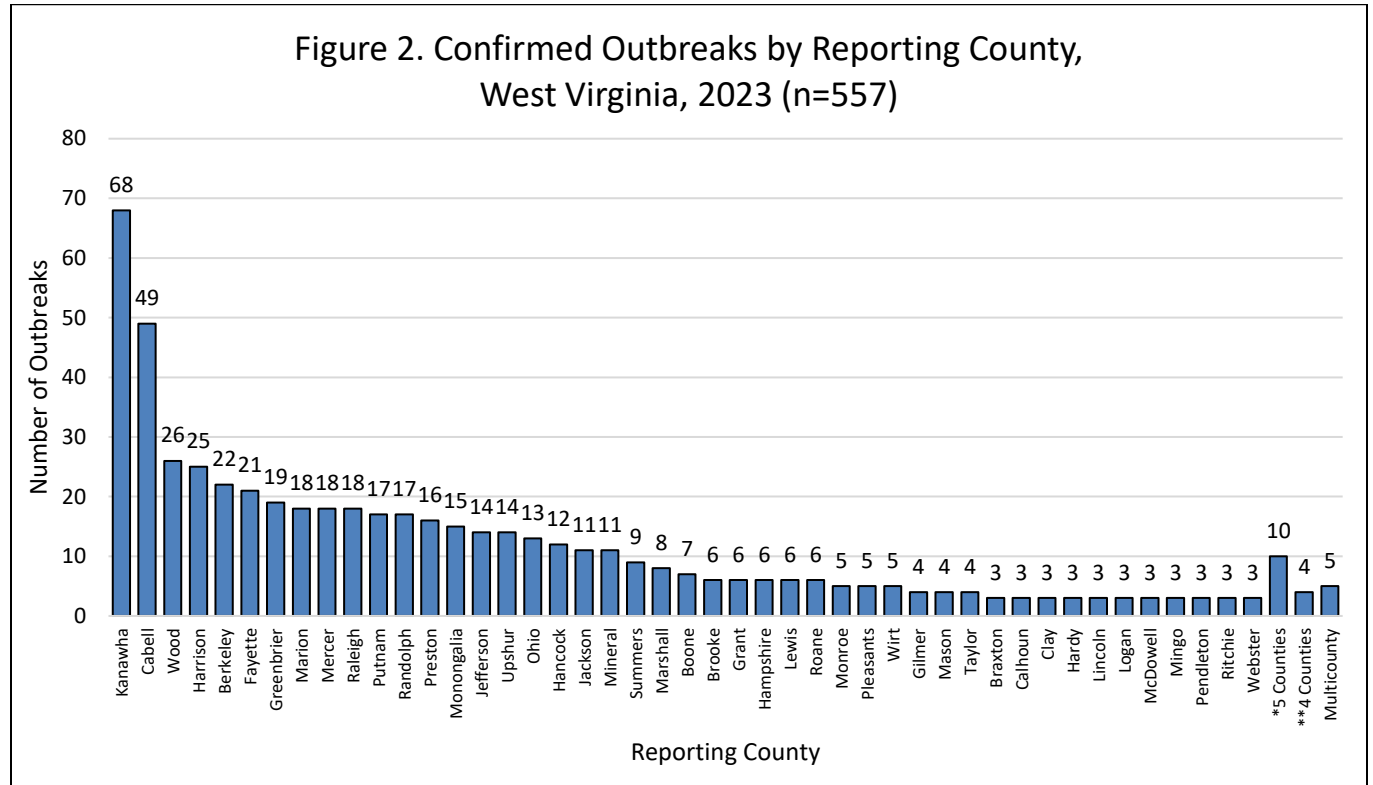
To improve outbreak response at the State, regional and local levels and to meet several grant requirements, DIDE has implemented outbreak performance measures. These measures include:

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

Outbreaks by Reporting Counties/Regions:

In 2023, 54 (98%) counties reported outbreaks (Table 2).

Kanawha County had the highest number of outbreaks reported with 68 (12%) each, followed by Cabell with 49 (9%) and (Figure 2). Five outbreaks were multi-jurisdictional outbreaks (Table 3). Individual outbreaks will be reported by surveillance region, rather than by reporting county, to maintain confidentiality of the reporting entity.



*Five counties each reported two outbreaks

** Four counties each reported one outbreak

Table 2. Confirmed Outbreaks by Reporting County, West Virginia, 2023 (n=557)

County	Number of Outbreaks
Barbour	2
Berkeley	22
Boone	7
Braxton	3
Brooke	6
Cabell	49
Calhoun	3
Clay	3
Doddridge	0
Fayette	21
Gilmer	4
Grant	6

Greenbrier	19
Hampshire	6
Hancock	12
Hardy	3
Harrison	25
Jackson	11
Jefferson	14
Kanawha	68
Lewis	6
Lincoln	3
Logan	3
Marion	18
Marshall	8
Mason	4
McDowell	3
Mercer	18
Mineral	11
Mingo	3
Monongalia	15
Monroe	5
Morgan	2
Nicholas	2
Ohio	13
Pendleton	3
Pleasants	5
Pocahontas	1
Preston	16
Putnam	17
Raleigh	18
Randolph	17
Ritchie	3
Roane	6
Summers	9
Taylor	4
Tucker	1
Tyler	1
Upshur	14
Wayne	2
Webster	3
Wetzel	2
Wirt	5
Wood	26
Wyoming	1
Multicounty*	5
Total	557

