



# WEST VIRGINIA OUTBREAK REPORT 2018-2022

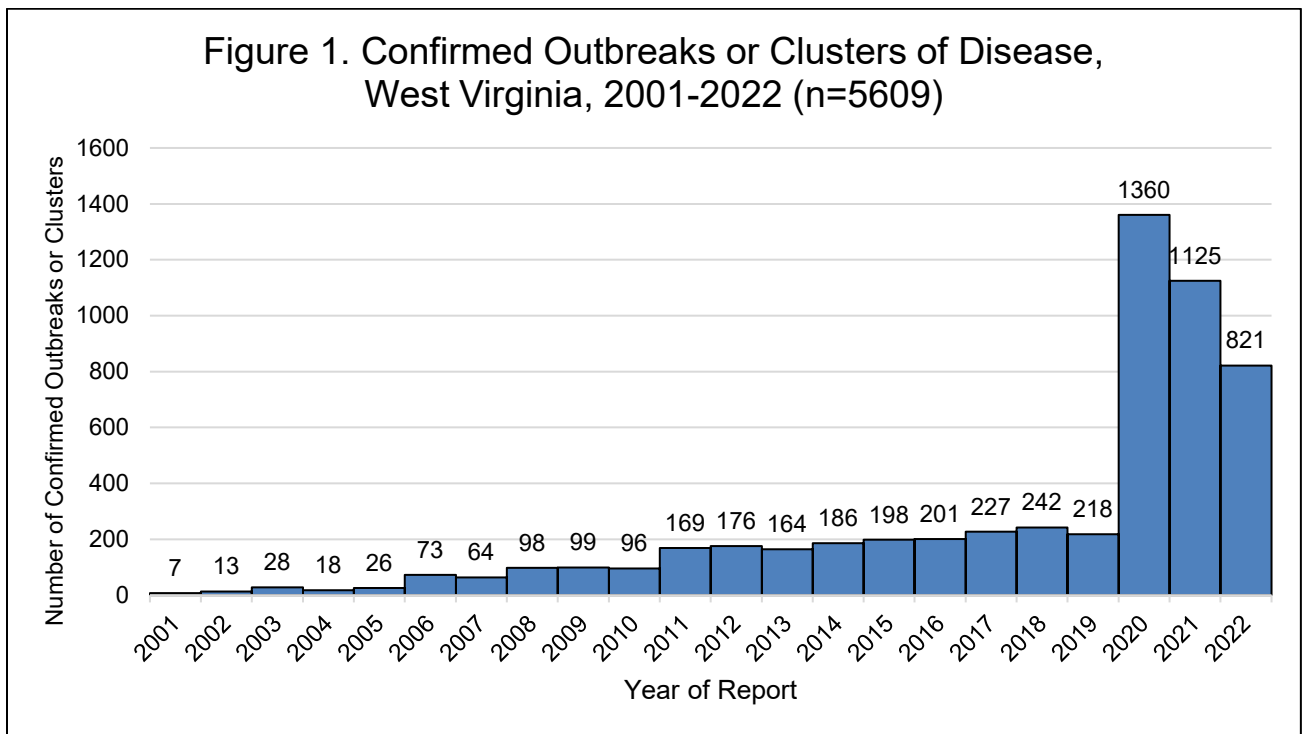
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## Introduction

In West Virginia, outbreaks and clusters of any disease or illness in any setting are immediately reportable to the Local Health Department (LHD) per the Reportable Disease Rule (§64CSR7). LHD investigate and report outbreaks in collaboration with regional epidemiologists and the West Virginia Department of Health and Human Resources (DHHR), 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 has increased over 500% from 2019 to 2020, as a result of the 2019 Coronavirus Pandemic. In 2020, there were 1360 outbreaks compared to 218 in 2019, (Figure 1). Although the number of outbreaks has decreased since that peak in 2020, it remains significantly elevated compared to pre-pandemic years.



## Methods:

Outbreak data were compiled in Microsoft Excel. Data collected include information on outbreak type and setting, reporting county and region, time of reporting to LHD and BPH, clinical diagnosis, laboratory information and specific pathogens, and mode of transmission. Data were analyzed in Epi Info™.

## **Outbreak Performance Measures:**

The outbreak performance measures are specific data elements that are reviewed to evaluate the performance of outbreak response and identify specific needs for education and improvement. The current outbreak performance measures are:

1. Number of outbreaks reported by each county and region.
2. Proportion of outbreaks with complete and appropriate laboratory confirmation.
3. Time lag between notification of the appropriate agencies:
  1. Local health department
  2. Division of Infectious Disease Epidemiology (DIDE) by the local health department
4. Number of final outbreak reports generated by each county that contain the minimal requirements set by CDC.

## **2018 Results**

In 2018, there were 259 outbreaks reported to LHD. Of these, 242 (93%) were confirmed as outbreaks or clusters of disease, and the remainder were investigated and determined not to be outbreaks.

### **Outbreaks by Reporting Counties/Regions:**

Outbreaks were reported from 48 counties and 6 outbreaks involved multiple counties (Table 1). Kanawha county had the highest number of outbreaks reported with 23 (9.5%), followed by Berkeley and Cabell counties with 17 (7%) each.

Table 1. Confirmed outbreaks by Reporting County, West Virginia, 2018 (n=242)

<b>County</b>	<b>Number of Outbreaks</b>
Berkeley	17
Boone	2
Braxton	1
Brooke	1
Cabell	17
Calhoun	1
Clay	1
Fayette	5
Gilmer	2
Grant	1
Greenbrier	12
Hancock	6
Hardy	1
Harrison	16
Jackson	1

Jefferson	5
Kanawha	23
Lewis	2
Lincoln	1
Logan	4
Marion	3
Marshall	8
Mason	8
McDowell	2
Mercer	13
Mineral	2
Monongalia	6
Monroe	5
Morgan	1
Ohio	4
Pendleton	1
Pleasants	1
Pocahontas	1
Preston	7
Putnam	10
Raleigh	4
Randolph	6
Ritchie	1
Roane	3
Summers	5
Taylor	4
Tyler	1
Upshur	7
Wayne	3
Webster	1
Wetzel	2
Wood	8
Multiple	6

**Surveillance Regions:**

All surveillance regions in the state reported outbreaks in 2018 (Figure 2.) A map of outbreaks by surveillance region is shown in Figure 3.

Figure 2. Confirmed Outbreaks by Region, West Virginia, 2018 (n=242)

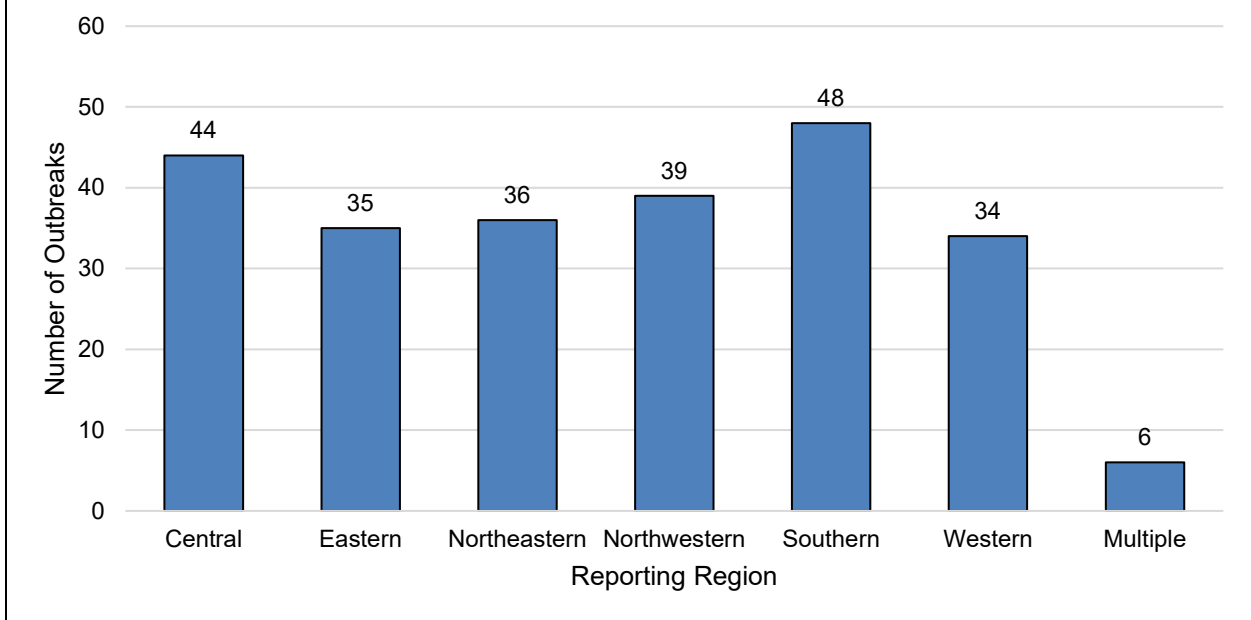
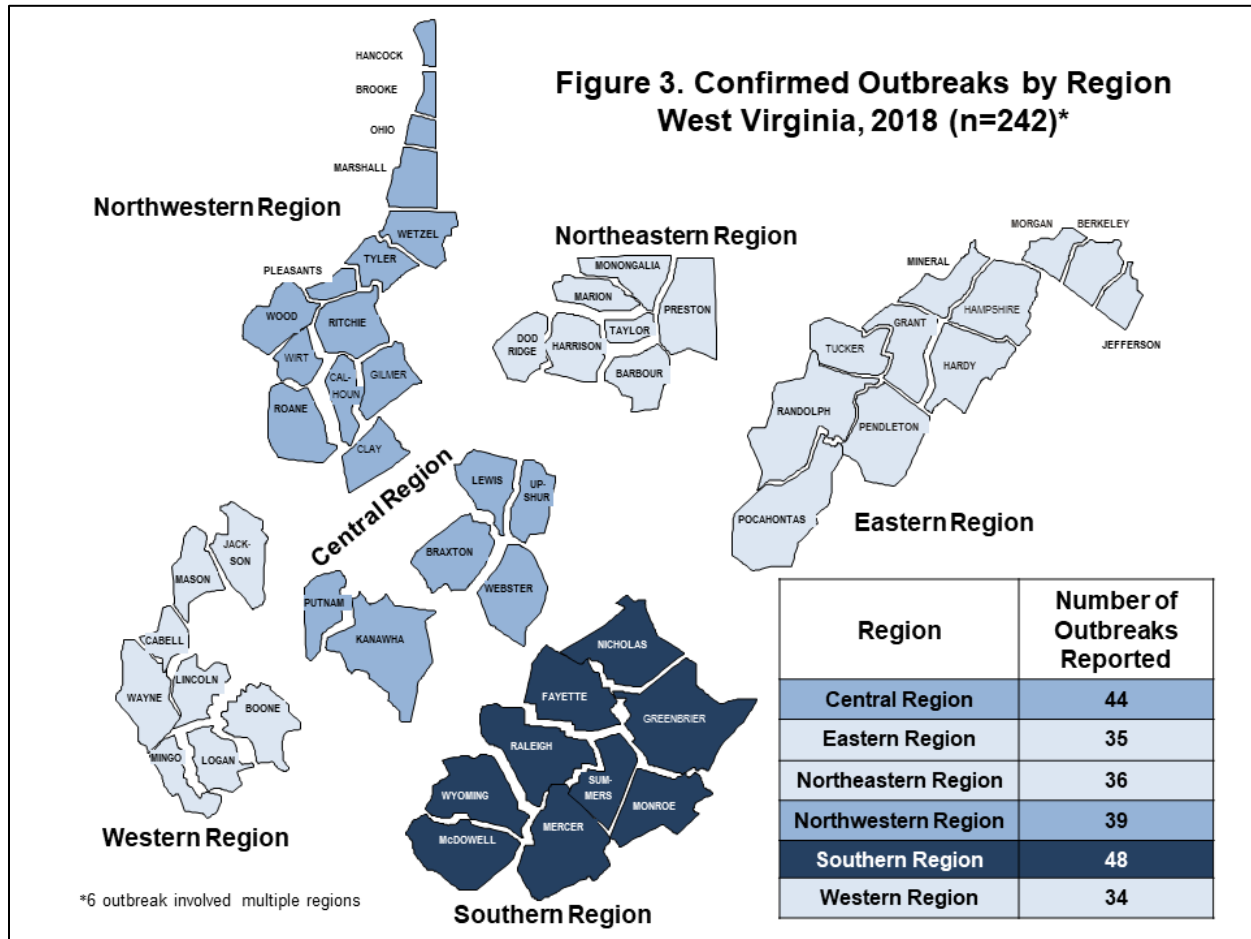


Figure 3. Confirmed Outbreaks by Region West Virginia, 2018 (n=242)\*



### **Type of Outbreaks:**

In 2018, the most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness (Table 2). Additional details on the outbreaks in each category can be seen in tables 3-7.

