

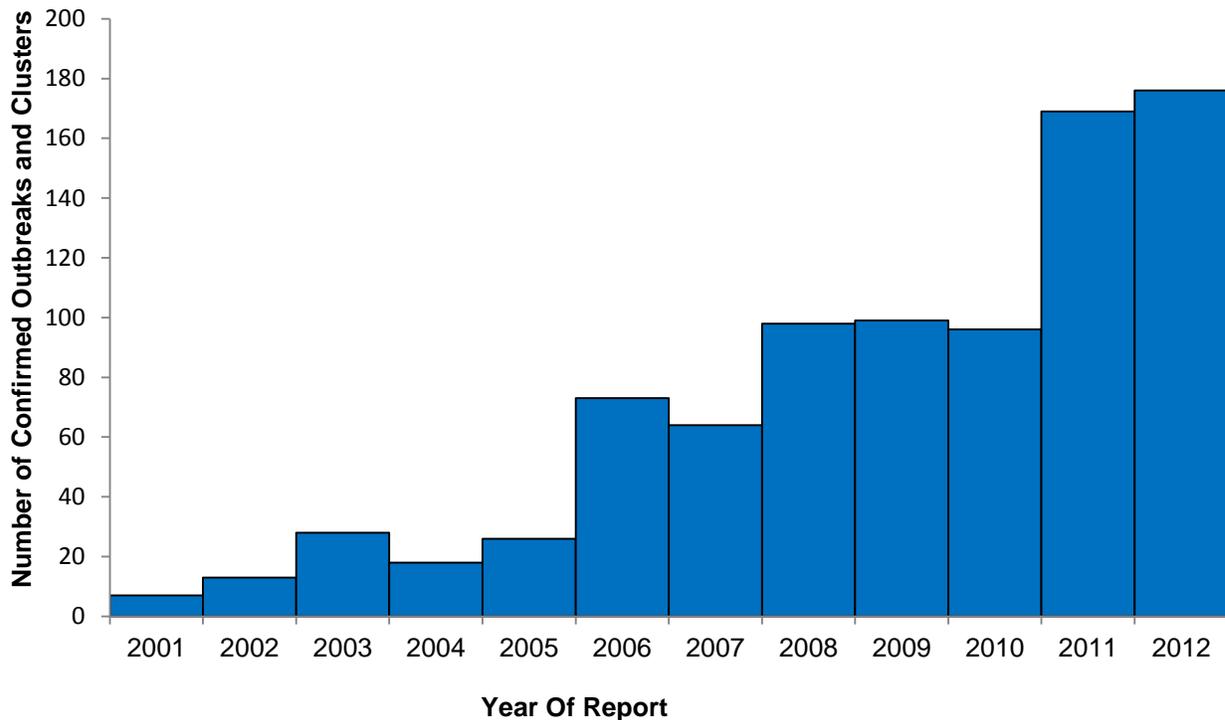
2012 Final Outbreak Report State of West Virginia

Introduction:

In 2012, a total of 203 outbreaks were identified and reported to local health departments (LHDs). Of these reports, 176 (87%) were confirmed as outbreaks or clusters of disease (Appendix A). Local health departments (LHDs) investigate and report outbreaks with assistance from their regional epidemiologist and the Bureau for Public Health (BPH), Division of Infectious Disease Epidemiology (DIDE). Results of these investigations were compiled by the Bureau for Public Health and summarized in this report.

The total number of outbreaks reported in West Virginia continued to rise during 2012. In 2001, 7 confirmed outbreaks were reported. In 2012, 176 confirmed outbreaks were reported, representing a 25-fold increase (Figure 1).

**Figure 1. Confirmed Outbreaks or Clusters,
West Virginia, 2001 - 2012 (n=867)**



Methods

Data on outbreaks was compiled in Microsoft Excel 2010. Data collected includes information on outbreak type and setting, reporting county and region, time of reporting to LHD, and BPH, clinical diagnosis, laboratory information and specific pathogens, mode of transmission, completion of final report and lead investigator. Data was analyzed in Epi Info (TM) 3.5.1

Results:

Jurisdiction:

In 2012, 170 (96.6%) confirmed outbreaks were limited to West Virginia residents, and 7(4.1%) outbreaks involved residents of other states.

Type of outbreaks:

The most common type of outbreaks involved enteric illness, followed by outbreaks of respiratory illness, and rash. Multidrug-resistant organisms (MDROs) outbreaks represented only 5 % of total confirmed outbreaks (Table 1). *Clostridium difficile* outbreaks are counted with enteric outbreaks.

Table 1. Confirmed Outbreaks by Type, West Virginia, 2012 (n=176)

Type of Outbreak	Number of outbreak	Percent
Enteric	75	42.6
Respiratory	55	31.8
Rash	30	17
MDROs	9	5.1
Other	6	3.4
Total	176	100

Outbreaks by Reporting Counties / Regions:

In 2012 35 (63%) counties reported outbreaks (Table 2). Six outbreaks were multi-county outbreaks (Table 3). The highest number of outbreaks (26) was reported from Kanawha County followed by Mercer and Wood Counties with 15 outbreaks each (Figure 2). Individual outbreaks will be reported by surveillance regions rather than by reporting counties to maintain confidentiality of the reporting entity.