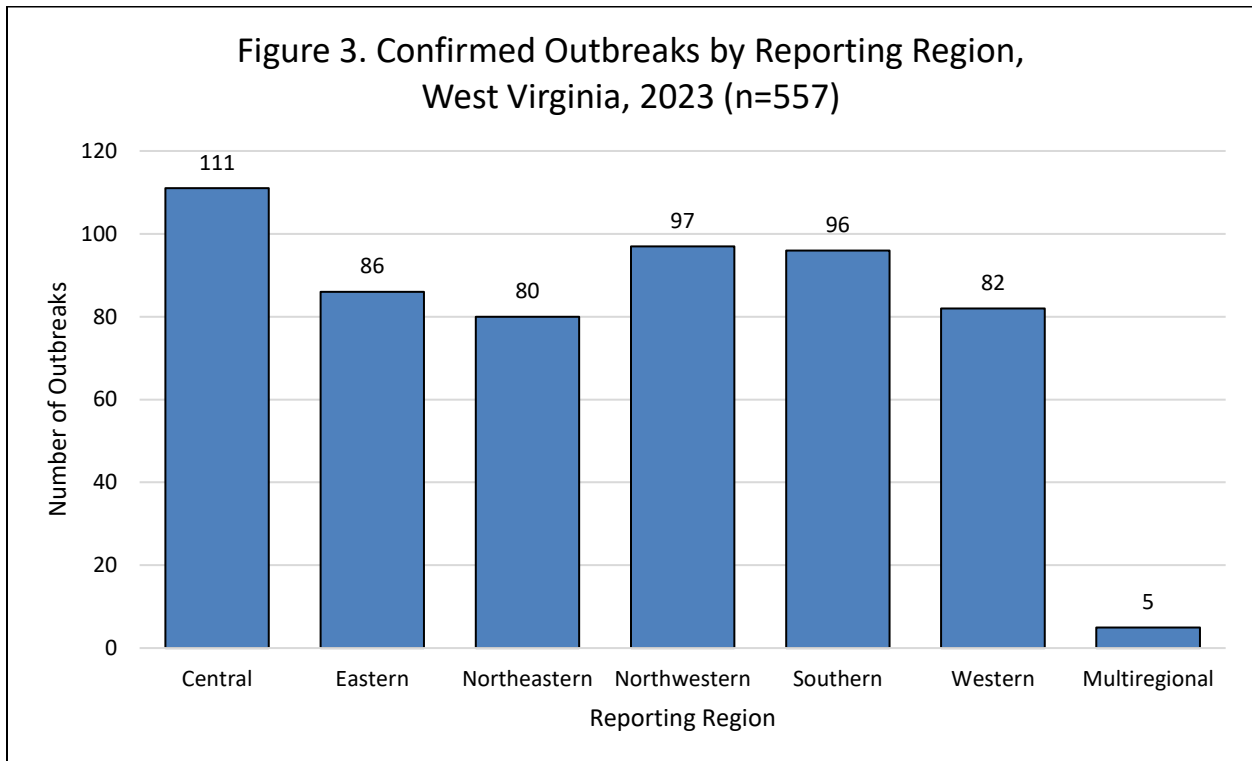
*See Table 3 for details

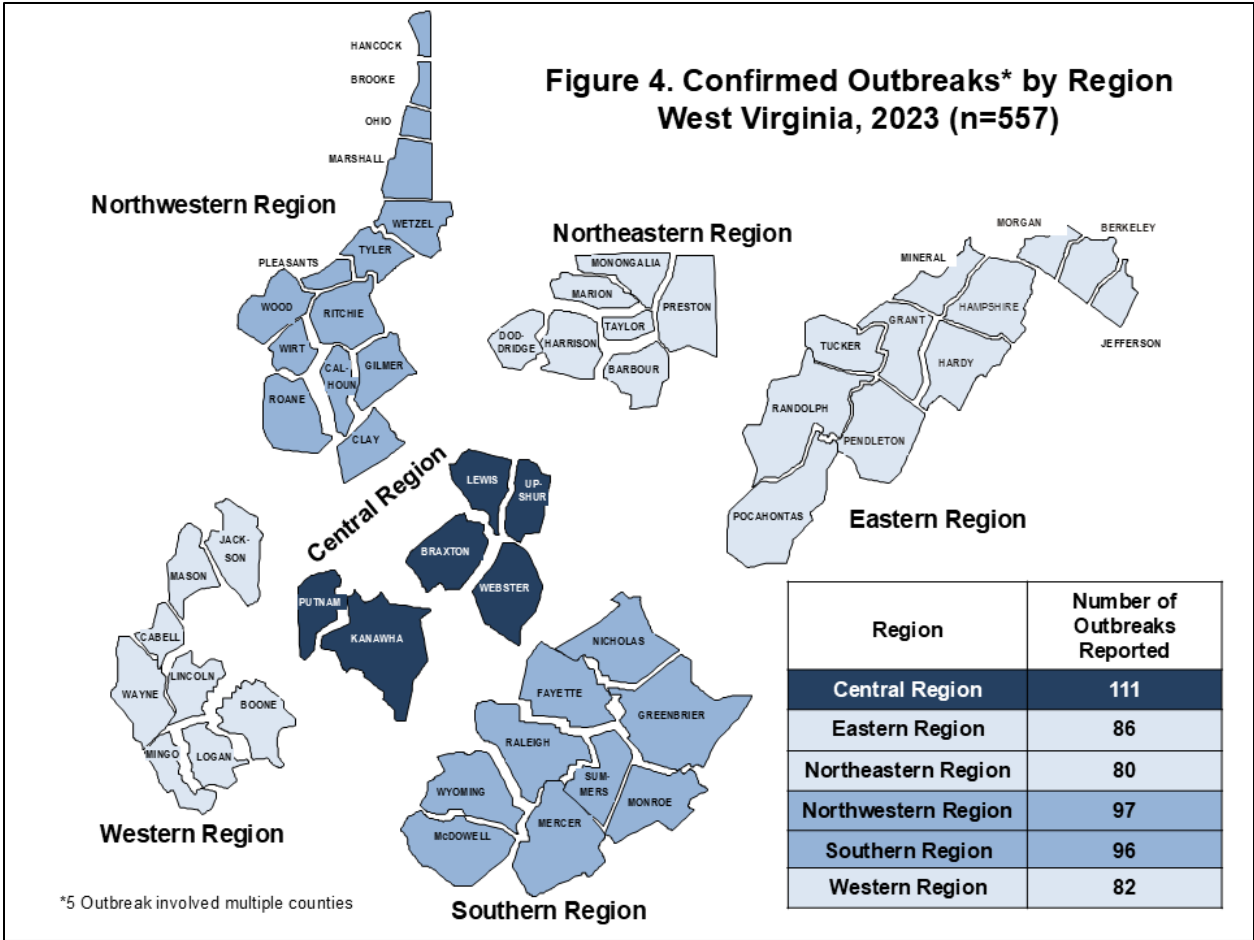
Table 3. Multi-County Outbreaks, West Virginia, 2023 (n=5)

Investigation Lead	Region	Counties with Cases
CDC	Northeastern and Southern	Nicholas, Marion (3 cases)
CDC	Northwestern, Southern, and Western	Cabell, Mercer, and Wood (3 cases)
CDC	Northwestern, Northeastern, Southern	Clay, Greenbrier, and Monongalia (3 cases)
CDC	All Regions	Berkeley, Hampshire, Harrison, Jackson, Kanawha, Monroe, Ohio, Preston, Randolph, Ritchie, Tucker, Upshur, Wayne, (17 cases)
CDC	All regions	Clay, Harrison, Jackson, Jefferson, Monongalia, Morgan, Putnam, Raleigh, Randolph, Roane, and Upshur (13 Cases)

Surveillance Regions:

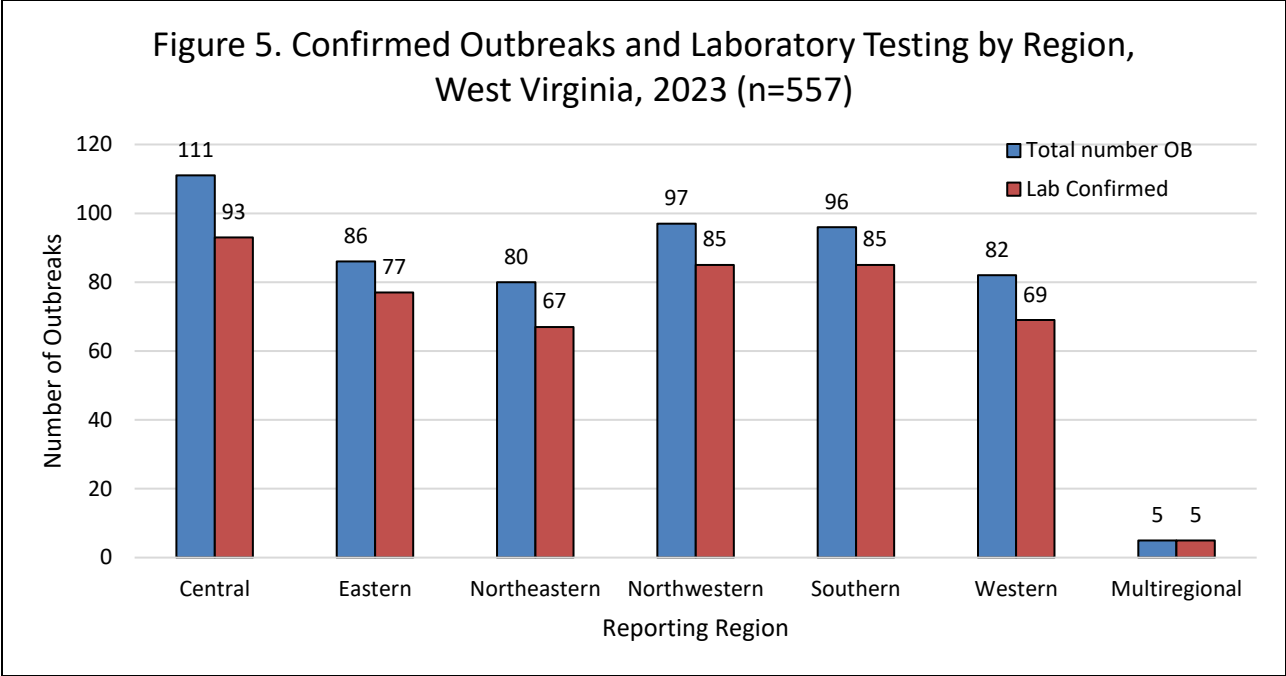
All surveillance regions in the state reported outbreaks in 2023 (Figure 3). A map of outbreaks by surveillance region is shown in Figure 4.





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 LHD. As shown in Figure 5, the percentage of outbreaks with laboratory testing varied by region from 84% to 90%. Of the 557 confirmed outbreaks, 481 (86%) had laboratory testing.



Some outbreaks do not require laboratory testing. Scabies as well as hand, foot, and mouth disease outbreaks are often confirmed by clinical diagnosis and/or symptom presentation and lab testing is not required. However, all respiratory and enteric outbreaks are recommended to have laboratory testing.

Figure 6 depicts laboratory confirmation of respiratory disease outbreaks by surveillance region. Of the 433 confirmed respiratory outbreaks, all (100%) had laboratory testing performed.