Table 2. Confirmed Outbreaks by Type, West Virginia, 2018

<b>Outbreak Type</b>	<b>Number of Outbreaks (n=242)</b>	<b>Percent</b>
Respiratory	136	56%
Enteric	72	30%
Rash	26	11%
Other	7	3%
Multi-Drug Resistant Organisms (MDRO)	1	<1%

Table 3. Outbreaks of Respiratory Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2018

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=136)</b>	<b>Percent</b>
Influenza	105	77%
Acute Respiratory Illness with undetermined etiology	16	12%
Respiratory syncytial virus (RSV)	6	4%
Human metapneumovirus (HMPV)	4	3%
Rhinovirus/enterovirus	3	2%
Legionella	1	1%
Pertussis	1	1%

Table 4. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2018

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=72)</b>	<b>Percent</b>
Acute Gastroenteritis	41	57%
Norovirus Gastroenteritis	18	25%
Salmonellosis	9	13%
Shiga toxin-producing E. coli (STEC)	2	3%
Acute Hepatitis A	1	1%
Campylobacteriosis	1	1%

Table 5. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2018

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=26)	Percent
Hand, Foot, and Mouth Disease	15	58%
Scabies	9	35%
Contact Dermatitis	2	7%

Table 6. Outbreaks Classified as Other by Etiology, West Virginia, 2018

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=7)	Percent
Conjunctivitis	4	57%
Scarlet Fever	1	14%
Post-injection Enterobacter Infection	1	14%
Brodifacoum Poisoning	1	14%

Table 7. MDRO Outbreaks by Etiology, West Virginia, 2018

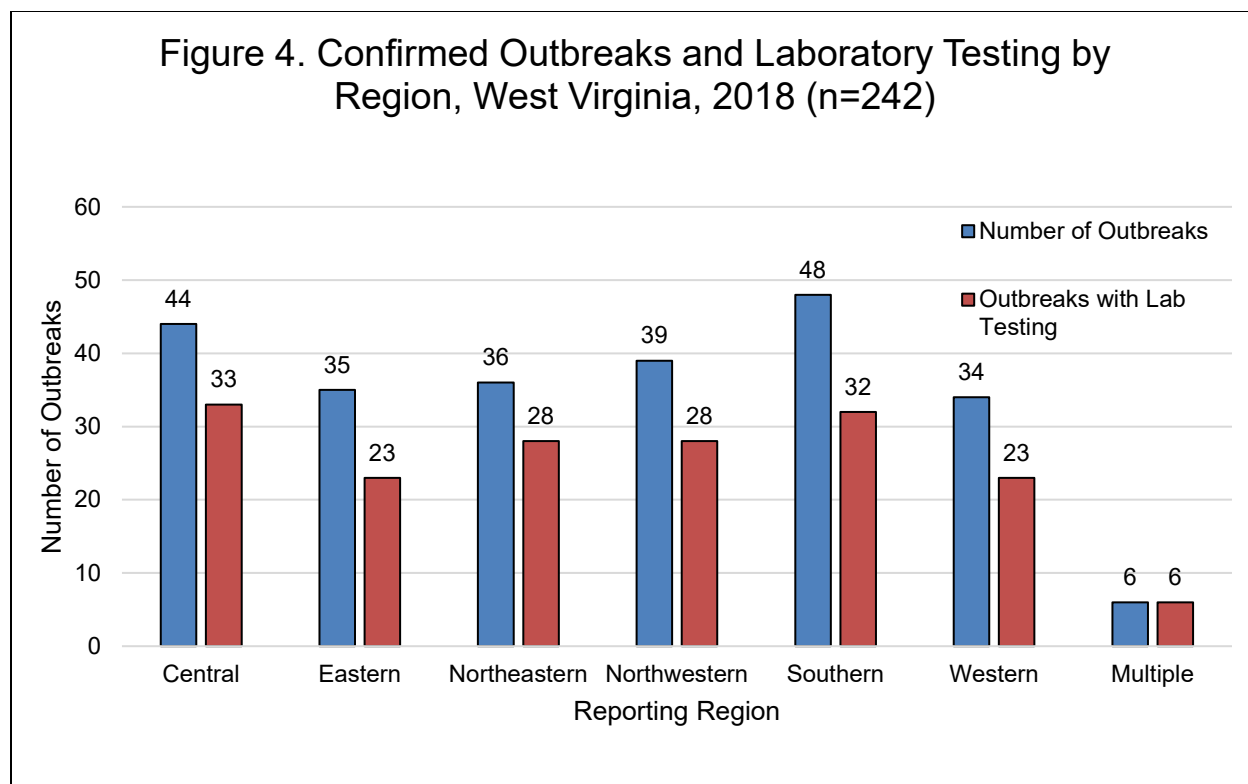
Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=1)	Percent
Methicillin-resistant Staphylococcus aureus (MRSA)	1	1

**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 is considered a performance measure for LHD. As shown in Figure 4, the percentage of outbreaks with laboratory testing in 2018 varied by region from 66% to 77%. Of the 242 confirmed outbreaks, 173 (71%) had laboratory testing.



Figure 4. Confirmed Outbreaks and Laboratory Testing by Region, West Virginia, 2018 (n=242)



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

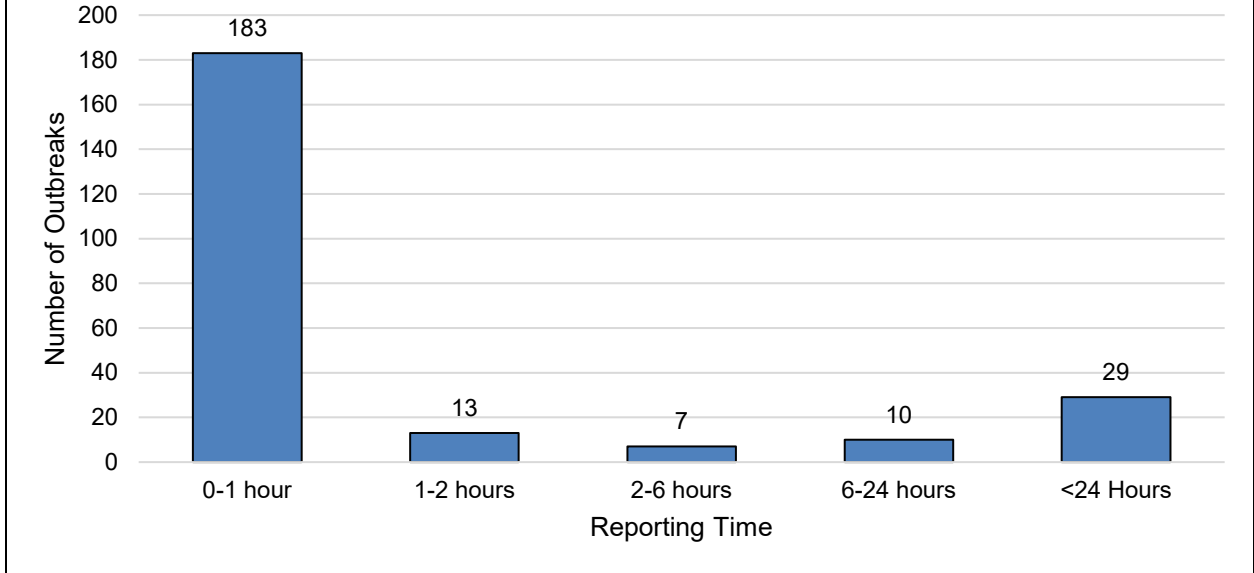
### **Outbreak Reporting Time:**

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, LHD are required to report suspected outbreaks or clusters to BPH, DIDE within 60 minutes.

To measure adherence to this requirement, the date and time outbreaks are reported to the LHD and to DIDE are recorded on a standard outbreak intake form. This enables the elapsed reporting time to be calculated.

In 2018, the date and time of report to the LHD and BPH were collected in all confirmed outbreaks. The range of time between the time the outbreak was reported to the LHD and the time the outbreak was reported to BPH was 0 to 19,995 minutes with a median of 25 minutes. Of the 242 confirmed outbreaks, same-day notification occurred for 213 (88%) outbreaks, and 183 (76%) were within 60 minutes (Figure 5).

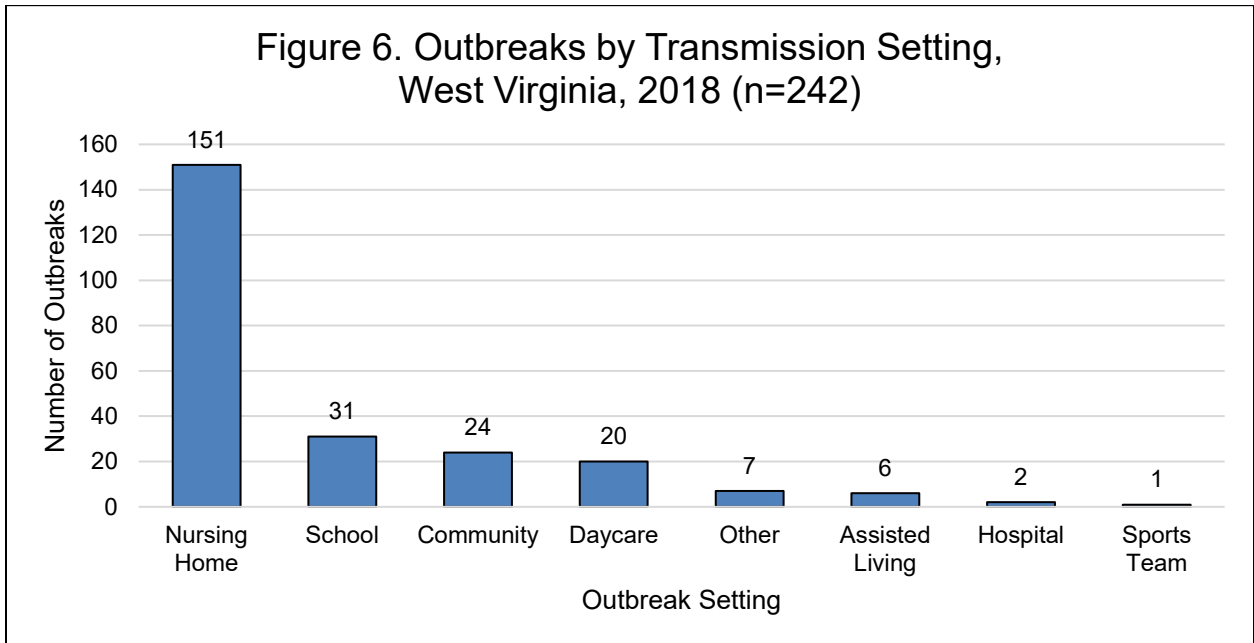
Figure 5. Elapsed Time for Reporting Outbreaks between State and Local Health Departments, West Virginia, 2018 (n=242)



**Outbreaks by Transmission Setting:**

The majority of outbreaks are reported from long-term care facilities, specifically, nursing homes (62%). Due to a high incidence of comorbidities and frequent healthcare visits across the continuum of healthcare settings, this population is at higher risk of poor outcomes during outbreaks. Figure 6 shows all confirmed outbreaks by setting.

Figure 6. Outbreaks by Transmission Setting, West Virginia, 2018 (n=242)



## 2019 Results

In 2019, there were 237 outbreaks reported to LHD. Of these, 218 (92%) were confirmed as outbreaks or clusters of disease, and the remainder were investigated and determined not to be outbreaks.

### Outbreaks by Reporting Counties/Regions:

Outbreaks were reported from 43 counties, and 5 outbreaks involved multiple counties (Table 8). Kanawha County had the highest number of outbreaks reported with 25 (11.5%), followed by Cabell with 16 (7.3%), and Berkeley with 14 (6.4%).