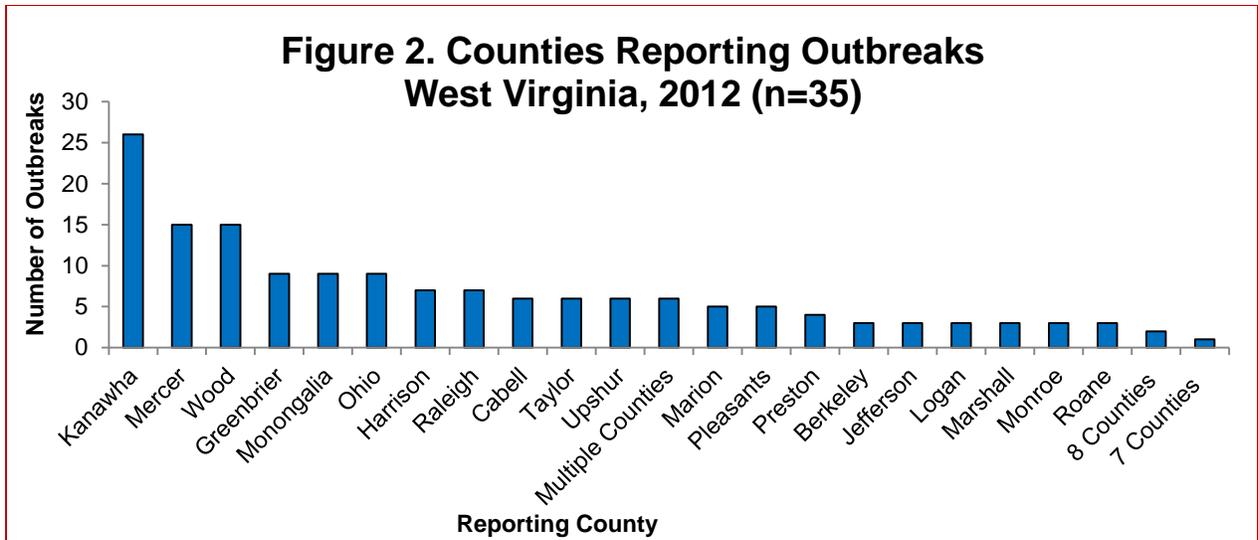


Table 2. Confirmed Outbreaks by Reporting County

Counties Reported outbreaks	Number of Outbreaks
Berkeley	3
Cabell	6
Calhoun	2
Grant	1
Greenbrier	9
Hancock	2
Hardy	1
Harrison	7
Jefferson	3
Kanawha	27
Logan	3
Marion	5
Marshall	3
Mason	2
Mercer	15
Monongalia	9
Monroe	3
Morgan	2
Multiple Counties*	6
Nicholas	1
Ohio	9
Pleasants	5
Pocahontas	1
Preston	4

Putnam	1
Raleigh	7
Randolph	1
Roane	3
Summers	2
Taylor	6
Tyler	2
Upshur	6
Wetzel	2
Wirt	1
Wood	15
Wyoming	2
Total	176

*See Table 3 for details

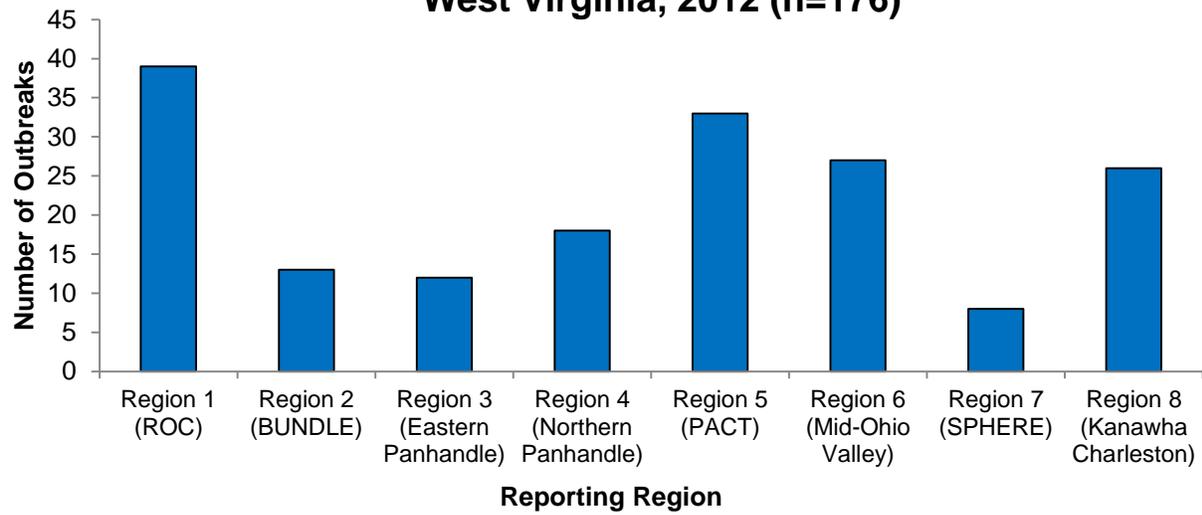
Table 3. Multi-County Outbreaks (n=5)