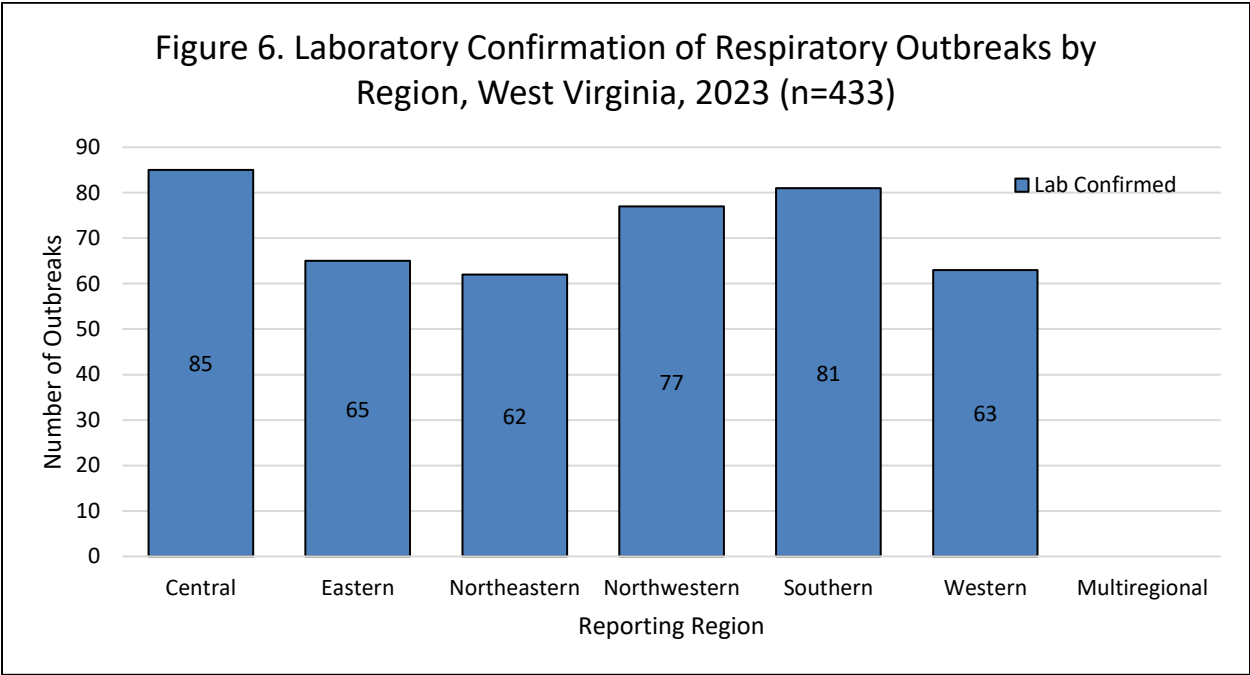
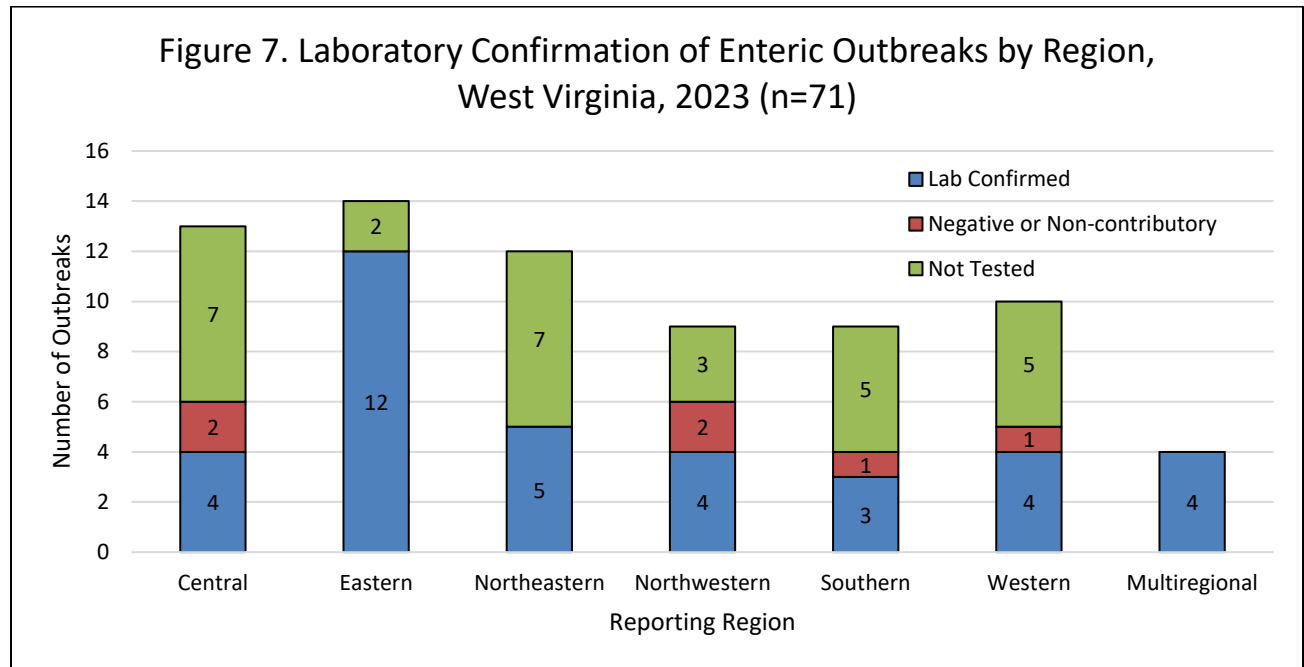


Figure 7 illustrates laboratory confirmation of enteric outbreaks by regions. Of the 75 confirmed enteric disease outbreaks, 36 (48%) had laboratory testing.



Outbreak Setting:

The majority of all outbreaks were reported from nursing homes, followed by assisted living facilities and daycares (Table 4).

Table 4. Confirmed Outbreaks by Transmission Setting, West Virginia, 2023

Facility Type	Number of Outbreaks (n=557)	Percent
Nursing Home	359	64%
Assisted Living	47	8%
Daycare	43	8%
School	31	6%
Community-Based	22	4%
Hospital	13	2%
Psychiatric Hospital	13	2%
Child Residential	8	1%
Other Residential	8	1%
Other	5	<1%
Correctional Facility	4	<1%
Other Healthcare	4	<1%

Outbreak Leadership:

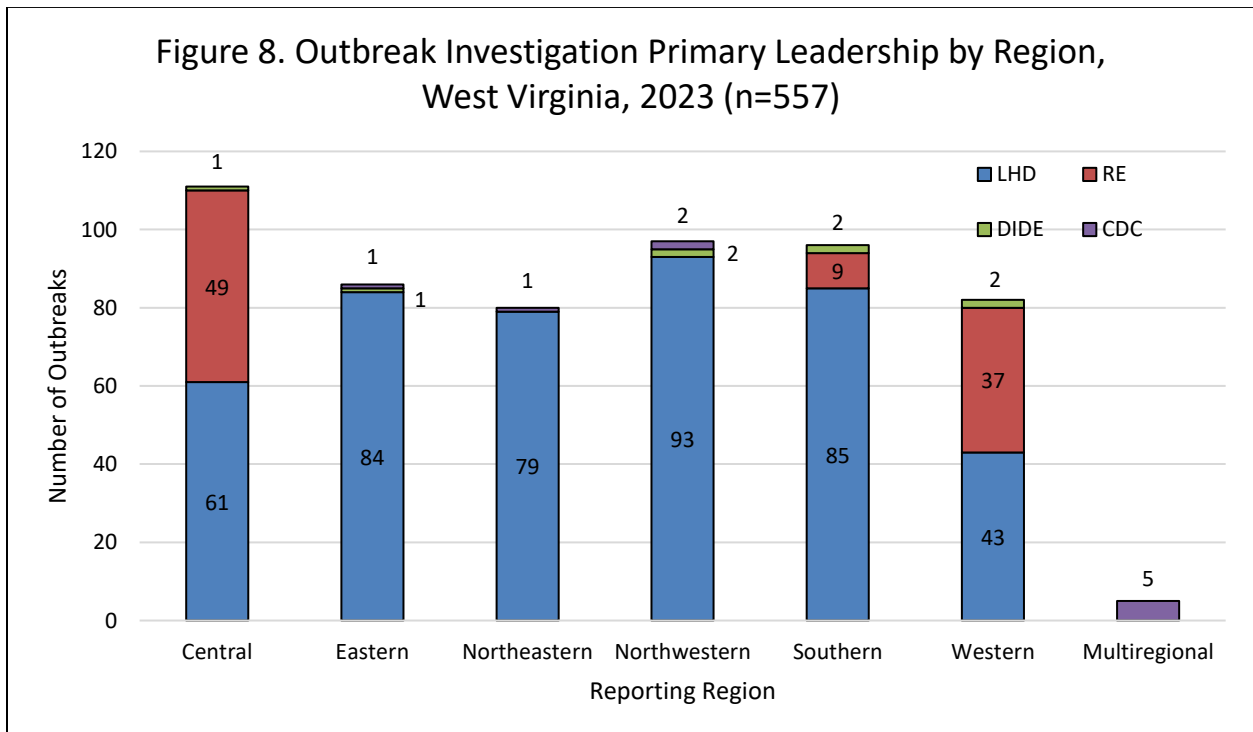
As part of Epidemiology and Laboratory Capacity (ELC) funding, the State and LHD are required to verify outbreak investigation leadership.

In 2023, LHD led the investigation in 445 (80%) outbreaks, followed by regional epidemiologists 95 (17%) and BPH/DIDE 8 (1.4%). CDC led the investigations in nine (1.6%) multi-state outbreaks (Table 5).