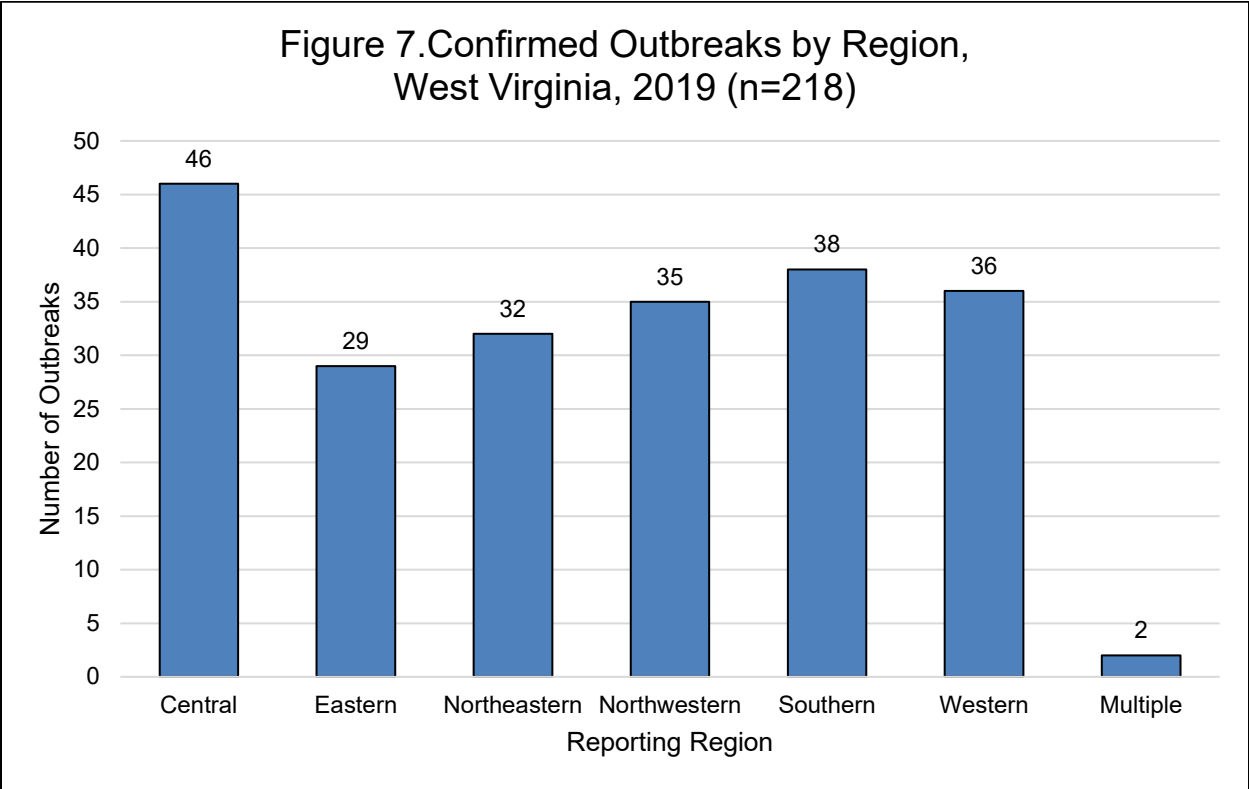
Table 8. Confirmed outbreaks by Reporting County, West Virginia, 2019 (n=218)

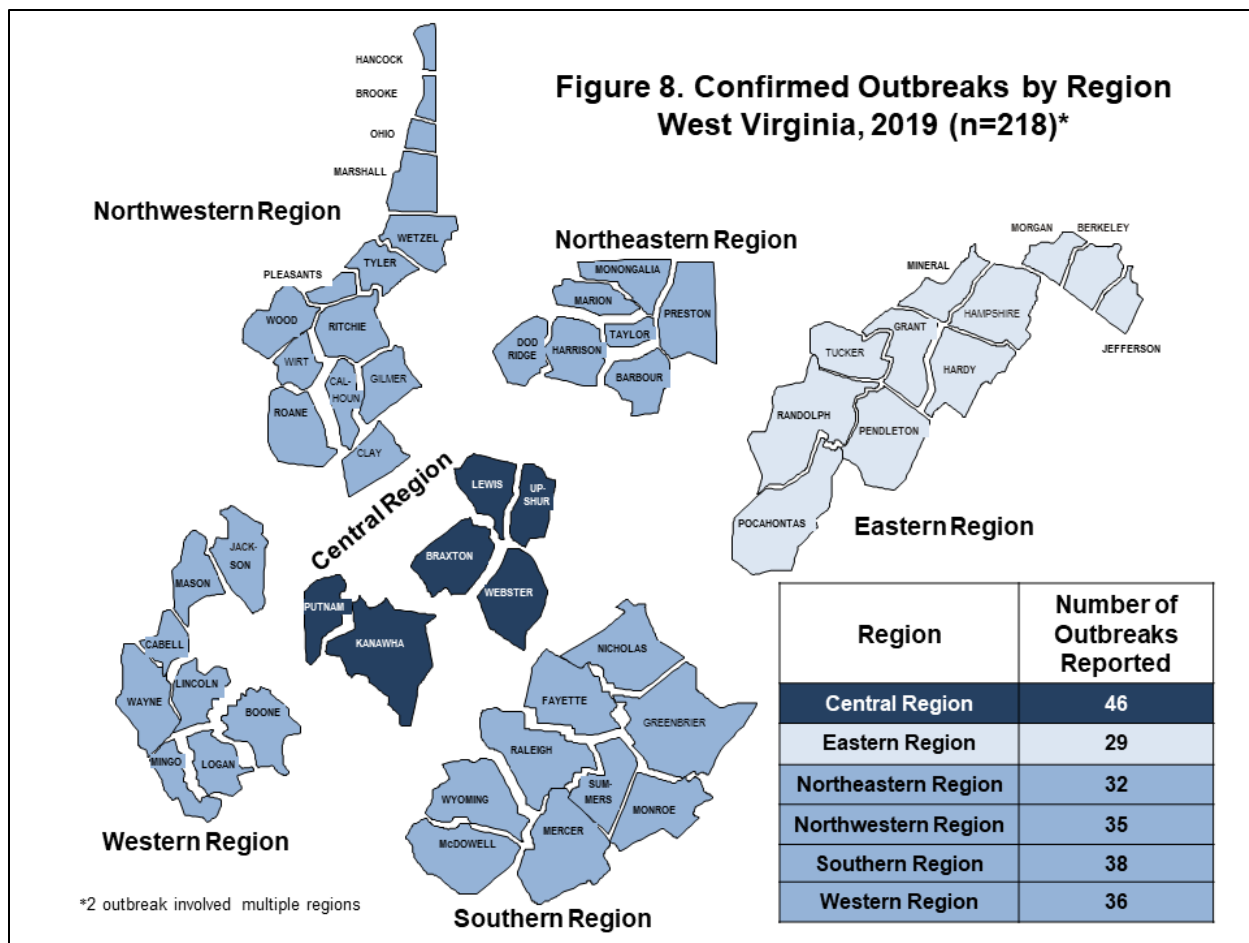
County	Number of Outbreaks
Berkeley	14
Boone	5
Braxton	1
Brooke	1
Cabell	16
Calhoun	1
Clay	4
Fayette	4
Gilmer	3
Grant	3
Greenbrier	9
Hancock	1
Harrison	10
Jackson	2
Jefferson	1
Kanawha	25
Lewis	2
Lincoln	3
Logan	4
Marion	6
Marshall	3
Mason	1
Mercer	11
Mineral	4
Mingo	1
Monongalia	5
Monroe	4
Ohio	8
Pendleton	2
Pleasants	1

Pocahontas	2
Preston	8
Putnam	7
Raleigh	8
Randolph	3
Ritchie	1
Roane	1
Summers	2
Taylor	3
Upshur	9
Wayne	4
Wetzel	1
Wood	9
Multiple	5

**Surveillance Regions:**

All surveillance regions in the state reported outbreaks in 2019 (Figure 2.) A map of outbreaks by surveillance region is shown in Figure 7.





**Type of Outbreaks:**

The most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness (Table 9). Additional details on the outbreaks in each category can be seen in tables 10-14.

Table 9. Confirmed Outbreaks by Type, West Virginia, 2019

Outbreak Type	Number of Outbreaks (n=218)	Percent
Respiratory	103	47%
Enteric	87	40%
Rash	18	8%
Multi-Drug Resistant Organisms (MDRO)	8	4%
Other	2	1%

Table 10. Outbreaks of Respiratory Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2018

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=103)	Percent
Influenza	73	71%
Acute Respiratory Illness with undetermined etiology	9	9%
Streptococcal Pharyngitis	6	6%
Rhinovirus/enterovirus	4	4%
Respiratory syncytial virus (RSV)	4	4%
Pertussis	3	3%
Parainfluenza	2	2%
Human metapneumovirus (HMPV)	1	1%
Legionellosis	1	1%

Table 11. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2019

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=87)	Percent
Acute Gastroenteritis	58	67%
Norovirus Gastroenteritis	21	24%
Salmonellosis	7	8%
Listeriosis	1	1%

Table 12. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2019

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=18)	Percent
Scabies	9	50%
Hand, Foot, and Mouth Disease	6	33%
Herpes Gladiatorum	1	5.5%
Fifth's Disease	1	5.5%
Impetigo	1	5.5%

Table 13. MDRO Outbreaks by Etiology, West Virginia, 2019

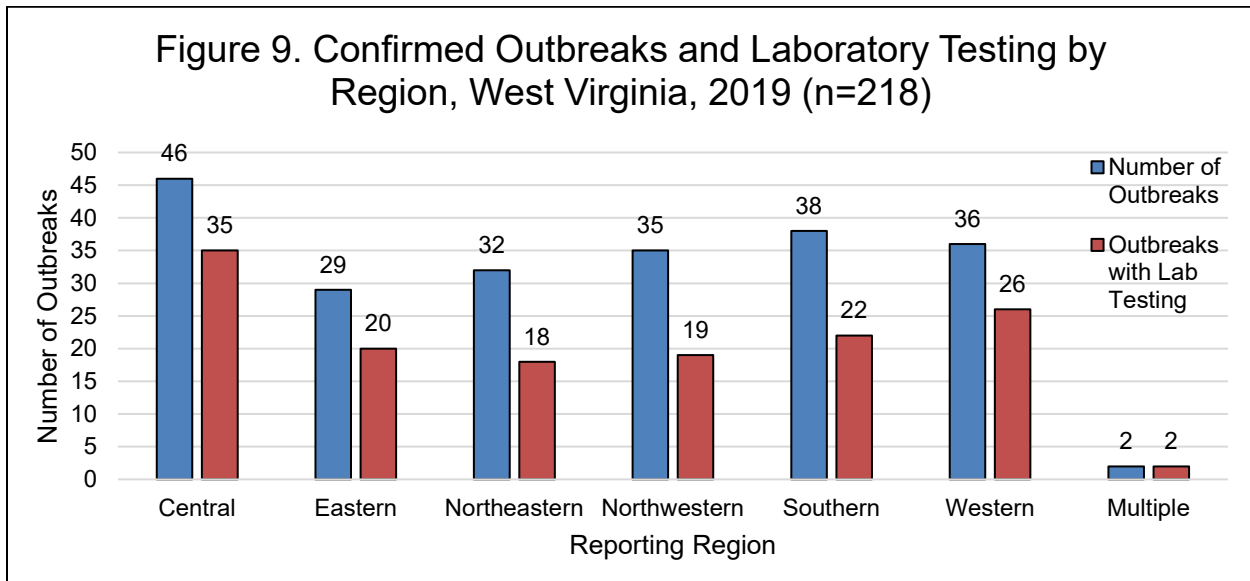
Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=8)	Percent
Clostridioides difficile (C. diff)	3	38%
Methicillin-resistant Staphylococcus aureus (MRSA)	2	25%
Multi-drug resistant Pseudomonas extended spectrum beta-lactamase Escherichia coli (ESBL E. Coli)	1	12%
Vancomycin-Intermediate Staphylococcus Aureus (VISA)	1	12%

Table 14. Outbreaks Classified as Other by Etiology, West Virginia, 2019

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=2)	Percent
Conjunctivitis	1	50%
Human Immunodeficiency Virus (HIV)	1	50%

**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 is considered a performance measure for LHD. As shown in Figure 9, the percentage of outbreaks with laboratory testing varied by region from 54% to 76%. Of the 218 confirmed outbreaks, 142 (65%) had laboratory testing.