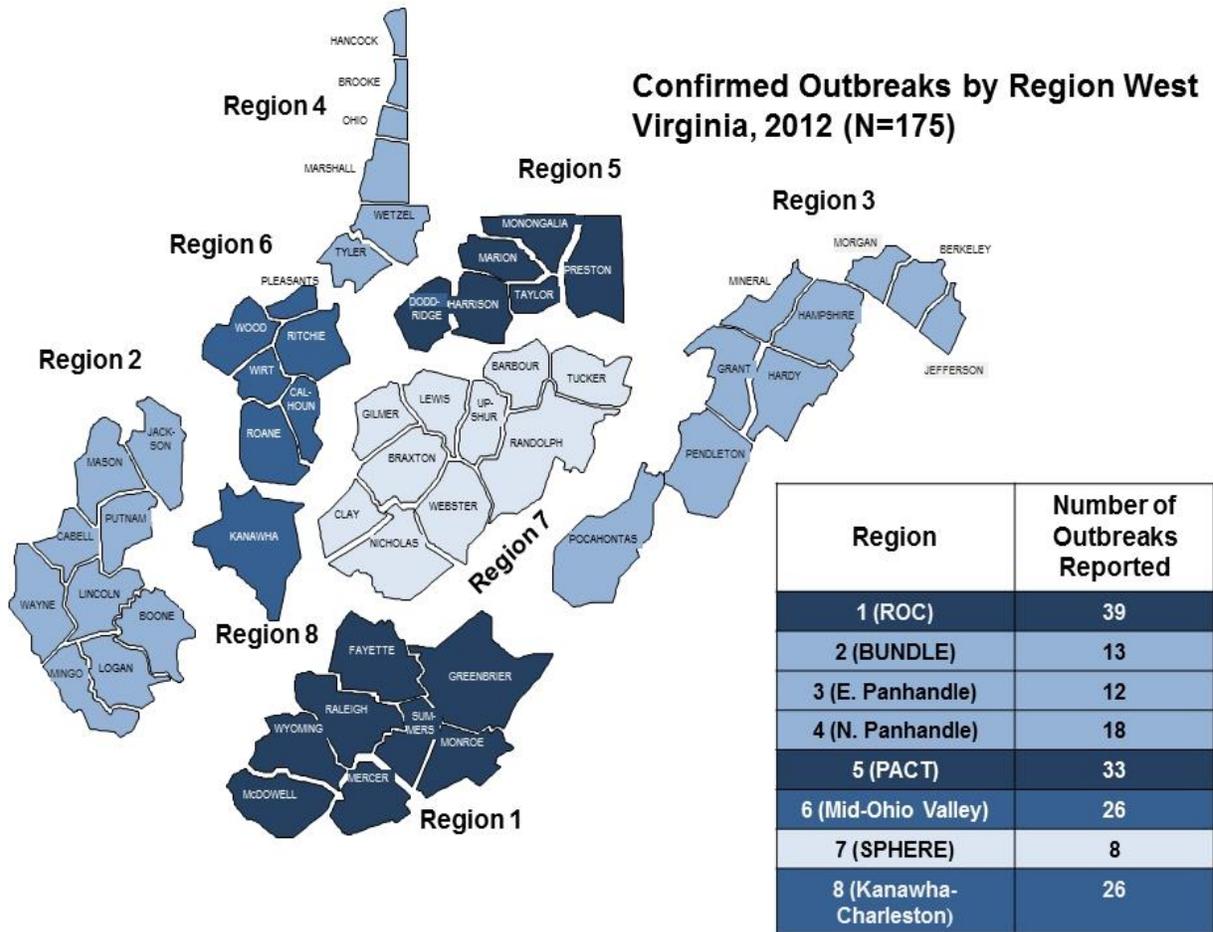
Lead County	Other Counties with Cases
Jefferson	Berkley
Harrison	Lewis
Harrison	Tucker
Mercer	Summers, Roane, Taylor, Fayette, Raleigh, Mingo, Upshur, Hancock, Marshall and Hampshire.
Jackson	Wood, Wayne, Harrison, Pleasants, Fayette, Wetzel, Gilmer, Mingo, Harrison, and Roane
Wood	Mid-Ohio Valley counties and other states

All surveillance regions in the state reported outbreaks in 2012 (Figure 3) See the map in page 5. The following are the different surveillance regions and their counties:

- **Region 1 (ROC)** includes the following counties: Fayette, McDowell, Mercer, Monroe, Raleigh, Summers, and Wyoming.
- **Region 2 (BUNDLE)** includes the following counties: Boone, Cabell, Jackson, Lincoln, Logan, Mason, Mingo, Putnam, and Wayne.
- **Region 3 (Eastern Panhandle)** includes the following Counties: Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral, Morgan, Pendleton, and Pocahontas.
- **Region 4 (Northern Panhandle)** includes the following counties: Brooke, Hancock, Marshall, Ohio, Tyler, and Wetzel.
- **Region 5 (PACT)** includes the following counties: Doddridge, Harrison, Marion, Monongalia, Preston, and Taylor.
- **Region 6 (Mid-Ohio Valley)** includes the following counties: Calhoun, Pleasants, Ritchie, Roane, Wirt, and Wood.
- **Region 7 (SPHERE)** includes the following counties: Barbour, Braxton, Clay, Gilmer, Lewis, Nicholas, Randolph, Tucker, Upshur, and Webster.
- **Region 8 (Kanawha-Charleston)** includes only Kanawha county.

Figure 3. Confirmed Outbreaks by Reporting Region, West Virginia, 2012 (n=176)