Table 5. Confirmed Outbreaks by Primary Leadership, West Virginia, 2023

Primary Leadership	Number of Outbreaks (n=557)	Percent
Local Health Departments (LHD)	445	80%
Regional Epidemiologists (RE)	95	17%
BPH/DIDE	8	1.4%
CDC	9	1.6%

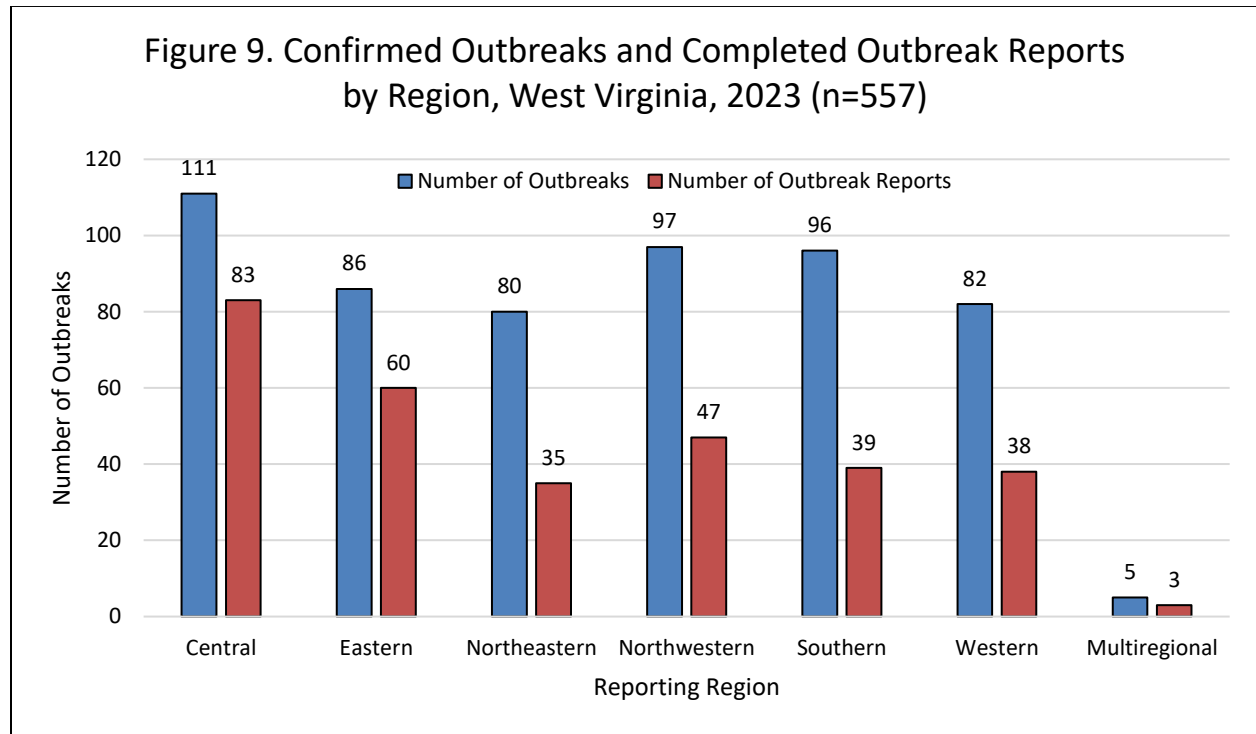
Outbreak investigation primary leadership varies by surveillance region. In most of the regions, primary leadership is collaboratively assigned between regional epidemiologists and the LHD. Figure 8 illustrates outbreak investigation leadership by region.



Outbreak Investigation Reports:

All outbreak investigations should have a final report pursuant to *Reportable Diseases, Events and Conditions* (64CSR7). The number of final outbreak reports generated by LHD and shared with stakeholders is tracked annually. 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 90 days of outbreak closure.

In 2023, a final outbreak report was completed in 305 (55%) outbreaks. The percentage of final outbreak reports completed by region varied from 41% to 75%.



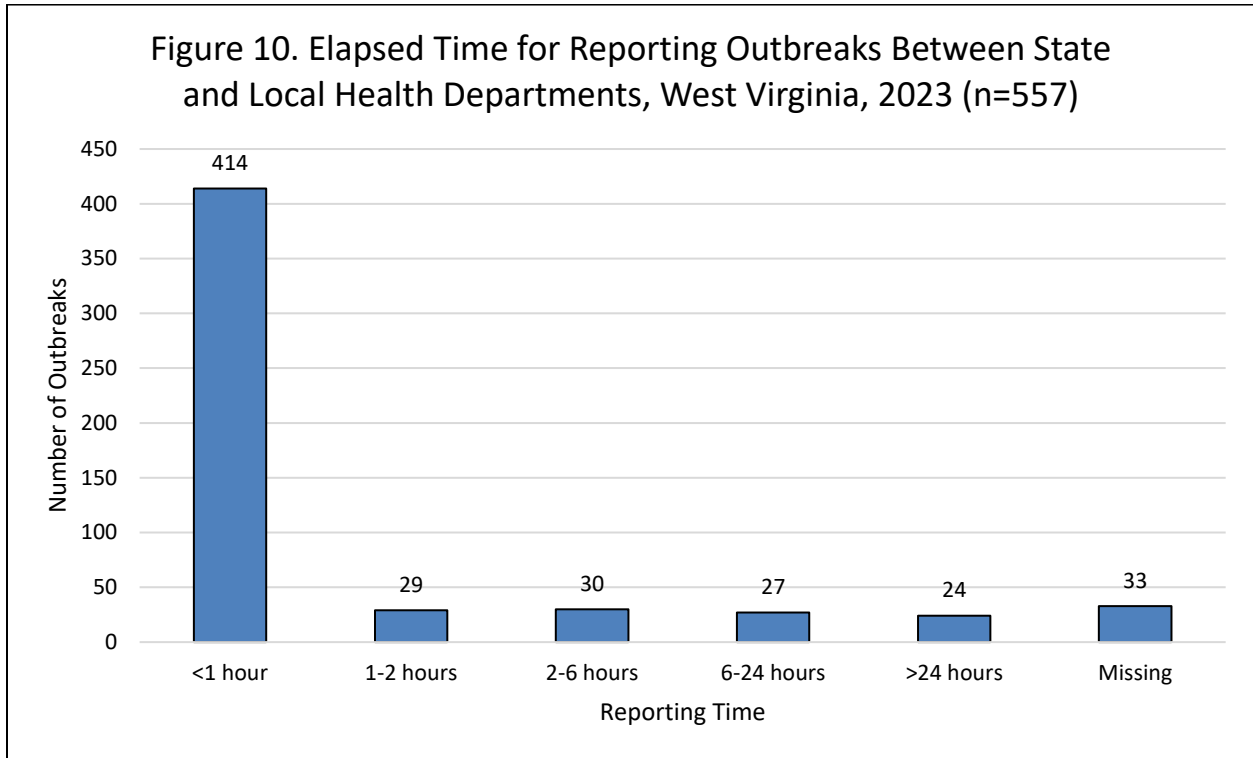
Outbreak Reporting Time:

According to *Reportable Diseases, Events and Conditions* (64CSR7), outbreaks or clusters of any illness or condition in any setting are immediately reportable to the LHD. As a condition of grant funding, LHD are required to report suspected outbreaks or clusters to 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 standardized form in ORS so that elapsed reporting time can be calculated.

In 2023, the date and time of report to the LHD and BPH were collected in 527 (94%) outbreaks. The mean and median of time elapsed between reporting to the LHD and reporting to the BPH was 291 and 25 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 zero to 17,225 minutes. Of the 527 confirmed outbreaks for which reporting time was collected, same-day notification occurred for 503 (95%) outbreaks and 414 (74%) were within 60 minutes (Figure 10).



Summary of Outbreak Performance Measures by Region/County
West Virginia, 2023

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

Table 6. Outbreak Performance Measures by Region, West Virginia, 2023

Region	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Central Region	111	83 (75%)	93 (84%)	20 (0-4601)
Eastern Region	86	60 (70%)	77 (90%)	25 (0-2515)
Northeastern Region	80	35 (44%)	67 (84%)	30 (0-17225)
Northwestern Region	97	47 (49%)	85 (88%)	15 (0-9081)
Southern Region	96	39 (41%)	85 (89%)	46 (0-5159)
Western Region	82	38 (46%)	69 (69%)	23 (0-7020)
Multiple Regions	5	3 (60%)	5 (100%)	39 (30-55)
All Regions	557	305 (55%)	481 (86%)	25 (0-17225)

Table 7. Outbreak Performance Measures by County, Central Region, West Virginia, 2023

Central Region	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Braxton	3	1 (33%)	3 (100%)	15 (10-70)
Kanawha	68	44 (65%)	54 (79%)	20 (0-4601)
Lewis	6	6 (100%)	5 (83%)	148 (10-2670)
Putnam	17	16 (94%)	15 (88%)	31 (0-1362)
Upshur	14	13 (93%)	13 (93%)	15 (5-1075)
Webster	3	3 (100%)	3 (100%)	202 (32-372)
Central Region	111	83 (75%)	93 (84%)	20 (0-4601)

Table 8. Outbreak Performance Measures by County, Eastern Region, West Virginia, 2023

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Berkeley	22	18 (82%)	15 (68%)	23 (0-256)
Grant	6	0 (0%)	6 (100%)	47 (0-2360)
Hampshire	6	3 (50%)	6 (100%)	16 (10-24)
Hardy	3	2 (67%)	3 (100%)	15 (0-15)
Jefferson	14	10 (71%)	13 (93%)	39 (6-1420)
Mineral	11	8 (73%)	11 (100%)	75 (16-2515)
Morgan	2	2 (100%)	2 (100%)	2 (2)
Pendleton	3	1 (33%)	3 (100%)	35 (10-35)
Pocahontas	1	0 (0%)	1 (100%)	25 (25)
Randolph	17	16 (94%)	16 (94%)	17 (5-239)
Tucker	1	0 (0%)	1 (100%)	25 (25)
Eastern Region	86	60 (70%)	77 (90%)	25 (0-2515)