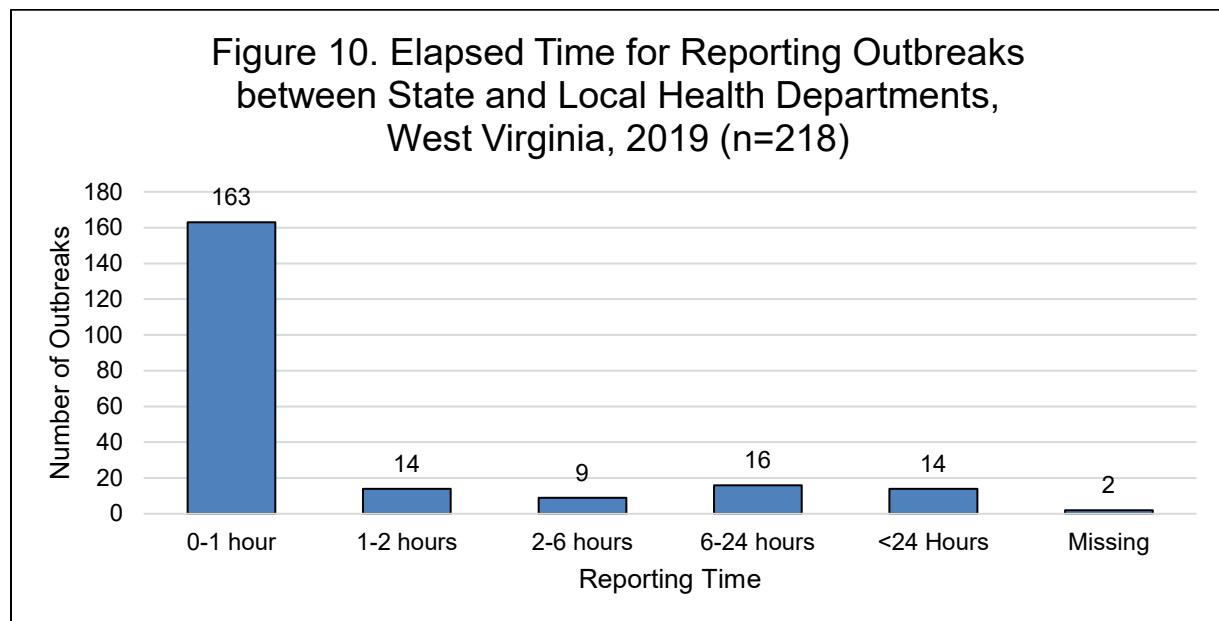
Some outbreaks do not require laboratory testing. Outbreaks such as scabies and hand, foot and mouth disease are often confirmed by clinical diagnosis and/or symptom presentation and lab testing is not required. However, all respiratory outbreaks should have laboratory testing and laboratory testing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

### **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, LHD are required to report suspected outbreaks or clusters to BPH, DIDE within 60 minutes.

To measure adherence to this requirement, the 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 2019, the date and time of report to the LHD and BPH were collected in 216 (99%) of the 218 confirmed outbreaks. The range of time between the time the outbreak was reported to the LHD and the time the outbreak was reported to BPH was 0 to 9,700 minutes with a median 30 minutes. Same-day notification occurred for 202 (93%) outbreaks and 163 (75%) were within 60 minutes (Figure 10).

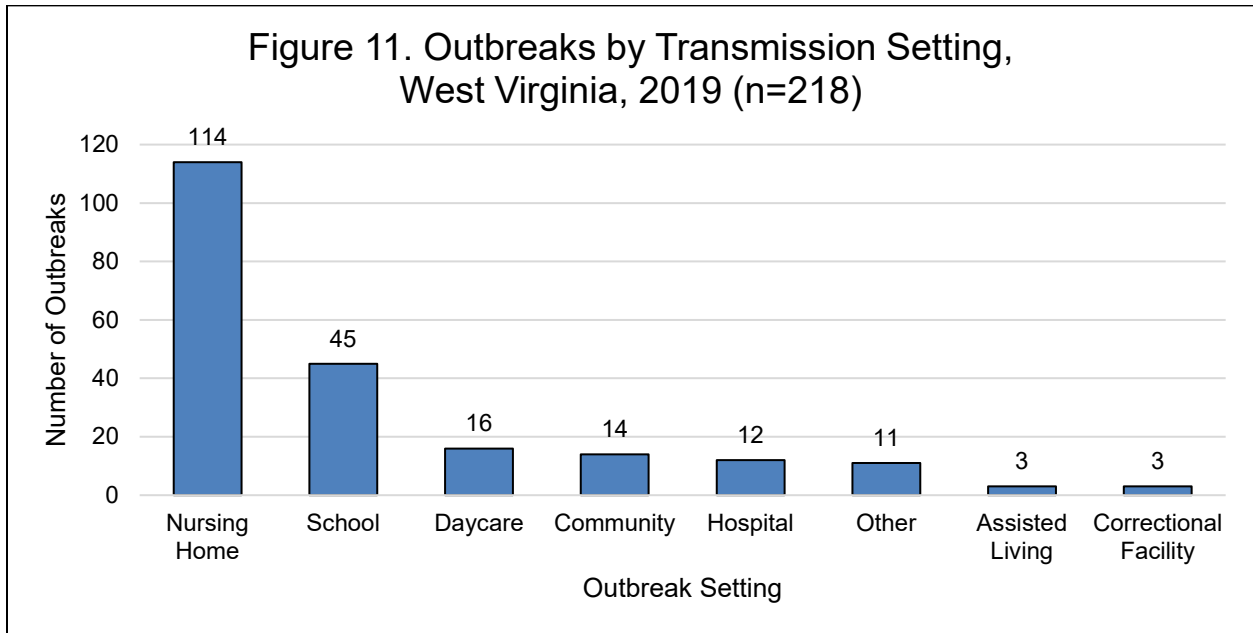


### **Outbreaks by Transmission Setting:**

The majority of outbreaks continue to be reported from long-term care facilities, specifically, nursing homes (62%). Due to a high incidence of comorbidities and frequent healthcare visits across the continuum of healthcare settings, this population is at higher risk of poor outcomes during outbreaks.



Figure 11 shows all confirmed outbreaks by setting.



## 2020 Results

In 2020, there were 1481 outbreaks reported to LHD. This dramatic increase is related to the COVID-19 pandemic. Of these, 1360 (92%) were confirmed as outbreaks or clusters of disease, and the remainder were investigated and determined not to be outbreaks based on the outbreak case definition for each setting and the prioritization of outbreak investigation during this surge.

### Outbreaks by Reporting Counties/Regions:

Outbreaks were reported from all 55 counties, and 2 outbreaks involved multiple counties (Table 15). Kanawha County had the highest number of outbreaks reported with 182 (11.5%), followed by Wood with 99 (7%), and Cabell with 95 (7.3%)

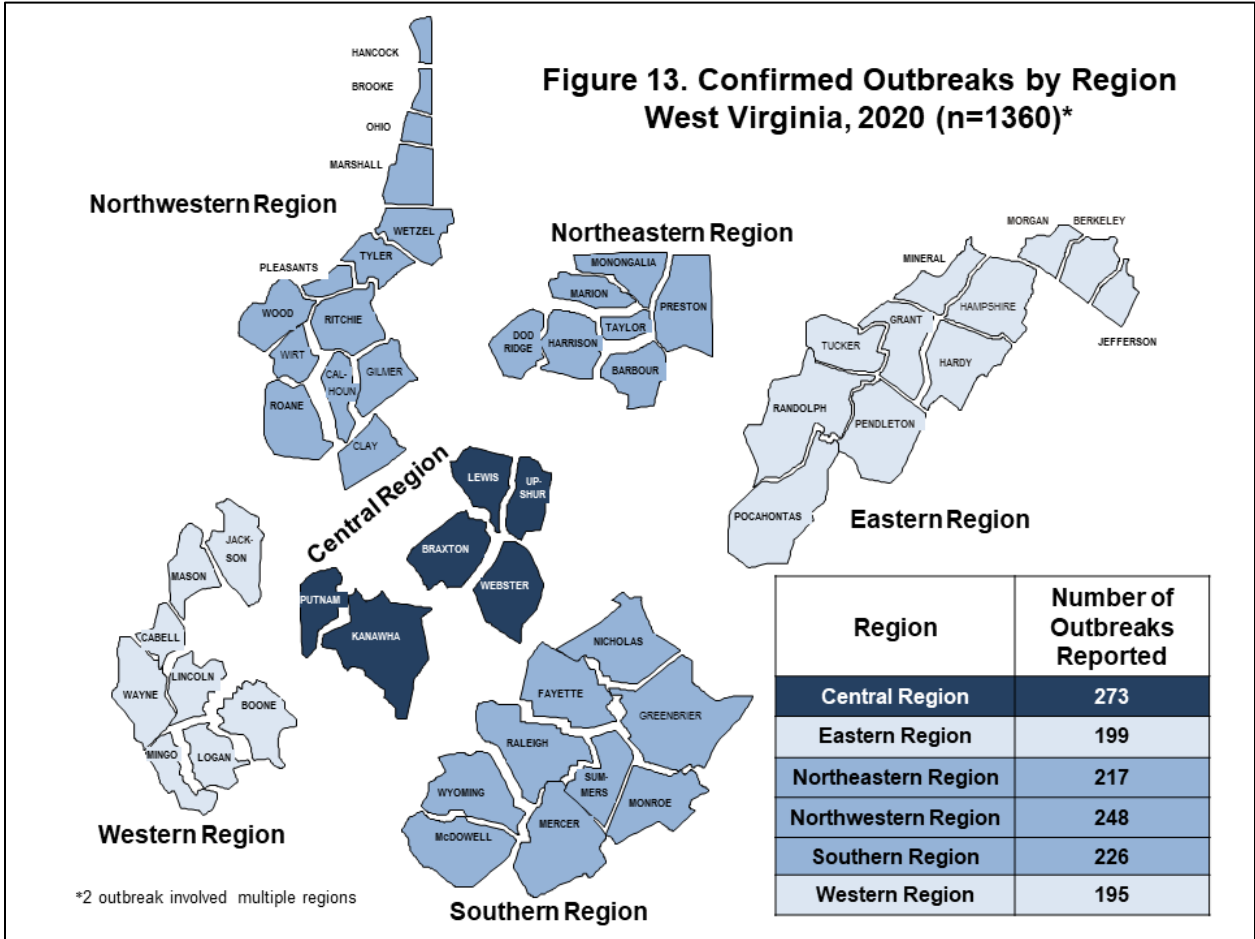
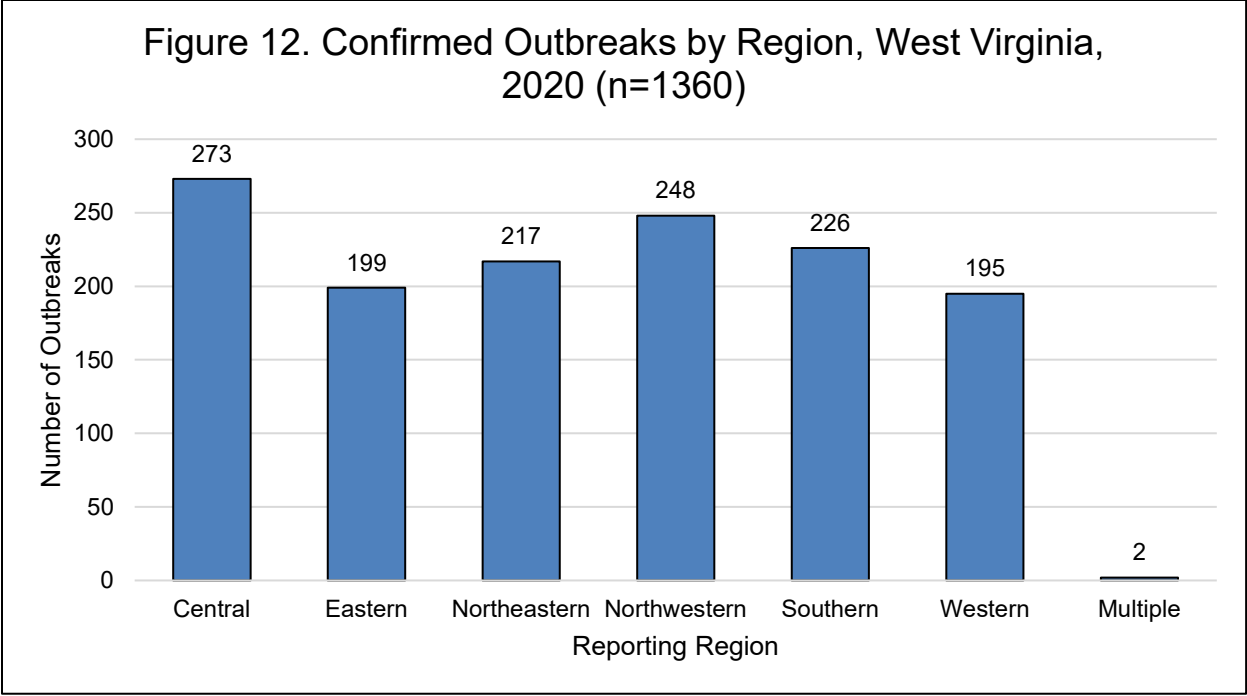
Table 15. Confirmed outbreaks by Reporting County, West Virginia, 2020 (n=1360)