Outbreak Leadership

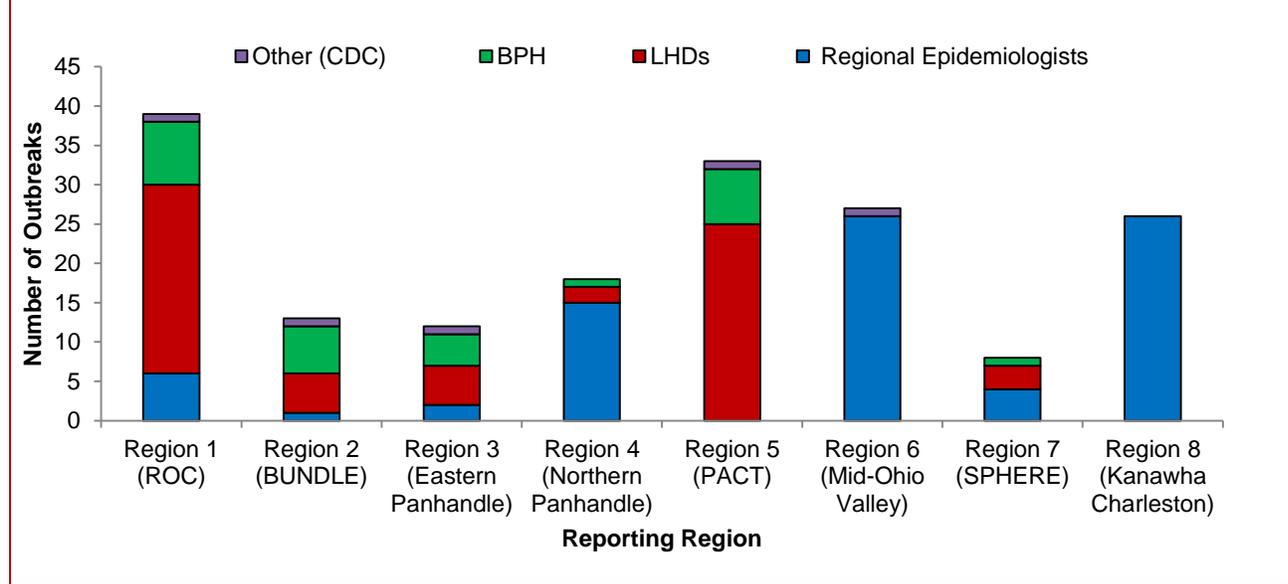
As a requirement to receive threat preparedness fund, the State and LHDs are required to verify outbreak investigation leadership, complete a final outbreak report that meets the Centers for Disease Control and Prevention (CDC) guidelines and share this report with pertinent partners. In 2012, BPH began collecting information on whether outbreak investigation was led by local health departments, regional epidemiologists, BPH or CDC/other states. Regional epidemiologists led the investigation in 80 (45.5%) outbreaks followed by LHDs leading 64 (36.4%) and BPH leading 27 (15.3%) outbreaks. CDC led the investigation in five multi-state outbreaks (Table 4)

Table 4. Confirmed Outbreaks by Primary Leadership, West Virginia, 2012, (n=176)

Primary Leadership	Number of Outbreaks	Percent
Regional Epidemiologists	80	45.5
Local Health Departments	64	36.4
BPH	27	15.3
Others (CDC)	5	2.8
Total	176	100

Outbreak investigation primary leadership varies among different surveillance regions. In six of the eight regions, primary leadership is collaboratively assigned between regional epidemiologists and the LHDs. In the remaining two regions, outbreak investigation is primarily led by the regional epidemiologist due to the structure of the region. One region has only one county and the other is a regional health department that includes 6 counties.

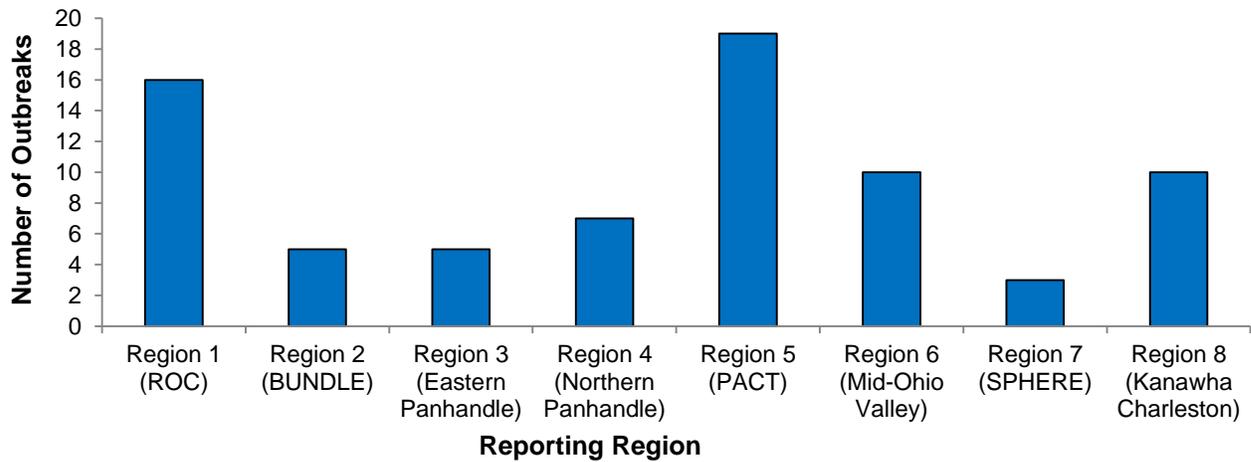
Figure 4. Outbreak Investigation Leadership By Region, West Virginia, 2012, (n=176)



Enteric Disease Outbreaks, West Virginia 2012 (n=75)

Outbreaks of enteric illness were the most common type of disease outbreak in 2012, accounting for 42.6% of all outbreaks. A total of 75 enteric disease outbreaks were reported by 25 (45%) counties. All 8 surveillance regions reported enteric disease outbreaks (Figure 5). Four enteric illness outbreaks were reported in West Virginia as part of a multi-state outbreak. CDC and other states were the lead investigators for the multi-state outbreaks.

Figure 5. Confirmed Enteric Disease Outbreaks by Region, West Virginia, 2012 (n=75)



Fifty seven (76%) enteric disease outbreaks were reported from healthcare facilities including 54 from LTCFs and 3 from hospitals (Table 5).