Table 9. Outbreak Performance Measures by County, Northeastern Region, West Virginia, 2023

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Barbour	2	1 (50%)	2 (100%)	74 (27-120)
Doddridge	0			
Harrison	25	3 (12%)	23 (92%)	23 (0-17225)
Marion	18	14 (78%)	13 (72%)	62 (0-1352)
Monongalia	15	1 (7%)	6 (60%)	25 (0-10520)
Preston	16	16 (100%)	10 (63%)	21 (0-155)
Taylor	4	0 (0%)	3 (75%)	10 (0-20)
Northeastern Region	80	35 (44%)	67 (84%)	30 (0-17225)

Table 10. Outbreak Performance Measures by County, Northwestern Region, West Virginia, 2023

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Brooke	6	3 (50%)	6 (100%)	26 (0-2822)
Calhoun	3	0 (0%)	1 (33%)	0 (0)
Clay	3	1 (33%)	1 (33%)	45 (12-99)
Gilmer	4	3 (75%)	4 (100%)	1343 (110-1521)
Hancock	12	12 (100%)	10 (83%)	15 (0-1341)
Marshall	8	2 (25%)	8 (100%)	20 (1-72)
Ohio	13	3 (23%)	13 (100%)	41 (0-1560)
Pleasants	5	3 (60%)	5 (100)	0-5 (0)
Richie	3	2 (67%)	3 (100%)	5 (0-16)
Roane	6	1 (17%)	6 (100%)	3 (0-3910)
Tyler	1	1 (100%)	1 (100%)	347 (347)
Wetzel	2	2 (100%)	2 (100%)	455 (20-9081)
Wirt	5	2 (40%)	4 (80%)	0 (0-700)
Wood	26	12 (46%)	21 (81%)	12 (0-3514)
Northwestern Region	97	47 (49%)	85 (88%)	15 (0-9081)

Table 11. Outbreak Performance Measures by County, Southern Region, West Virginia, 2023

County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Fayette	21	10 (48%)	21 (100%)	58 (12-1387)
Greenbrier	19	7 (37%)	18 (95%)	72 (0-4035)
McDowell	3	1 (33%)	3 (100%)	22 (19-50)
Mercer	18	6 (33%)	15 (83%)	25 (4-1390)
Monroe	5	3 (60%)	4 (80%)	27 (9-1270)
Nicholas	2	1 (50%)	2 (100%)	104 (53-154)
Raleigh	18	7 (39%)	15 (83%)	30 (5-2070)
Summers	9	4 (44%)	6 (67%)	32 (0-5159)
Wyoming	1	0 (0%)	1 (100%)	50 (50)
Southern Region	96	39 (41%)	85 (89%)	46 (0-5159)

Table 12. Outbreak Performance Measures by County, Western Region, West Virginia, 2017

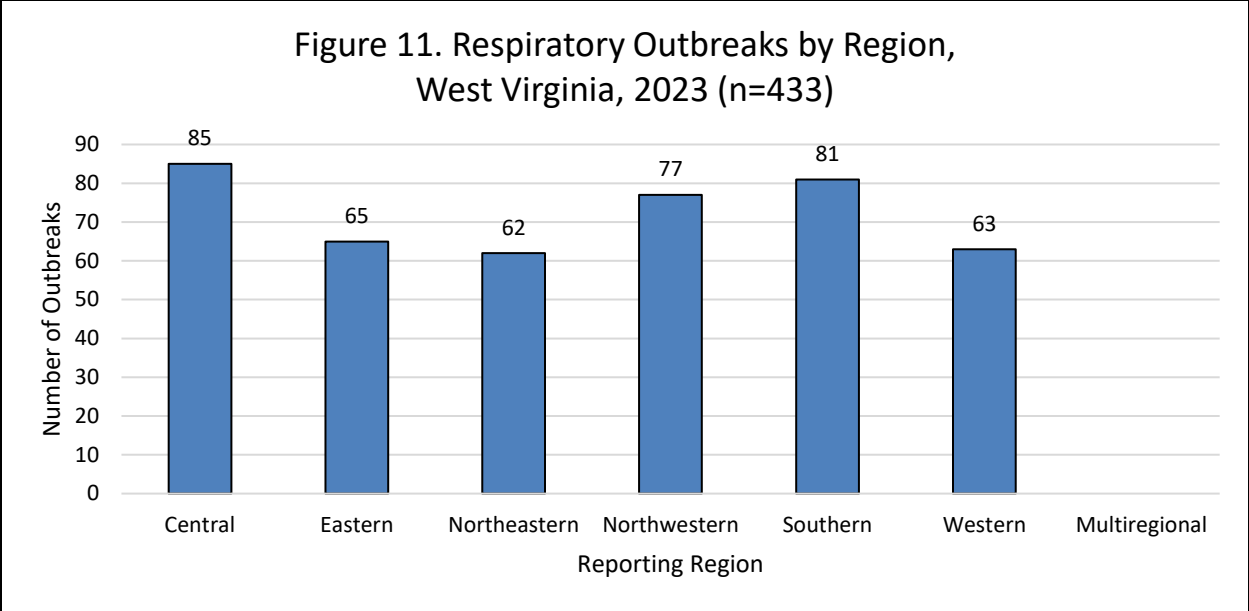
County	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Boone	7	4 (57%)	7 (100%)	22 (15-75)
Cabell	49	17 (35%)	39 (80%)	22 (0-4500)
Jackson	11	8 (73%)	9 (82%)	17 (2-1145)
Lincoln	3	3 (100%)	3 (100%)	15 (15-29)
Logan	3	2 (67%)	2 (67%)	30 (21-30)
Mason	4	3 (75%)	4 (100%)	104 (45-7020)
Mingo	3	1 (33%)	3 (100%)	60 (13-94)
Wayne	2	0 (0%)	2 (100%)	23 (23)
Western Region	82	38 (46%)	69 (69%)	23 (0-7020)

Table 13. Outbreak Performance Measures, Multiple Counties/Regions, West Virginia, 2023

Multiple Regions	Number of Outbreaks	Outbreaks with Completed Reports: No. (%)	Outbreaks with Laboratory Testing: No. (%)	Median Report Time in Minutes (Range)
Multiple Regions	5	3 (60%)	5 (100%)	39 (30-55)

Respiratory Disease Outbreaks, West Virginia, 2023 (n=433)

Outbreaks of respiratory illness were the most common type of disease outbreak reported in 2023, accounting for 78% of confirmed outbreaks (Table 1). Respiratory illness outbreaks were reported by 53 (96%) counties from all six surveillance regions (Figure 11).