County	Number of Outbreaks
Barbour	11
Berkeley	52
Boone	9
Braxton	7
Brooke	13
Cabell	95
Calhoun	3
Clay	9
Doddridge	9
Fayette	27
Gilmer	11
Grant	12
Greenbrier	33
Hampshire	16
Hancock	14
Hardy	9
Harrison	82
Jackson	21
Jefferson	20
Kanawha	182
Lewis	23
Lincoln	8
Logan	22
Marion	27
Marshall	20
Mason	11
McDowell	14

Mercer	39
Mineral	28
Mingo	12
Monongalia	46
Monroe	10
Morgan	12
Nicholas	10
Ohio	27
Pendleton	8
Pleasants	8
Pocahontas	5
Preston	27
Putnam	37
Raleigh	63
Randolph	24
Ritchie	8
Roane	14
Summers	12
Taylor	16
Tucker	13
Tyler	7
Upshur	22
Wayne	16
Webster	2
Wetzel	12
Wirt	3
Wood	99
Wyoming	18
Multiple	2

**Surveillance Regions:**

All surveillance regions in the state reported outbreaks in 2020 (Figure 12.) A map of outbreaks by surveillance region is shown in Figure 13.



### **Type of Outbreaks:**

In 2020, the most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness (Table 16). There were no MRDO outbreaks confirmed for the year. Additional details on the outbreaks in each category can be seen in tables 17-20.

Table 16. Confirmed Outbreaks by Type, West Virginia, 2020

<b>Outbreak Type</b>	<b>Number of Outbreaks (n=1360)</b>	<b>Percent</b>
COVID-19	1193	88%
Respiratory	119	9%
Enteric	39	3%
Rash	6	0%
Other	3	0%

Table 17. Outbreaks of Respiratory Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2020

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=119)</b>	<b>Percent</b>
Influenza	94	79%
Respiratory syncytial virus (RSV)	8	7%
Rhinovirus/enterovirus	6	5%
Acute Respiratory Illness with undetermined etiology	6	5%
Streptococcal Pharyngitis	4	3%
Pertussis	1	1%

Table 18. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2020

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=39)</b>	<b>Percent</b>
Acute Gastroenteritis	27	69%
Norovirus Gastroenteritis	8	21%
Salmonellosis	2	5%
Cryptosporidiosis	1	2.5%
Cyclosporiasis	1	2.5%

Table 19. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2020

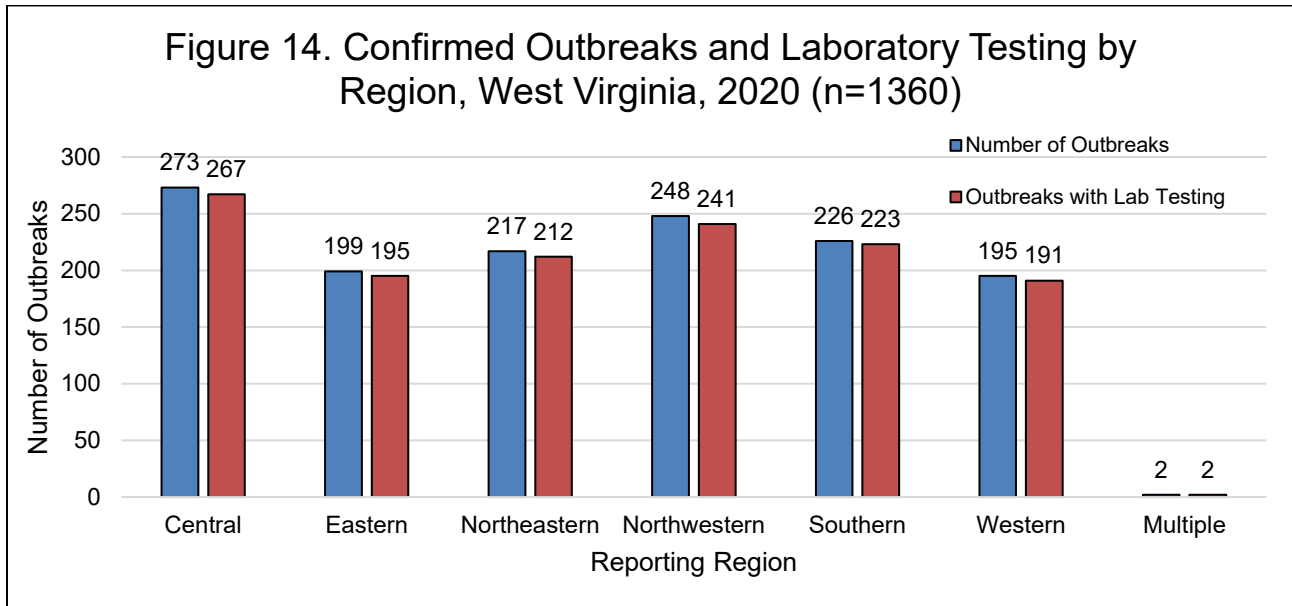
Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=6)	Percent
Scabies	3	50%
Hand, Foot, and Mouth Disease	3	50%

Table 20. Outbreaks Classified as Other by Etiology, West Virginia, 2020

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=3)	Percent
Conjunctivitis	3	100%

**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 is considered a performance measure for LHD. As shown in Figure 14, the percentage of outbreaks with laboratory testing varied by region from 97% to 99%. Of the 1360 confirmed outbreaks, 1331 (98%) had laboratory testing.



**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, LHD are required to report suspected outbreaks or clusters to BPH, DIDE within 60 minutes.

Due to the surge in outbreaks related to COVID-19 and changes in the outbreak management system, the data for elapsed reporting time for 2020 are incomplete and unable to be analyzed.

**Infection control assessment and response (ICAR):**

The basic elements of an infection prevention program are designed to prevent the spread of infection in healthcare 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 healthcare personnel is reduced. Infection control assessment and response (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
- Based upon data analysis

Table 21. ICAR Consultations by Facility Type, West Virginia, 2020

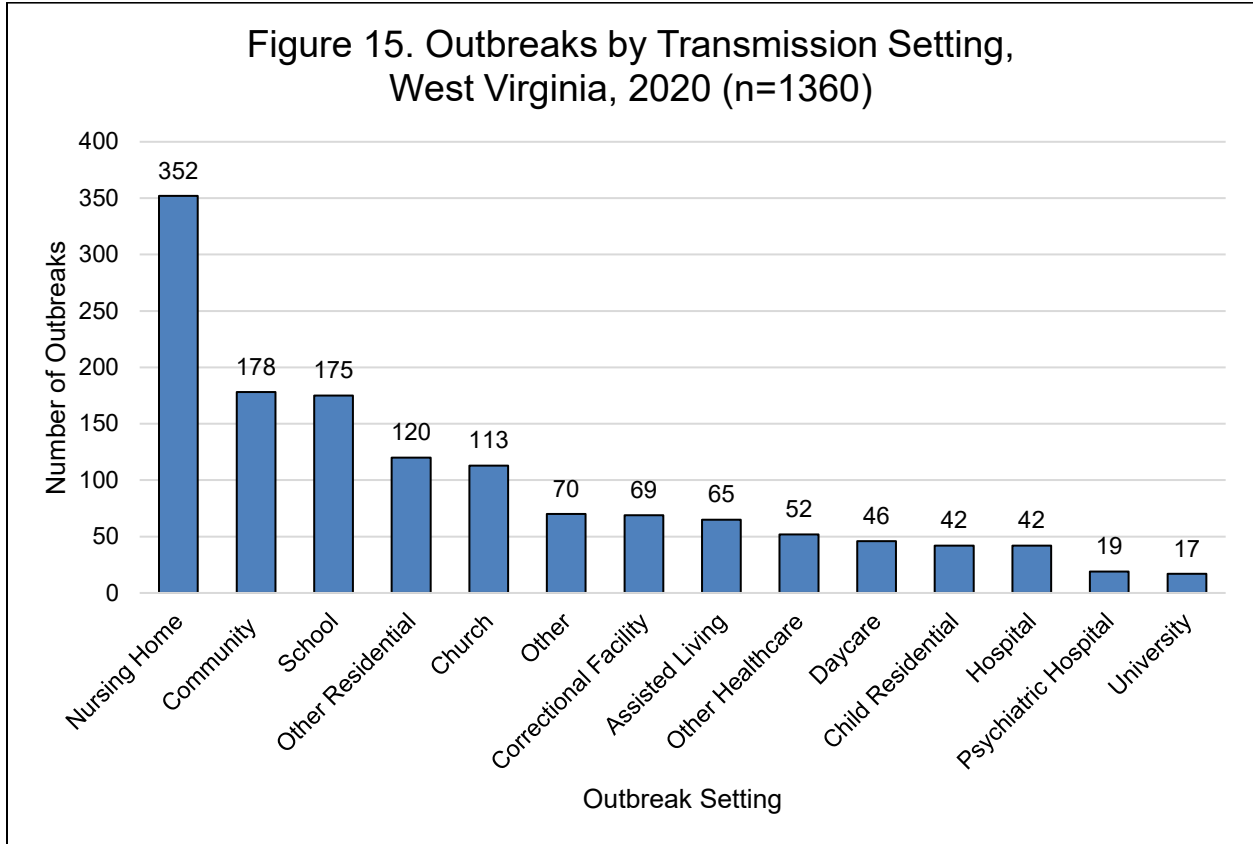
Facility type	Preventive	Response	Total
Nursing Home	85	98	183
Assisted Living	9	26	35
Psychiatric Facility	2	5	7
Other	6	0	6
Dialysis Center	3	0	3
Rehabilitation Facility	0	2	2
Correctional Facility	0	2	2
Acute Care Hospital	0	1	1
Long Term Acute Care Hospital	0	1	1

**Outbreaks by Transmission Setting:**

Nursing homes continue to be the most frequent setting for outbreaks (26%). Due to a high incidence of comorbidities and frequent healthcare visits across the continuum of healthcare settings, this population is at higher risk of poor outcomes during outbreaks.

As a result of this increased risk, BPH DIDE prioritizes infection control assessments in these facilities to identify gaps in infection control practices and assist with mitigation of gaps identified.

Figure 15 shows all confirmed outbreaks by setting.





## 2021 Results

In 2021, there were 1200 outbreaks reported to LHD. The number of outbreaks reported remains elevated related to the COVID-19 pandemic. Of the reported outbreaks, 1125 (94%) were confirmed as outbreaks or clusters of disease and the remainder were investigated and determined not to be outbreaks based on the outbreak case definition for each setting and the prioritization of outbreak investigation during this surge.