Table 5. Enteric Disease Outbreaks by Transmission Setting, West Virginia, 2012 (n=75)

Transmission Setting	Number of Outbreaks	Percent
LTCFs	54	72
Community	5	6.7
Restaurant	4	5.3
School	4	5.3
Hospital	3	4
Church Gathering	2	2.7
Family Gathering	2	2.7
Correctional Facility	1	1.3
Total	75	100

Outbreaks of acute gastroenteritis were the most common type of enteric disease outbreaks, accounting for 42 (56%) outbreaks, followed by norovirus gastroenteritis outbreaks accounting for 25 (33.8%) outbreaks (Table 6). *Acute gastroenteritis outbreaks were defined as outbreaks of illness with short duration (2-3 or fewer days) characterized by acute onset of vomiting and /or diarrhea and no laboratory confirmation.*

All norovirus outbreaks were confirmed by polymerase chain reaction (PCR) testing. Norovirus genotype II accounted for the majority of norovirus outbreaks (21); 1 norovirus outbreak was caused by norovirus genotype I. Three norovirus outbreaks

were not subtyped. One enteric disease outbreak was caused by norovirus gastroenteritis and *Clostridium difficile* infection (CDI) in a LTCF. Another outbreak of CDI was reported from a LTCF. There were only two outbreaks of CDI reported in 2012, which may underestimate the incidence of CDI outbreaks in healthcare facilities, particularly LTCFs.

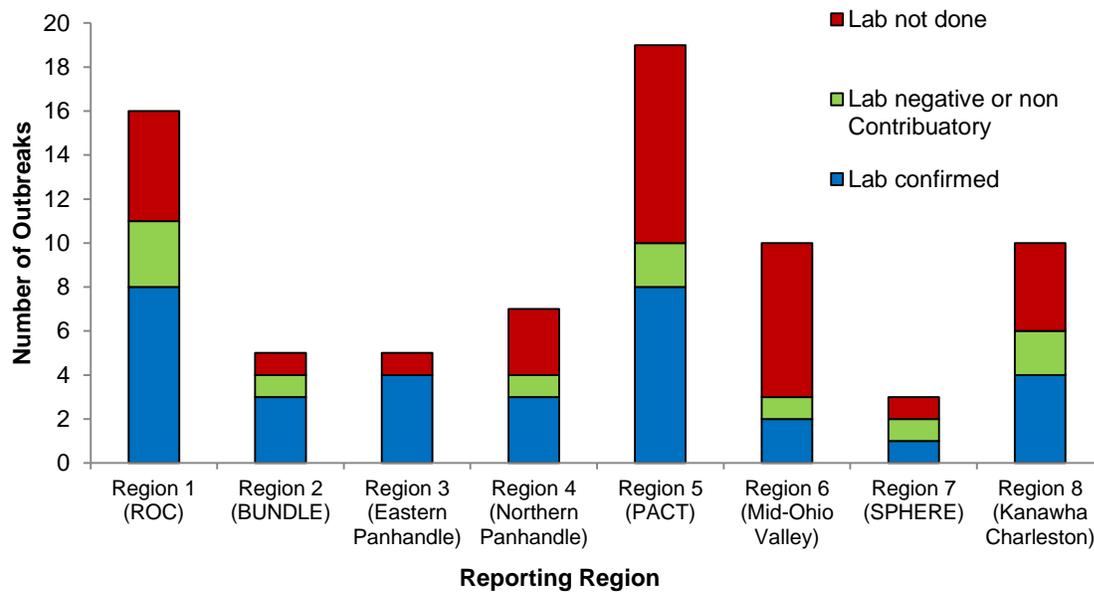
Table 6. Outbreaks of Enteric Disease by Clinical Syndrome / Etiologic Agent, West Virginia, 2012 (n=75)

Clinical Syndrome/Etiologic Agent	Number of outbreak	Percent
Acute Gastroenteritis (No lab confirmation)	42	56
Norovirus Gastroenteritis	25	33.3
Salmonellosis	3	4
<i>Campylobacter</i> Gastroenteritis	2	2.7
<i>Clostridium difficile</i> Infection (CDI)	1	1.3
Norovirus Gastroenteritis / CDI	1	1.3
Shiga toxin-producing <i>Escherichia coli</i> (STEC)	1	1.3
Total	75	100

Among the 42 outbreaks characterized as acute gastroenteritis, laboratory tests were negative or noncontributory in 11 and not done in 31 outbreaks. Figure 6 depicts enteric outbreaks reported from each surveillance region by laboratory testing.

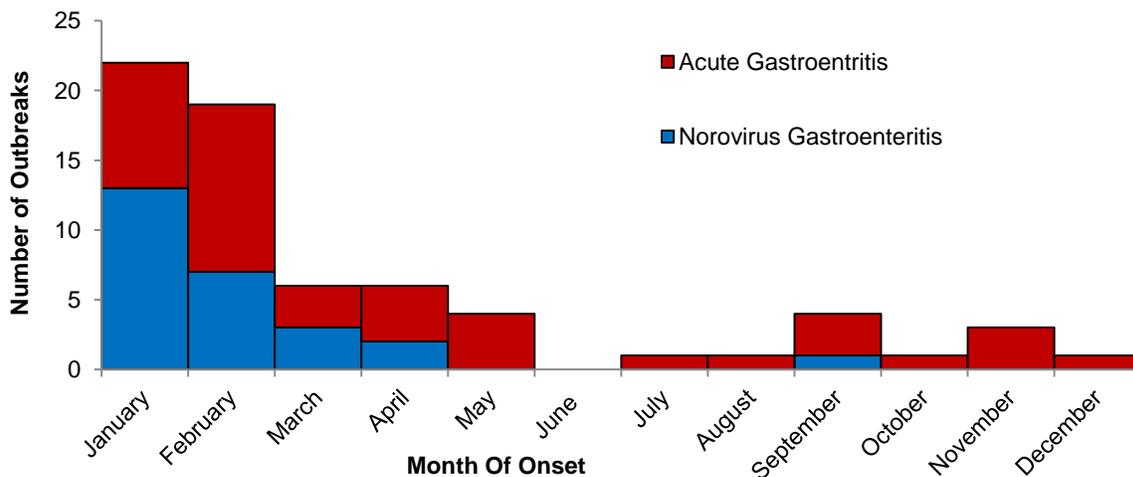
The majority of enteric disease outbreaks 60 (81%) were due to person to person transmission.