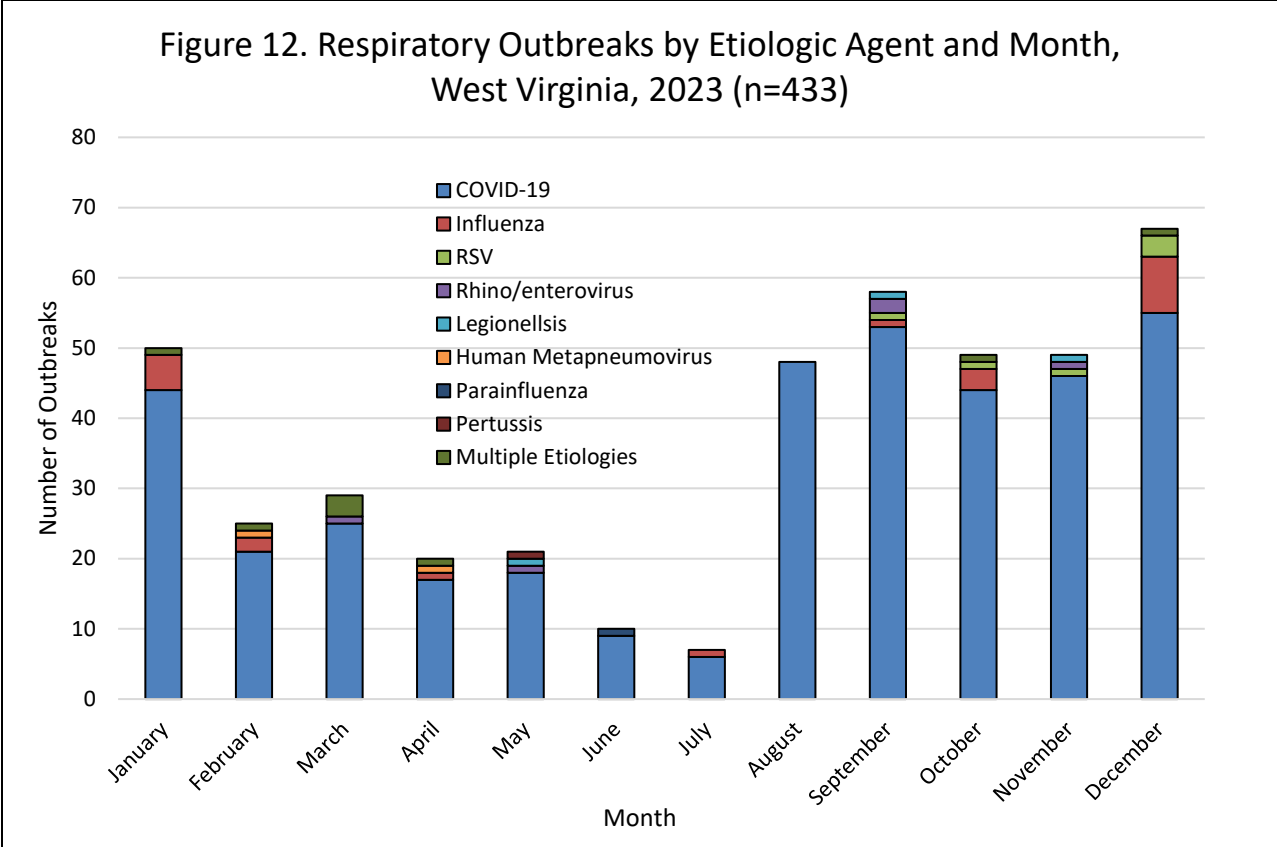


COVID-19 outbreaks were the most frequently reported respiratory disease outbreak followed by influenza. (Table 14).

Table 14. Respiratory Disease Outbreaks by Etiology/Clinical Diagnosis, West Virginia, 2023

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=433)	Percent	Mean Number of Cases (Range)
COVID-19	386	89%	28 (1-239)
Influenza	21	5%	8 (2-21)
Respiratory Syncytial Virus (RSV)	6	1.4%	11 (3-21)
Rhino/enterovirus	5	1.2%	11 (5-21)
Legionellosis	3	<1%	2 (1-3)
Human Metapneumovirus	2	<1%	26 (21-31)
Parainfluenza	1	<1%	9 (9)
Pertussis	1	<1%	9 (9)
Multiple Etiologies	8	1.8%	31 (4-57)

Figure 12 illustrates respiratory disease outbreaks by etiologic agent and month of onset. Respiratory outbreaks are listed by etiologic agents including other pathogens in table 14.



The majority of respiratory disease outbreaks were reported from nursing homes followed by assisted living facilities (Table 15).

Table 16. Respiratory Disease Outbreaks by Transmission Setting, West Virginia, 2023

Transmission Setting	Number of Outbreaks (n=433)	Percent
Nursing Home	316	73%
Assisted Living Facility	45	10%
School	13	3%
Psychiatric Hospital	11	2.5%
Hospital	10	2.3%
Child Residential	8	1.8%
Daycare	8	1.8%
Other Residential	8	1.8%
Other	5	1.2%
Correctional Facility	4	1%
Other Healthcare	4	1%
Community-Based	1	<1%

COVID Outbreaks:

There were 386 COVID-19 outbreaks in 2023, accounting for 89% of respiratory outbreaks and 69% of all outbreaks. The majority (283, 73%) were reported from nursing homes (Table 17). COVID-19 outbreaks are not uncommon among residents of nursing homes and other institutionalized populations. Nursing homes residents have a higher risk for complications from COVID-19 infections, including death.

Table 17. COVID-19 Outbreaks by Transmission Setting, West Virginia, 2023

Transmission Setting	Number of Outbreaks (n=386)	Percent
Nursing Home	283	73%
Assisted Living Facility	43	11%
Psychiatric Hospital	11	3%
School	9	2%
Hospital	8	2%
Child Residential	8	2%
Other Residential	8	2%
Daycare	5	1%
Other	4	1%
Correctional Facility	4	1%
Other Healthcare	3	<1%

The 283 COVID-19 outbreak in nursing homes involved 8,835 cases with a mean and median of 31 and 35 cases per outbreak respectively. Residents accounted for 4938 (56%) of the cases with facility staff making up the remaining 3897 (44%). There were 73 deaths reported to be associated with these COVID-19 outbreaks. The range of days open was 10-194 days with a mean and median of 43 and 35 days.

Influenza Outbreaks:

In 2023, there were 21 laboratory confirmed influenza outbreaks, accounting for 10% of all respiratory outbreaks. Ten (48%) influenza outbreaks were confirmed by Polymerase Chain Reaction (PCR) and 11 (52%) were confirmed by rapid influenza diagnostic test (RIDT). Table 18 depicts influenza outbreaks by type of influenza virus.

Table 18. Influenza Outbreaks by Type of Influenza Virus, West Virginia, 2023

Etiologic Agent	Number of Outbreaks (n=21)	Percent
Influenza A	14	67%
Influenza (no typing)	4	19%
Influenza A and B	2	10%
Influenza B	1	5%

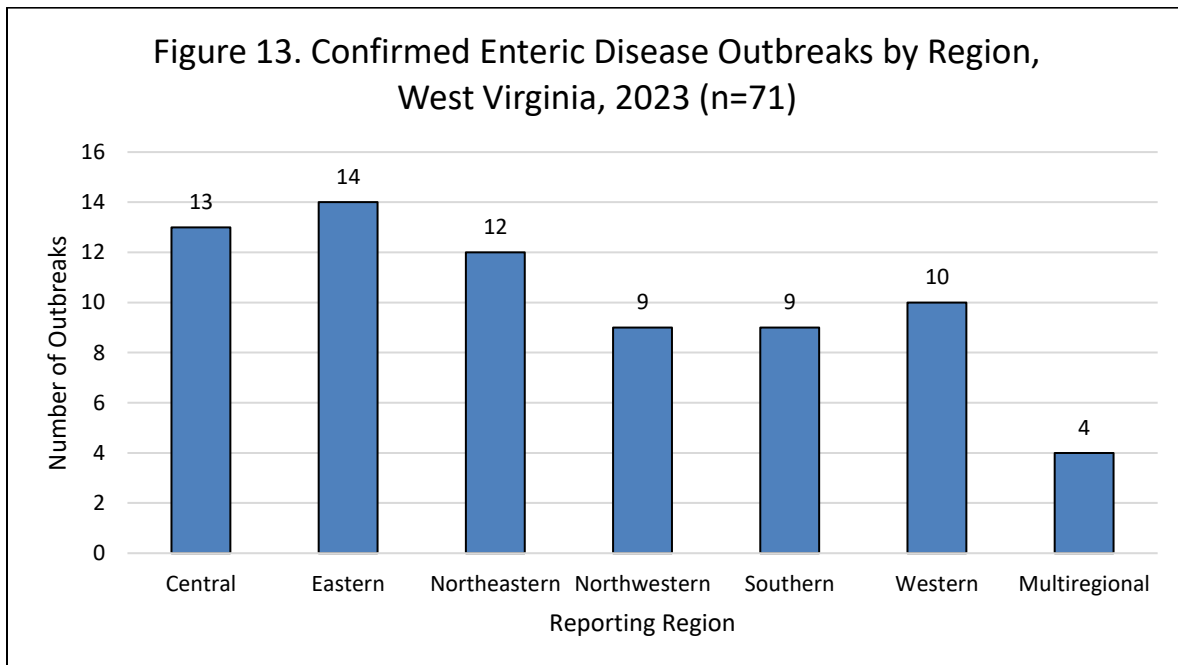
Nursing homes reported the majority (15, 71%) of influenza outbreaks (Table 19). Like COVID-19 outbreaks, influenza outbreaks are not uncommon among residents of nursing homes and residents have a higher risk for complications from influenza.

Table 19. Influenza Outbreaks by Transmission Setting, West Virginia, 2023

Transmission Setting	Number of Outbreaks (n=21)	Percent
Nursing Home	15	71%
School	2	10%
Assisted Living Facility	2	10%
Community	1	5%
Other Healthcare	1	5%

Enteric Disease Outbreaks, West Virginia, 2023 (n=71)

Outbreaks of enteric illness were the second most common type of disease outbreak in 2023, accounting for 13% of all outbreaks (Table 1). Seventy-one enteric disease outbreaks were reported by 29 (53%) counties. All six surveillance regions reported enteric disease outbreaks (Figure 13). One enteric illness outbreak reported in West Virginia was part of a multi-state outbreak led by CDC.



Forty-four (62%) enteric disease outbreaks were reported from healthcare facilities, including forty from nursing homes (Table 20).

Table 20. Enteric Disease Outbreaks by Transmission Setting, West Virginia, 2023

Transmission Setting	Number of Outbreaks (n=71)	Percent
Nursing Home	40	56%
Community	14	20%
Daycare	4	6%
School	4	6%
Restaurant	3	4%
Assisted Living Facility	2	3%
Hospital	2	3%
Psychiatric Hospital	2	3%

Outbreaks of acute gastroenteritis with undetermined etiology were the most common type of enteric disease outbreak, accounting for 34 (48%) outbreaks, followed by outbreaks of norovirus gastroenteritis (21, 30%) outbreaks (Table 21). 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 34 outbreaks characterized as acute gastroenteritis, laboratory tests were negative or noncontributory in five outbreaks and no testing was done in the remaining 29 outbreaks. The outbreaks followed a pattern of transmission consistent with norovirus gastroenteritis outbreaks, suggesting that many of these outbreaks were likely caused by norovirus.