### Outbreaks by Reporting Counties/Regions:

In 2021, outbreaks were reported from 54 (98%) counties and 2 outbreaks involved multiple counties (Table 21). Kanawha County had the highest number of outbreaks reported with 134 (12%), followed by Cabell with 79 (7%), and Wood with 76 (6.7%)

Table 22. Confirmed Outbreaks by Reporting County, West Virginia, 2021 (n=1125)

County	Number of Outbreaks
Barbour	8
Berkeley	58
Boone	20
Braxton	13
Brooke	2
Cabell	79
Calhoun	16
Clay	16
Doddridge	10
Fayette	32
Gilmer	7
Grant	9
Greenbrier	17
Hampshire	17
Hancock	11
Hardy	9
Harrison	62
Jackson	11
Jefferson	17
Kanawha	134
Lewis	18
Lincoln	9
Logan	24
Marion	28
Marshall	6
Mason	14

McDowell	5
Mercer	35
Mineral	12
Mingo	5
Monongalia	25
Monroe	10
Morgan	5
Nicholas	24
Ohio	25
Pendleton	6
Pleasants	6
Pocahontas	12
Preston	18
Putnam	35
Raleigh	45
Randolph	25
Ritchie	11
Roane	14
Summers	8
Taylor	14
Tucker	7
Upshur	13
Wayne	20
Webster	8
Wetzel	9
Wirt	2
Wood	76
Wyoming	1
Multiple	2

**Surveillance Regions:**

All surveillance regions in the state reported outbreaks in 2021 (Figure 16.) A map of outbreaks by surveillance region is shown in Figure 17.

Figure 16. Confirmed Outbreaks by Region, West Virginia, 2021 (n=1125)

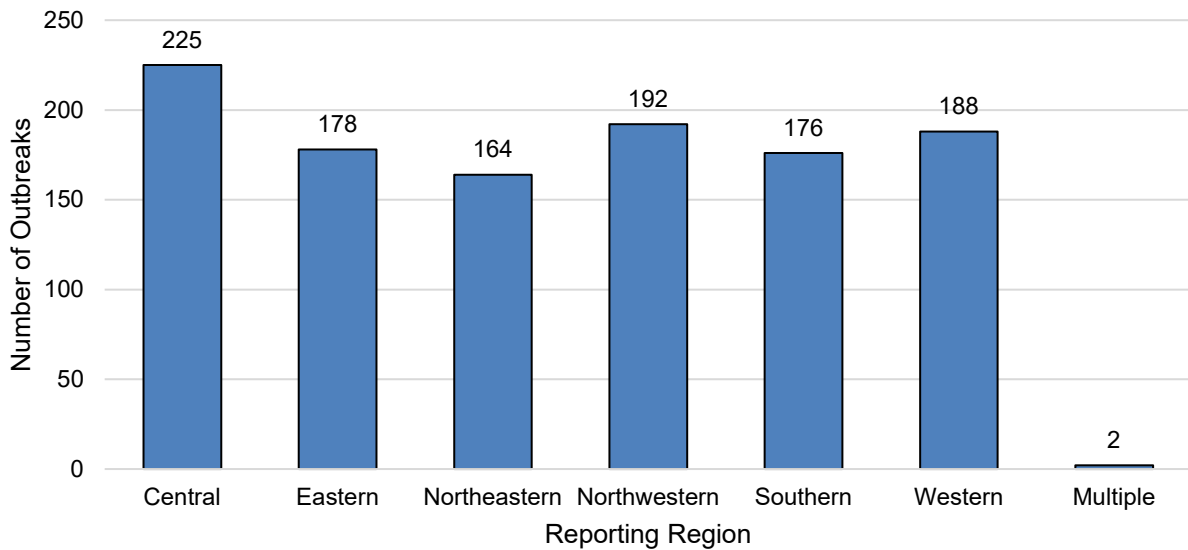
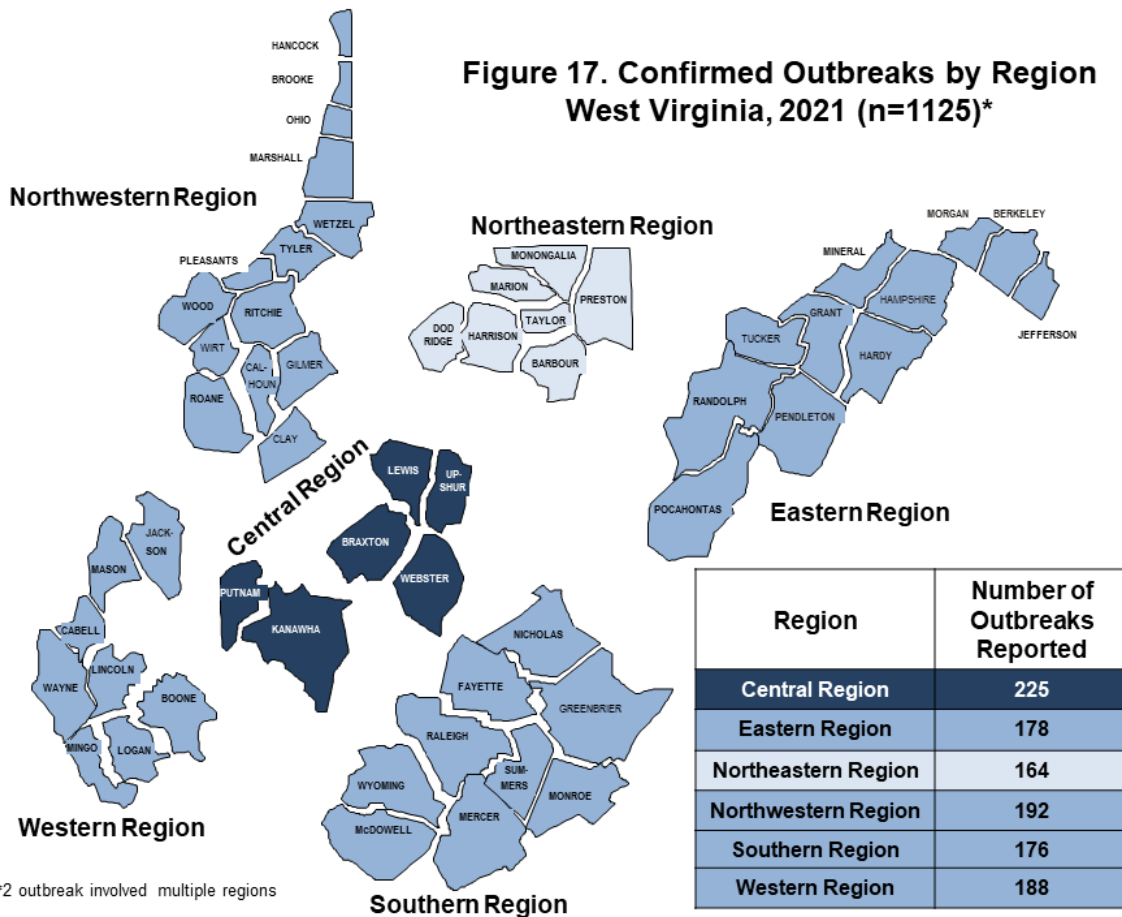


Figure 17. Confirmed Outbreaks by Region West Virginia, 2021 (n=1125)\*



### **Type of Outbreaks:**

The most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness (Table 22). There were no outbreaks classified as other. Additional details on the outbreaks in each category can be seen in tables 23-26.

Table 23. Confirmed Outbreaks by Type, West Virginia, 2021

<b>Outbreak Type</b>	<b>Number of Outbreaks (n=1125)</b>	<b>Percent</b>
COVID	1029	91%
Enteric	38	3%
Respiratory	31	3%
Rash	26	2%
MDRO	1	<1%

Table 24. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2021

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=38)</b>	<b>Percent</b>
Acute Gastroenteritis	21	55%
Norovirus Gastroenteritis	10	26%
Salmonellosis	4	11%
Cryptosporidiosis	1	2.6%
Campylobacteriosis	1	2.6%
Hepatitis A	1	2.6%

Table 25. Outbreaks of Respiratory Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2021

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=31)</b>	<b>Percent</b>
Respiratory syncytial virus (RSV)	20	65%
Influenza	7	23%
Acute Respiratory Illness with undetermined etiology	2	6%
Parainfluenza	1	3%
Rhinovirus/enterovirus	1	3%

Table 26. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2021

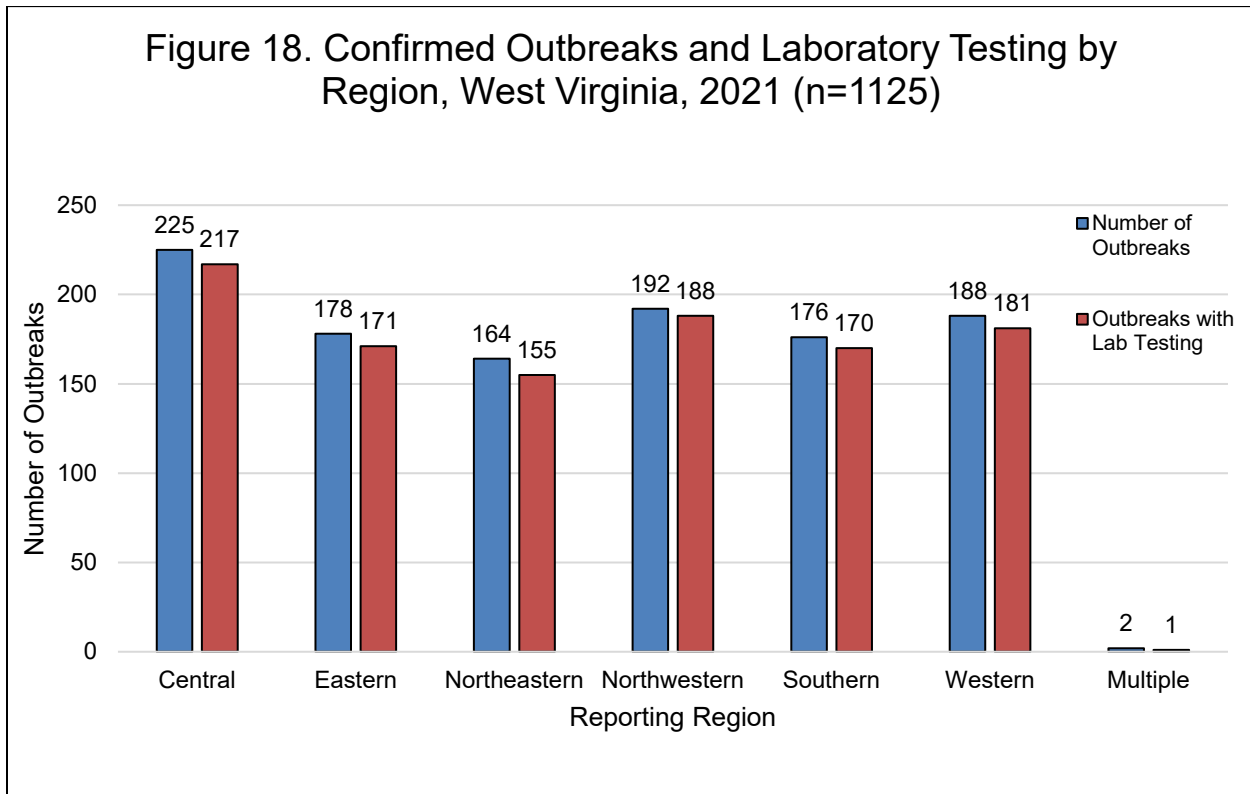
Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=26)	Percent
Hand, Foot, and Mouth Disease	15	58%
Scabies	8	31%
Herpes Gladiatorum	2	8%
Impetigo	1	4%

Table 27. MDRO Outbreaks by Etiology, West Virginia, 2021

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=8)	Percent
Clostridioides difficile (C. diff)	1	100%

**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 18, the percentage of outbreaks with laboratory testing varied by region from 97% to 99%. Of the 1360 confirmed outbreaks, 1331 (98%) had laboratory testing.



### **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, LHD are required to report suspected outbreaks or clusters to BPH, DIDE within 60 minutes.

Due to the surge in outbreaks related to COVID-19 and changes in the outbreak management system, the data for elapsed reporting time for 2021 is incomplete and unable to be analyzed.