Figure 6. Enteric Disease Outbreaks by Region /Laboratory Testing, West Virginia, 2012 (n=75)



Outbreaks of acute gastroenteritis and norovirus exhibited similar seasonality. Outbreaks of acute gastroenteritis followed a pattern of transmission similar to norovirus gastroenteritis outbreaks suggesting that these outbreaks may have been caused by norovirus (Figure 7).

Figure 7. Outbreaks of Acute and Norovirus Gastroenteritis by Month of Report, West Virginia, 2012 (n=68)



There were 3 enteric outbreaks caused by *Salmonella* species. The first outbreak was reported in April 2012 as a part of multistate outbreak of salmonellosis due to close contact with live poultry (chicks and ducks). Three *Salmonella* species were identified in this outbreak including *Salmonella* serotype Infantis, Newport and Montevideo. Trace back investigation by CDC linked *Salmonella* serotype Infantis and Newport to a hatchery in the state of Ohio and *Salmonella* serotype Montevideo to a hatchery in the state of Indiana. West Virginia had a total 12 cases; 10 were *Salmonella newport*, 1 was *Salmonella infantis* and 1 was *Salmonella montevideo*.

The second outbreak was reported in July, 2012 when 4 West Virginia residents were diagnosed with salmonellosis as a part of multi-state outbreak of *Salmonella* serotype Enteritidis. The outbreak affected 46 individuals from 9 states. There were twelve hospitalizations and no deaths associated with this outbreak. CDC led collaborative investigation efforts at local, state, federal public health and regulatory agencies that linked the outbreak to ground beef, produced by Cargill Meat Solutions at a single production facility. On July 22, 2012, Cargill Meat Solutions recalled 29,339 pounds of fresh ground beef products.

The third outbreak was reported in September, 2012 when three West Virginia residents were diagnosed with *Salmonella* serotype Pomona. A total of 347 individuals from 37 states and the District of Columbia became infected with the outbreak strains of *Salmonella* serotype Sandiego, Newport, Pomona, Poona, and Typhimurium. The CDC led investigation linked this outbreak to contact with small turtles and their habitats. Twenty-eight percent of ill persons have been hospitalized, and no deaths have been reported. Seventy percent of ill persons are children 10 years of age or younger, and 33% of ill persons are children 1 year of age or younger.

There was a multi-county outbreak of Shiga toxin-producing *E. coli* (STEC O157:H7) that affected 2 individuals from West Virginia. One individual was a confirmed and the other was a probable case. Investigation revealed that the two individuals attended a dinner at a family gathering. No hospitalizations or deaths associated with this outbreak.

Respiratory Disease Outbreaks, West Virginia, 2012 (n=56):

Outbreaks of respiratory illness were the second most common type of disease outbreak in 2012, accounting for 56 (31.8%) confirmed outbreaks (Table 1). Respiratory illness outbreaks were reported by 23 (42%) counties from 8 surveillance regions (Figure 8).

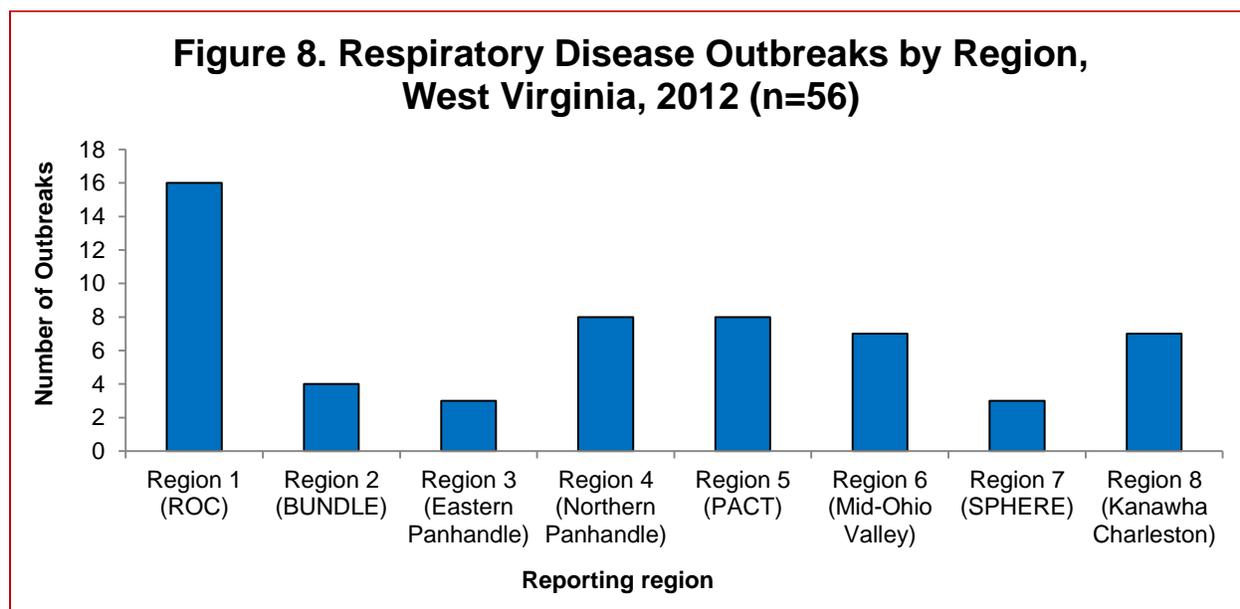


Table 7. Respiratory Disease Outbreaks by Clinical Syndrome, West Virginia, 2012 (n=56)