All norovirus outbreaks were confirmed by PCR testing.

Table 21. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2023

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=71)	Percent	Mean Number of Cases (Range)
Acute Gastroenteritis	34	48%	19 (3-91)
Norovirus Gastroenteritis	21	30%	29 (3-78)
Salmonellosis	8	11%	3 (1-17)
Botulism	2	3%	1 (1)
Rotavirus Gastroenteritis	2	3%	10 (6-13)
Sapovirus Gastroenteritis	1	1%	4 (4)
Shigellosis	1	1%	1 (1)
<i>Escherichia coli</i> Gastroenteritis	1	1%	3 (3)
Campylobacteriosis	1	1%	13 (13)

Most enteric disease outbreaks (56, 79%) were due to person-to-person transmission followed by foodborne illness (eight, 11%), and animal contact (one, 1%). The source of illness was not determined in the remaining enteric disease outbreaks (six, 8%).

Rash Illness Outbreaks, West Virginia, 2023 (n=48)

Rash illness outbreaks were the third most common outbreak type in 2023, with 48 (8%) confirmed outbreaks (Table 1). Twenty (36%) counties from all six surveillance regions reported rash illness outbreaks (Figure 14).

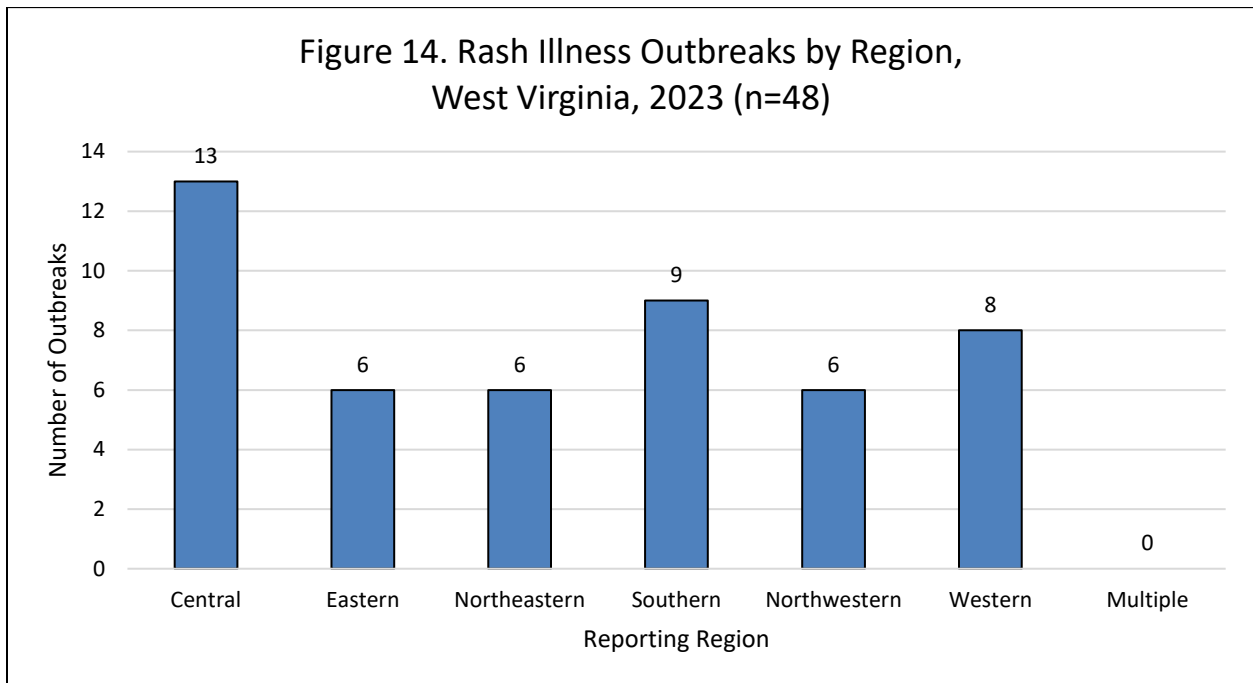


Table 22. Rash Illness Outbreaks by Transmission Setting, West Virginia, 2023

Transmission Setting	Number of Outbreaks (n=48)	Percent
Daycare	32	67%
School	13	27%
Nursing Home	2	4%
Community	1	2%

The most common type of rash illness outbreaks reported was hand, foot, and mouth disease (HFMD) as shown in Table 23.

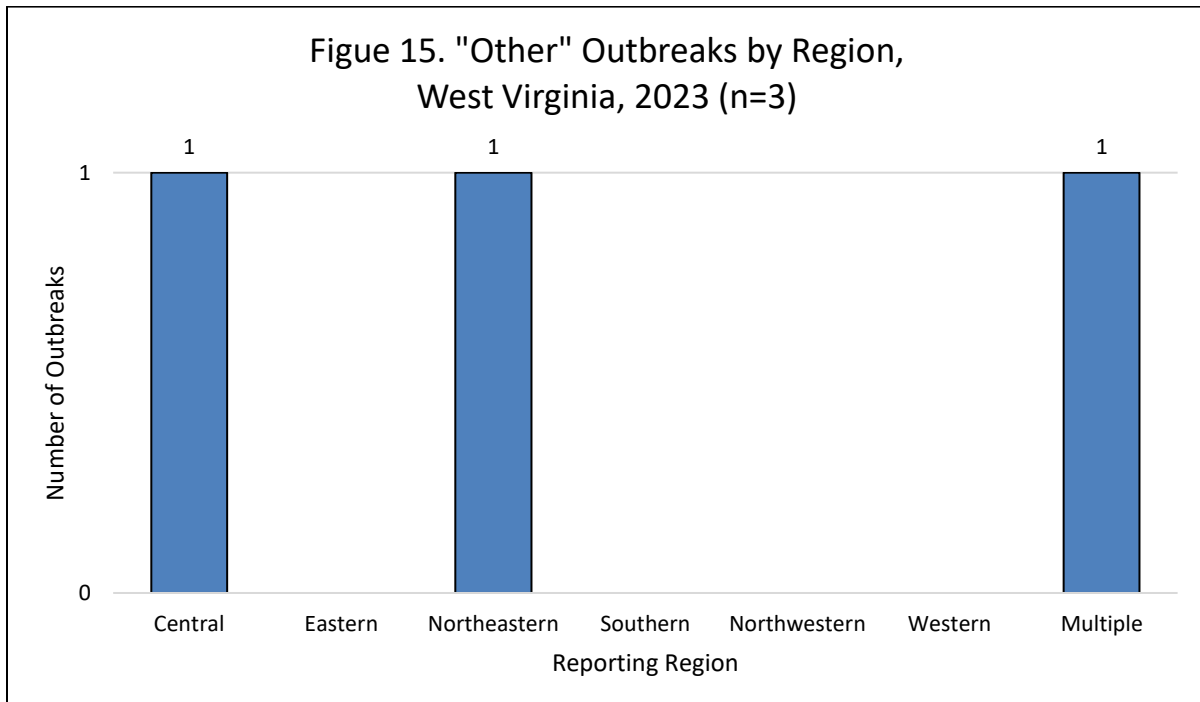
Table 23. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2023

Clinical Diagnosis	Number of Outbreaks (n=48)	Percent	Mean Number of Cases (Range)
HFMD	45	94%	8 (3-16)
Scabies	2	4%	4 (2-6)
Dermatitis	1	2%	8 (8)

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.

“Other” Outbreaks, West Virginia, 2023 (n=3)

In 2023, there were three (0.5%) outbreaks categorized as “Other.” (Figure 15).