### **ICAR:**

The basic elements of an infection prevention program are designed to prevent the spread of infection in healthcare 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 healthcare personnel is reduced. The ICAR 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
- Based upon data analysis

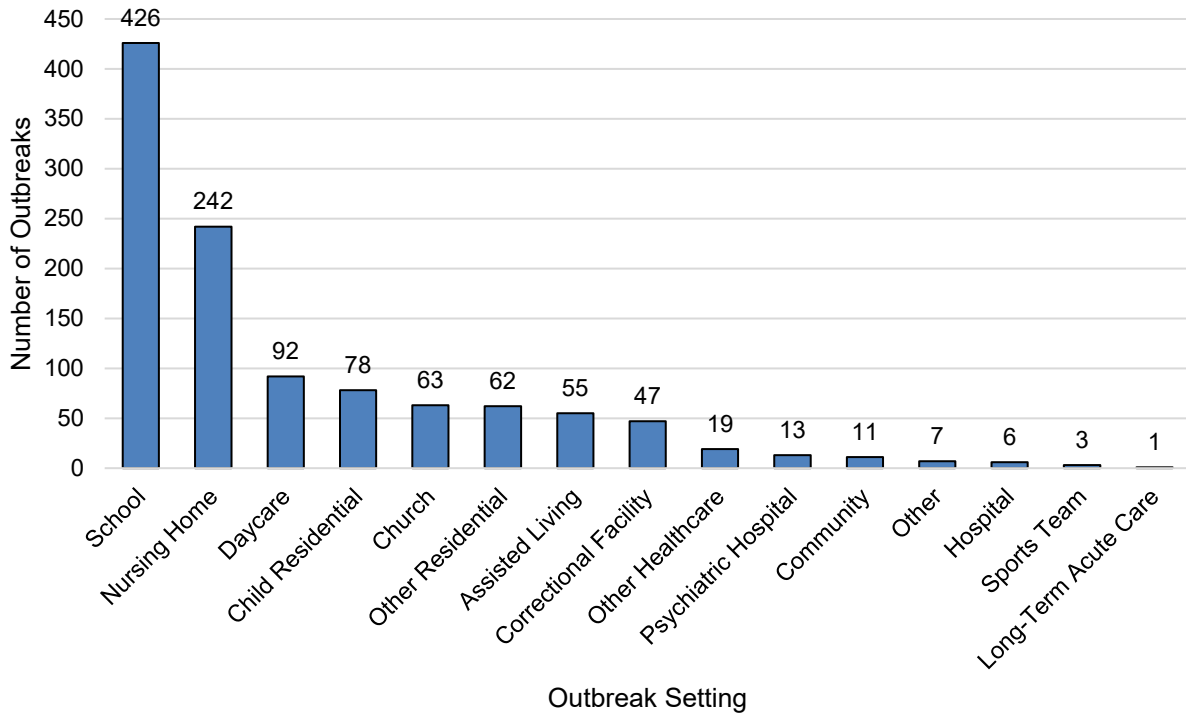
Table 28. ICAR Consultations by Facility Type, West Virginia, 2021

Facility type	Preventive	Response	Total
Nursing Home	40	116	156
Assisted Living	59	30	89
Dialysis Center	23	0	23
Rehabilitation Facility	0	4	4
Psychiatric Facility	0	4	4
Acute Care Hospital	0	2	2
Long Term Acute Care Hospital	0	0	0
Outpatient	0	0	0
Other	0	0	0

### **Outbreaks by Transmission Setting:**

In 2021, the most commonly reported outbreak setting was schools (38%). The majority of outbreaks reported in schools were COVID-19. The COVID-19 outbreak definition for school settings during this time period was 2 or more epi-linked cases, and the high number of outbreaks reflects the widespread community transmission occurring during this time period. Figure 6 shows all confirmed outbreaks by setting.

Figure 19. Outbreaks by Transmission Setting, West Virginia, 2021 (n=1125)



## 2022 Results

In 2022, there were 887 outbreaks reported to LHD. The number of outbreaks reported remains elevated related to the COVID-19 pandemic. Of the reported outbreaks, 821 (93%) were confirmed as outbreaks or clusters of disease and the remainder were investigated and determined not to be outbreaks based on the outbreak case definition for each setting and the prioritization of outbreak investigation during this surge.

### Outbreaks by Reporting Counties/Regions:

In 2022, outbreaks were reported from 54 (98%) counties and 3 outbreaks involved multiple counties (Table 27). Kanawha County had the highest number of outbreaks reported with 97 (12%), followed by Cabell with 66 (8%), and Harrison with 47 (6%).

Table 29. Confirmed Outbreaks by Reporting County, West Virginia, 2022 (n=821)

County	Number of Outbreaks
Barbour	6
Berkeley	31
Boone	6
Braxton	6
Brooke	12
Cabell	66
Calhoun	2
Clay	8
Fayette	30
Gilmer	2
Grant	3
Greenbrier	32
Hampshire	8
Hancock	17
Hardy	5
Harrison	47
Jackson	12
Jefferson	13
Kanawha	97
Lewis	15
Lincoln	4
Logan	4
Marion	22
Marshall	8
Mason	9
McDowell	5



Mercer	28
Mineral	16
Mingo	4
Monongalia	22
Monroe	8
Morgan	6
Nicholas	9
Ohio	21
Pendleton	4
Pleasants	6
Pocahontas	8
Preston	24
Putnam	28
Raleigh	26
Randolph	26
Ritchie	4
Roane	4
Summers	7
Taylor	4
Tucker	3
Tyler	1
Upshur	17
Wayne	9
Webster	5
Wetzel	5
Wirt	5
Wood	41
Wyoming	7
Multicounty	3

**Surveillance Regions:**

All surveillance regions in the state reported outbreaks in 2022 (Figure 20.) A map of outbreaks by surveillance region is shown in Figure 21.

Figure 20. Confirmed Outbreaks by Region, West Virginia, 2022 (n=821)

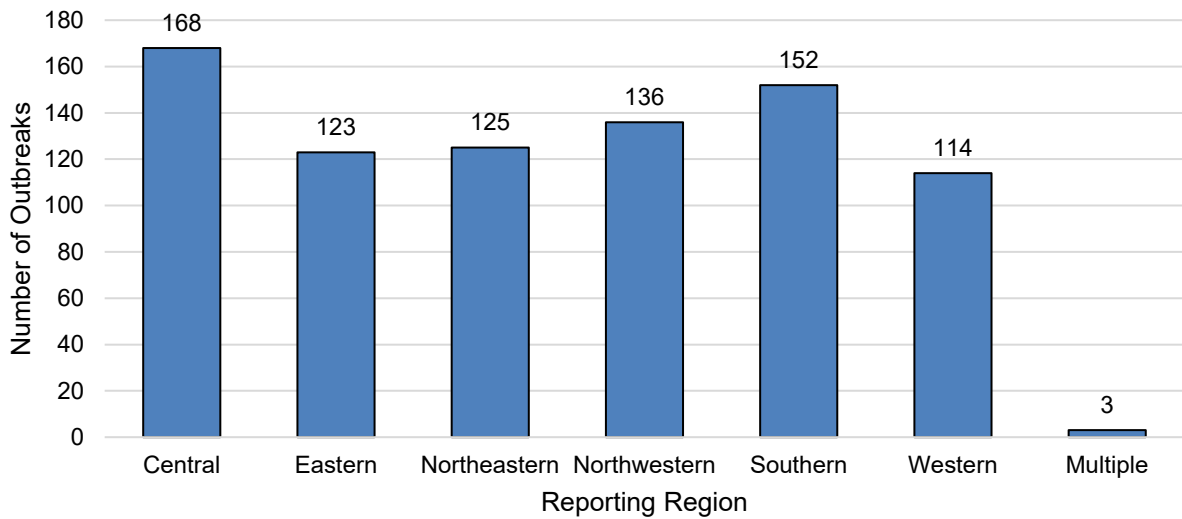
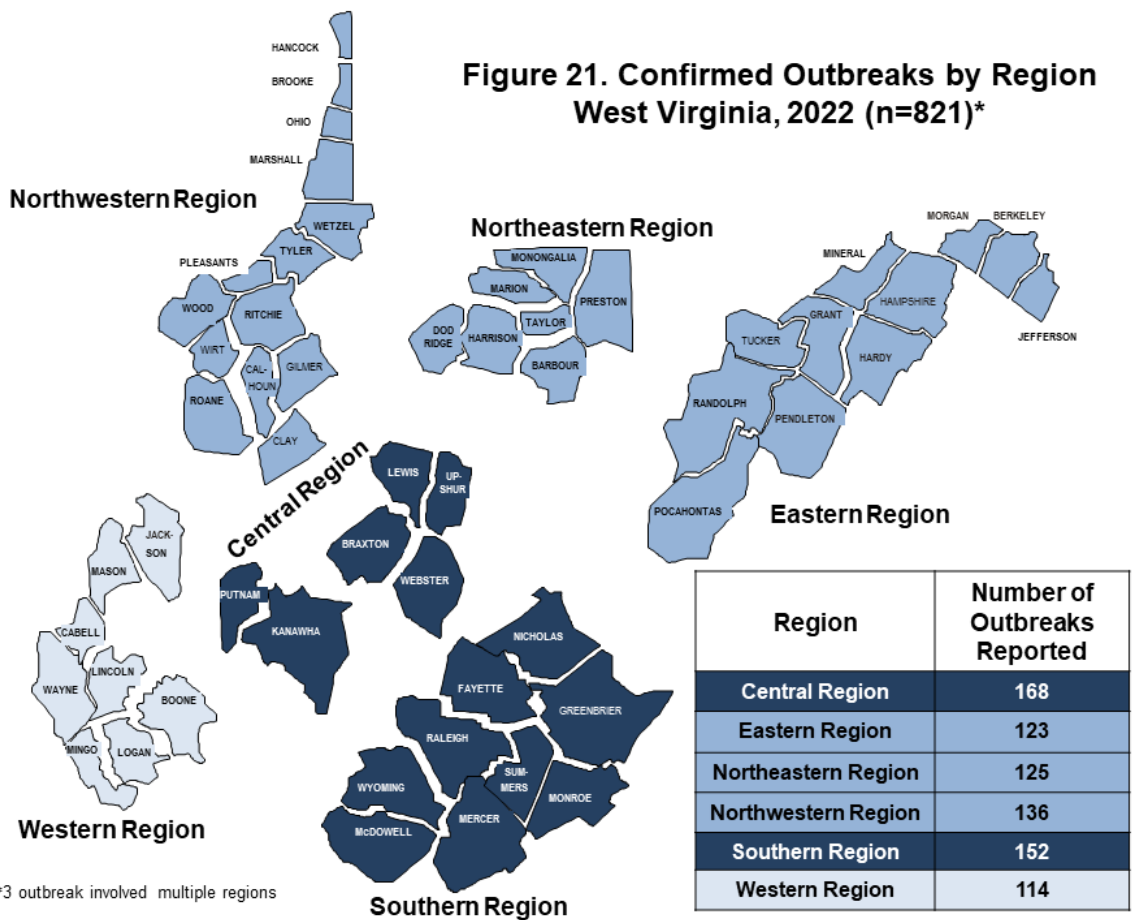


Figure 21. Confirmed Outbreaks by Region West Virginia, 2022 (n=821)\*



## **Type of Outbreaks:**

The most common type of outbreaks involved respiratory illness, followed by enteric illness, and rash illness (Table 28). There were no outbreaks reported as MDRO. Additional details on the outbreaks in each category can be seen in tables 29-32.