Clinical Syndrome	Number of Outbreaks	Percent
Influenza	26	46.4
Acute Respiratory Syndrome	19	33.9
Pertussis (Whooping cough)	6	10.7
<i>Streptococcus pharyngitis</i>	2	3.6
Influenza-like illness	1	1.8
Influenza / <i>Streptococcus Pharyngitis</i>	1	1.8
Pneumonia	1	1.8
Total	56	100

Influenza outbreaks accounted for the majority of respiratory disease outbreaks followed by acute respiratory syndrome, and pertussis (Table 7). *Acute respiratory illness is defined as “acute onset of symptoms of upper and/or lower respiratory illness in excess of what is expected in a specific time and location with known or unknown etiologic agents”.* *Influenza-like illness (ILI) is defined as a fever of a 100 degrees Fahrenheit or higher, plus cough, and/or sore throat in the absence of a known cause.*

Of respiratory outbreaks 41 were laboratory confirmed, 7 had laboratory testing that was negative or noncontributory and in 8 outbreaks laboratory testing was not done. Figure 9 depicts respiratory outbreaks by laboratory confirmation from each surveillance region. Respiratory outbreaks are listed by etiological agents in Table 8.

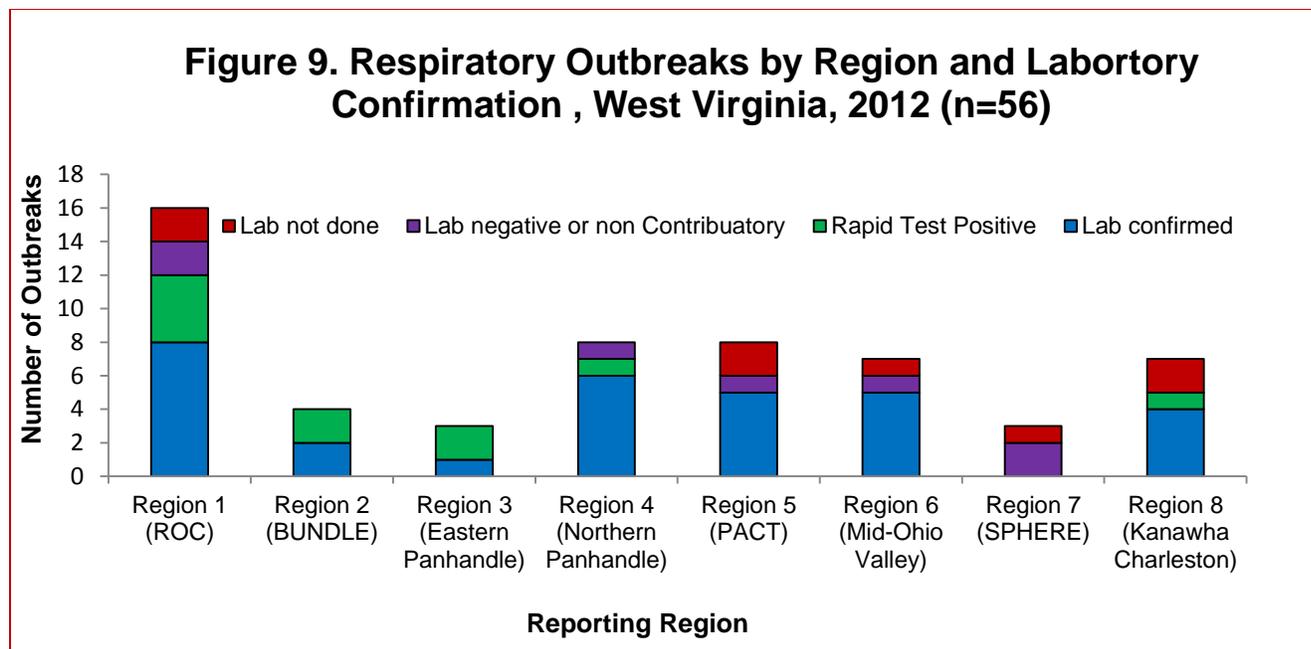


Table 8. Respiratory Disease Outbreaks by Etiologic Agent, West Virginia, 2012 (n=56)