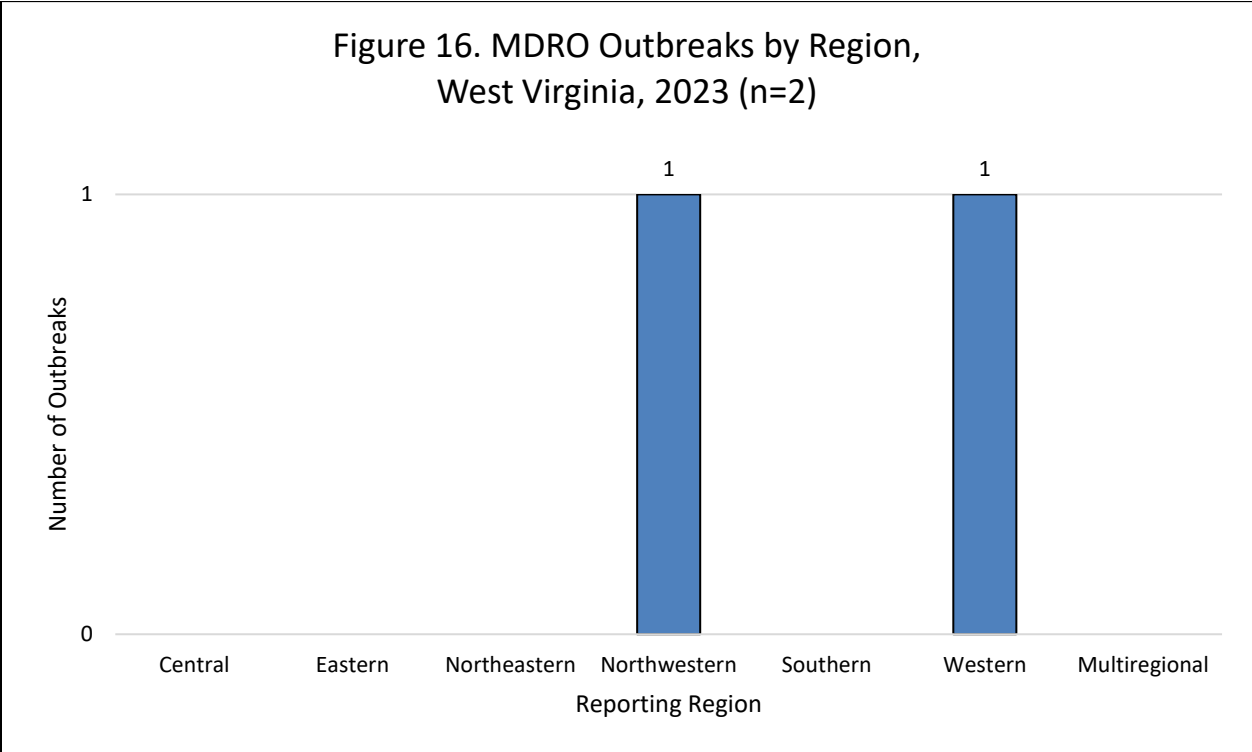
Outbreaks categorized as “Other” outbreaks included one outbreak of conjunctivitis, one outbreak of parotitis of undetermined etiology, and one outbreak of lead poisoning associated with consumption of applesauce which was a nationwide investigation.

Table 24. Outbreaks Categorized as “Other” Clinical Syndrome/Etiologic Agent, West Virginia, 2023

Clinical Diagnosis	Number of Outbreaks (n=3)	Percent	Mean Number of Cases (Range)
Conjunctivitis	1	33%	47 (47)
Parotitis (undetermined etiology)	1	33%	38 (38)
Lead Poisoning	1	33%	5 (5)

MDRO Outbreaks, West Virginia, 2023 (n=2)

There were two (0.4%) outbreaks categorized as MDRO (Figure 16).



There were two outbreaks classified as MDRO in 2023. The first was an outbreak of *Clostridioides difficile* (C. diff) in a nursing home. There were four cases associated with the outbreak and the mode of transmission was not determined.

The second MDRO outbreak was *Stenotrophomonas maltophilia* in a hospital. The investigation of this outbreak revealed the bacteria was not drug resistant; however, transmission did occur resulting in 10 cases within the hospital during the outbreak.

Table 25. MDRO Outbreaks by Clinical Syndrome/Etiologic Agent, West Virginia, 2023

Clinical Diagnosis	Number of Outbreaks (n=2)	Percent	Mean Number of Cases (Range)
Clostridioides difficile	1	50%	4 (4)
Stenotrophomonas Maltophilia	1	50%	10 (10)

Infection Control Assessment and Response (ICAR), West Virginia, 2023

The basic elements of an infection prevention program are designed to prevent the spread of infection in health care and other congregate settings, such as youth residential and correctional settings. When these elements are present and practiced consistently, the risk of infection among patients and health care personnel is reduced. The ICAR program is a consultative non-punitive assessment used to systematically assess infection prevention and control practices within a facility. Assessments may be performed:

- At the request of a facility
- When an outbreak has occurred
- When an infection control breach has been reported
- As a preventive measure, OR
- Based upon data analysis.

In 2023, there were 317 ICAR assessments completed. Of those, 229 (72%) were in response to an outbreak investigation and the remainder were completed as a preventative measure. ICAR consultations by facility type can be seen in Table 26 below.

Table 26. ICAR Consultations by Facility Type, West Virginia, 2023

Facility type	Preventive	Response	Total
Nursing Home	77	195	272
Assisted Living	0	21	21
Outpatient Clinic	10	0	10
Psychiatric Facility	1	8	9
Acute Care Hospital	0	2	2
Long Term Acute Care Hospital	0	2	2
Rehabilitation Facility	0	1	1
Total	88	229	317

Findings and Recommendations

In 2023, 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 and increased awareness of reporting requirements 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 LHD:

1. According to the West Virginia Reportable Disease Rule, outbreaks are immediately reportable in West Virginia to LHD regardless of outbreak setting.
2. In 2023, 54 (98%) of the 55 West Virginia counties reported outbreaks. DIDE encourages LHD to continue to strengthen relationships and maintain an open dialogue with healthcare facilities, schools, 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 2023 was 80 to 111 outbreaks, even though there are similar numbers of healthcare facilities and schools in each surveillance region. DIDE encourages LHD, with assistance from regional epidemiologists, to provide regular training on outbreak identification and reporting to stakeholders.
4. In 2023, 414 (74%) outbreaks were reported to DIDE within one hour, and 503 (95%) were reported within 24 hours. LHD 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. Reporting time could not be calculated for 33 (6%) of the outbreaks in 2023 due to missing data. The time the LHD is notified of an outbreak LHD should be provided to the RE or DIDE when the outbreak is reported.
6. LHD should consult with the regional epidemiologists and DIDE during outbreak investigations. Collaboration with RE and DIDE can ensure appropriate mitigation measures are in place and laboratory testing is completed to decrease morbidity and mortality during an outbreak.
7. 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: <https://oeps.wv.gov/toolkits/pages/default.aspx>
8. As per *Reportable Diseases, Events and Conditions* (64CSR7), the LHD are required to complete a final outbreak report for each outbreak. Consider using outbreak specific templates provided by DIDE. Templates can be accessed at: https://oeps.wv.gov/toolkits/Pages/toolkits_reports.aspx
9. Outbreak reports should be shared with DIDE and other stakeholders, including the reporting facility, within 30 days of closing the outbreak. The reports serve as a record of events, identifies

areas for improvement to prevent similar outbreaks in the future, and can be used to institute change within the reporting facility.

10. Respiratory disease outbreaks accounted for 78% of all outbreaks reported in 2023. LHD should be prepared for respiratory outbreaks in schools and nursing homes. 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.
 - COVID-19 and influenza vaccinations are the best preventive measure.
 - Keep a minimum of five unexpired respiratory testing kits in the local health department throughout the year.
 - Consider communicating with and educating school nurses and nursing home IPs about respiratory disease during the pre-influenza season.
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 LHD is to attempt to collect appropriate specimens during all respiratory and foodborne. In 2023, 100% of all respiratory outbreaks were laboratory confirmed and 48% of enteric outbreaks. LHD should consider assisting healthcare facilities with testing at the West Virginia Office of Laboratory Services (WVOLS) during routine enteric outbreaks to direct infection control measures and maintain ongoing surveillance.

Findings and Recommendations for Nursing Homes:

1. Outbreaks should be reported immediately to LHD, according to the West Virginia Reportable Disease Rule.
2. Nursing homes continue to account for many of the outbreaks (359, 64%) reported in the state. These outbreaks are occasionally severe and associated with high morbidity and mortality. Nursing homes should dedicate, train, and maintain a designated IP in the facility at all times.
3. Nursing homes 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:
<https://oepe.wv.gov/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 COVID-19, influenza, and other respiratory outbreaks:
 - a. Use the disease specific outbreak toolkits available online at:
<https://oepe.wv.gov/toolkits/pages/default.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 to confirm the outbreak. Work with your LHD to collect three to five laboratory specimens on recently ill persons.

Findings and Recommendations for Acute Care Hospitals and Outpatient Clinics:

1. Outbreaks should be reported immediately to the LHD according to the West Virginia Reportable Disease Rule. In 2023, there were only thirteen outbreaks reported from acute care facilities, which likely represents under reporting. 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 healthcare associated outbreaks.
4. Develop a multidisciplinary approach for outbreak investigations.
5. 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.
6. Provide routine education on appropriate infection control practices, including hand hygiene and transmission-based precautions and monitor for compliance.
7. Provide facility-wide education on safe injection practice, antimicrobial resistance, and appropriate antibiotics use at least once per year.

DIDE's Objectives:

The following are ongoing and new objectives for 2024 and beyond:

1. DIDE continues to provide feedback on outbreaks and outbreak investigations. In addition to the yearly outbreak report, DIDE plans to resume distribution of a monthly outbreak report. These reports will be shared with LHD, Regional Epidemiologists, and other stakeholders and posed on the website to monitor and improve the outbreak investigation process.
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 continues to make resources available for state and regional epidemiologists to attend national trainings and conferences on HAI and HAO.

5. Healthcare-associated outbreaks:

- According to the CDC, West Virginia continues to be among the states with the highest antibiotic prescribing rates. DIDE 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 and other partner organizations.
- DIDE will continue to provide annual MDRO surveillance reports.