Table 30. Confirmed Outbreaks by Type, West Virginia, 2022

<b>Outbreak Type</b>	<b>Number of Outbreaks (n=821)</b>	<b>Percent</b>
COVID-19	640	78%
Respiratory	115	14%
Enteric	55	7%
Rash	9	1%
Other	2	<1%

Table 31. Outbreaks of Respiratory Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2022

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=115)</b>	<b>Percent</b>
Influenza	77	67%
Respiratory syncytial virus (RSV)	22	19%
Acute Respiratory Illness with undetermined etiology	4	3%
Parainfluenza	4	3%
Acute Respiratory Illness with multiple etiologies	2	2%
Human metapneumovirus	2	2%
Rhinovirus/enterovirus	2	2%
Pertussis	1	1%
Streptococcal Pharyngitis	1	1%

Table 32. Outbreaks of Enteric Disease by Clinical Syndrome/Etiologic Agent, West Virginia, 2022

<b>Clinical Syndrome/Etiologic Agent</b>	<b>Number of Outbreaks (n=55)</b>	<b>Percent</b>
Acute Gastroenteritis	31	57%
Norovirus Gastroenteritis	13	22%
Salmonellosis	6	11%
Cryptosporidiosis	1	2%
Vibriosis	1	2%
E. Coli	1	2%
Giardiasis	1	2%
Rotavirus	1	2%

Table 33. Outbreaks of Rash Illness by Clinical Syndrome/Etiologic Agent, West Virginia, 2022

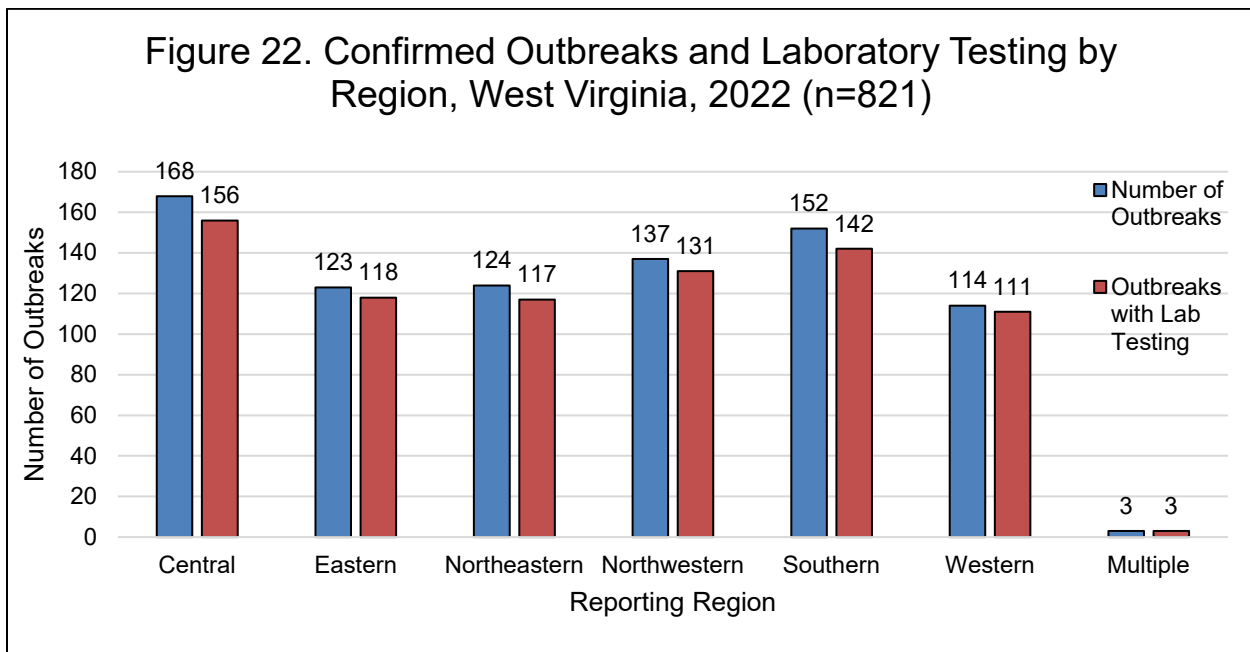
Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=9)	Percent
Hand, Foot, and Mouth Disease	5	56%
Scabies	2	22%
Varicella (Chickenpox)	1	11%
Impetigo	1	11%

Table 34. Outbreaks Classified as Other by Etiology, West Virginia, 2022

Clinical Syndrome/Etiologic Agent	Number of Outbreaks (n=2)	Percent
Conjunctivitis	1	50%
Yellow Fever	1	50%

**Proportion of Outbreaks with Laboratory Testing:**

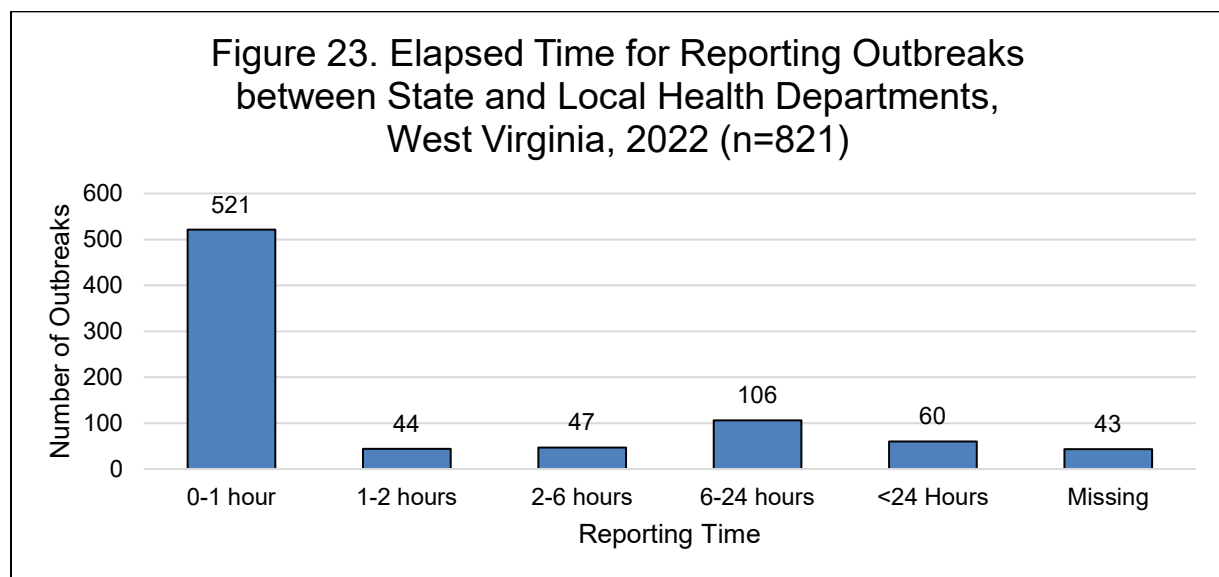
Laboratory testing is crucial in outbreak management. Timely collection of specimens facilitates diagnosis and institution of appropriate control measures. Laboratory confirmation of outbreaks is one of the surveillance indicators and is considered a performance measure for LHD. As shown in Figure 22, the percentage of outbreaks with laboratory testing varied by region from 93% to 97%. Of the 821 confirmed outbreaks, 778 (95%) had laboratory testing.



## **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, LHD are required to report suspected outbreaks or clusters to BPH, DIDE within 60 minutes.

In 2022, the date and time of report to the LHD and BPH were collected for 778 (95%) of the 821 confirmed outbreaks. The range of time between the time the outbreak was reported to the LHD and the time the outbreak was reported to BPH was 0 to 16,479 minutes with a median 30 minutes. Of the 821 confirmed outbreaks, same-day notification occurred for 718 (87%) outbreaks and 521 (63%) were within 60 minutes (Figure 23).



## **ICAR:**

The basic elements of an infection prevention program are designed to prevent the spread of infection in healthcare 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 healthcare 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
- Based upon data analysis

Table 35. ICAR Consultations by Facility Type, West Virginia, 2020

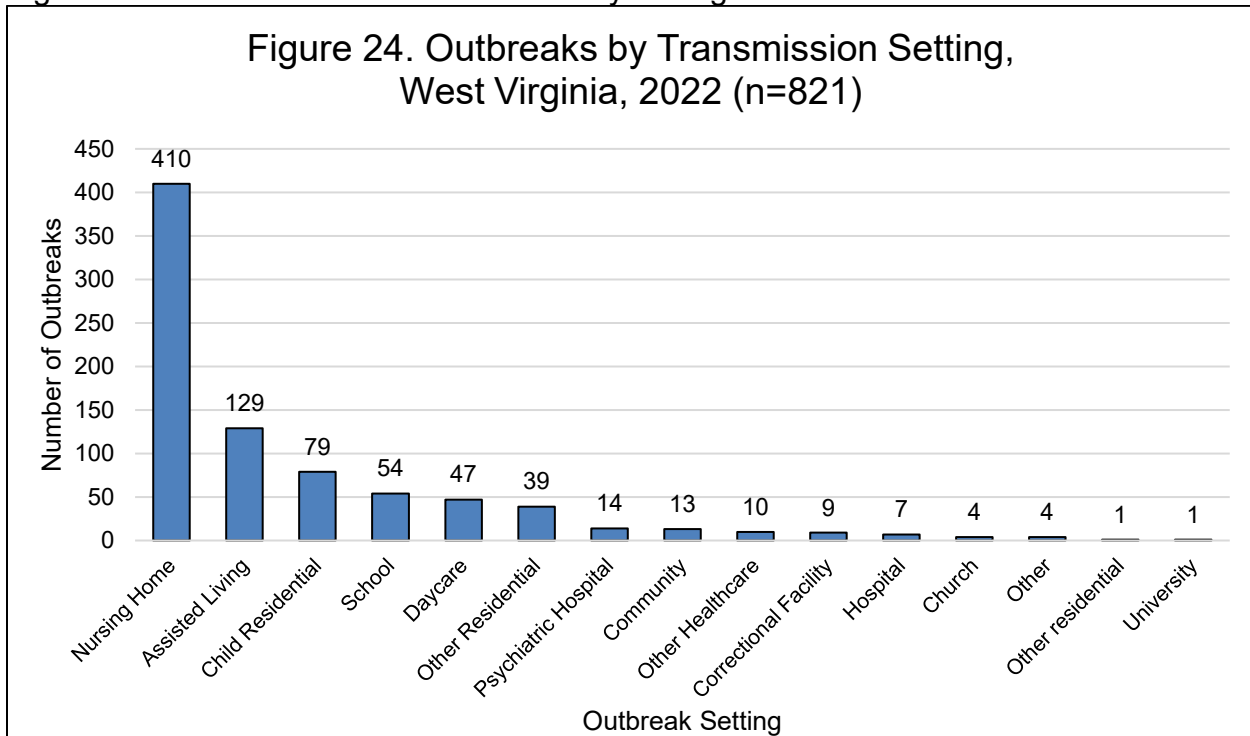
Facility type	Preventive	Response	Total
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Assisted Living	59	30	89
Dialysis Center	23	0	23
Rehabilitation Facility	0	4	4
Psychiatric Facility	0	4	4
Acute Care Hospital	0	2	2
Long Term Acute Care Hospital	0	0	0
Outpatient	0	0	0
Other	0	0	0

**Outbreaks by Transmission Setting:**

The majority of outbreaks are reported from long-term care facilities, specifically nursing homes (63%). Due to a high incidence of comorbidities and frequent healthcare visits across the continuum of healthcare settings, this population is at higher risk of poor outcomes during outbreaks.

As a result of this increased risk, BPH DIDE prioritizes infection control assessments in these facilities to identify gaps in infection control practices and assist with mitigation of gaps identified.

Figure 24 shows all confirmed outbreaks by setting.



## **Findings and 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. Reporting time varied from year to year with a range of 63%-76% being reported within one hour and 87%-93% 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.
3. As a requirement for threat preparedness funding, 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://oeeps.wv.gov/toolkits/Pages/toolkits\\_reports.aspx](https://oeeps.wv.gov/toolkits/Pages/toolkits_reports.aspx)
4. 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, identify areas for improvement to prevent similar outbreaks in the future, and can be used to institute change within the reporting facility.
5. 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 at least 90% of reported respiratory disease outbreaks and 100% of reported foodborne 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.
6. With a high number of staffing changes during the pandemic, LHD should make every effort to attend all offered outbreak trainings to ensure staff are up to date on recommendations and prepared to respond when an outbreak is identified.
7. ICAR visits provide an opportunity to build and/or enhance partnerships with facilities to work collaboratively to improve infection control and prevention practices. By strengthening infection control practices, the risks of an outbreak occurring are decreased and transmission within a facility will be limited. LHD should strive to attend these meetings to facilitate communication with these facilities, particularly those who have had previous issues with reporting or maintaining communication during an outbreak.

### **Findings and Recommendations for RE:**

1. RE should continue to support LHD in outbreak investigation.
2. Maintaining communication during an outbreak is essential to evaluate the effectiveness of control measures and recommendations. RE should work with LHD to provide updates on open outbreaks to DIDE on a regular basis.
3. RE should provide education to new LHD staff on outbreak investigation.
4. Infection Control Assessments provide a great opportunity to establish or improve relationships with facilities in your county. RE should attend these visits, when possible, to establish relationships and provide education, particularly those who have had previous issues with reporting or maintaining communication during an outbreak.

### **DIDE's Objectives:**

The following are ongoing and new objectives for 2023 and beyond:

1. Resume data feedback on outbreaks to LHD and other stakeholders on a regular basis.
2. Work closely with the regional epidemiologists to assist underreporting regions and counties to identify their training needs and provide training as necessary.
3. Statewide training on outbreak investigation will occur on at least an annual basis.
4. Continue to participate in electronic reporting of all enteric outbreaks in the National Outbreak Reporting System (NORS).
5. Update all outbreak toolkits and protocols and develop new resources identified as needed to assist with outbreak investigation.
6. Continue to perform Infection Control Assessment site visits in response to outbreaks, infection control breaches, and as needed.