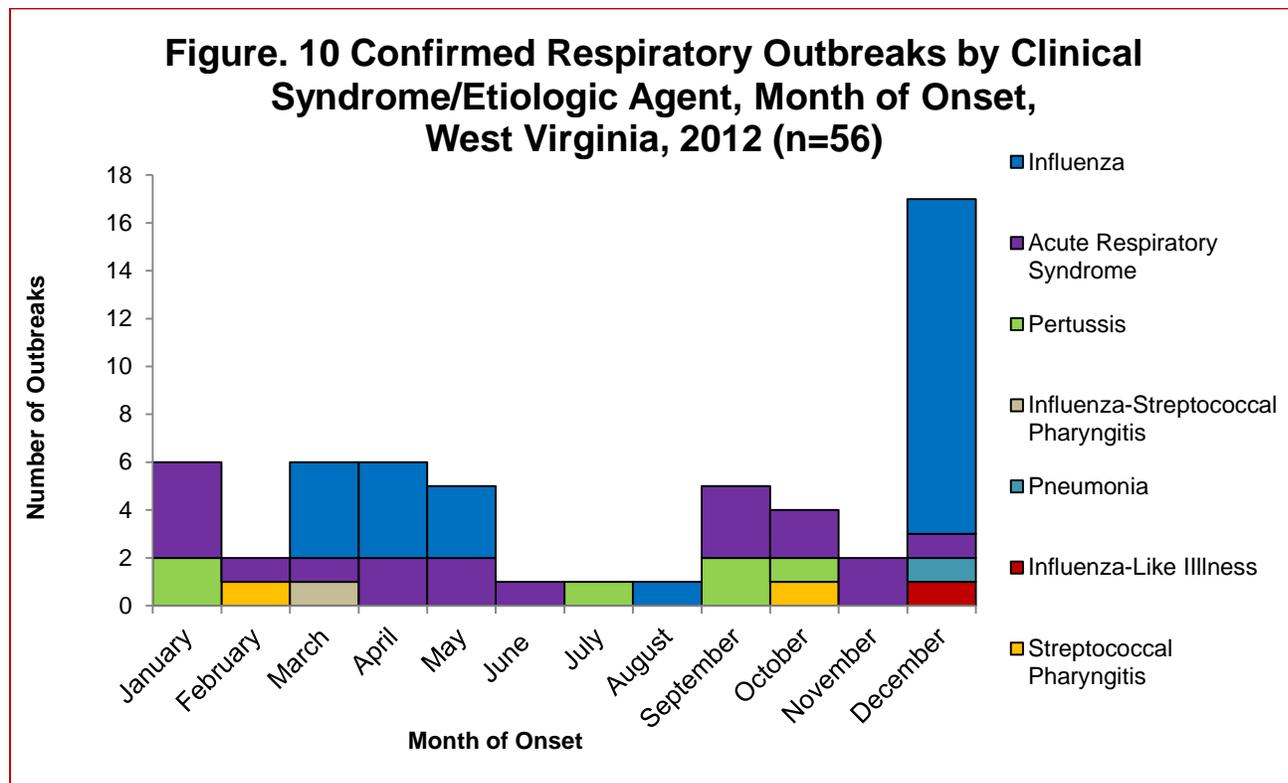
Etiologic Agent	Number of Outbreaks	Percent
Influenza A H3	17	30.4
Undetermined	15	26.8
<i>Bordetella pertussis</i>	6	10.7
Influenza A (no subtyping)	4	7.1
Rhinovirus	4	7.1
Human Metapneumovirus	2	3.6
Influenza A & B	2	3.6
Influenza B	2	3.6
Group A streptococcus (GAS)	2	3.6
Influenza	1	1.8
Influenza (H3N2)v	1	1.8
Total	56	100

The majority of respiratory disease outbreaks were reported in LTCFs followed by schools and communities (Table 9)

Table 9. Respiratory Disease Outbreaks by Transmission Settings, West Virginia, 2012 (n=56)

Transmission Setting	Number of Outbreaks	Percent
Nursing Homes	37	66.1
Schools	8	14.3
Communities	5	8.9
Assisted Living Facilities	2	3.6
Daycares	2	3.6
Animal Fair	1	1.8
Outpatient Clinic	1	1.8
Total	56	100

Figure 10 illustrates respiratory disease outbreaks by clinical syndrome/etiologic agent and month of onset.



Influenza Outbreaks

In 2012, there were 27 influenza outbreaks. All influenza outbreaks were laboratory confirmed. Twenty (74%) influenza outbreaks were confirmed by PCR and 7 (27%) were confirmed by rapid influenza diagnostic test (RIDT). The majority of influenza outbreaks were caused by seasonal influenza A H3 (Table 10). The 2011-2012 influenza season was relatively quiet and influenza outbreaks were reported late in the season from March through May, 2012 (Figure 10). However, in 2012-2013 season, influenza was wide spread in West Virginia and nationally. Fourteen influenza outbreaks were reported in December, 2012 compared to one influenza outbreak reported in December 2011.

The majority of influenza outbreaks were reported from LTCFs including 17 from nursing homes and 2 from assisted living facilities (Table 11). Influenza outbreaks are associated with increased morbidity and mortality among the elderly. This underscores the importance of LHDs assisting LTCFs in preparing for influenza season.

Table 10. Influenza Outbreaks by Etiologic Agent, West Virginia, 2012 (n=27)

Etiologic Agent	Number of Outbreaks	Percent
Influenza A H3	17	63
Influenza A	4	14.8
Influenza A & B	2	7.4
Influenza B	2	7.4
Influenza	1	3.7
Influenza (H3N2)v	1	3.7
Total	27	100

Six influenza outbreaks were reported from schools and one from a daycare. In one school outbreak both influenza A H3 and group A *streptococcus* (GAS) were identified among ill children. Additionally, one ILI outbreak was reported from a school. In this outbreak no laboratory test was done but most ill students met the ILI case definition.

Table 11. Influenza Outbreaks by Transmission Setting, West Virginia, 2012 (n=27)

Transmission Setting	Number of Outbreaks	Percent
Nursing Home	17	63
School	6	22.2
Assisted Living Facilities	2	7.4
Animal Fair	1	3.7
Daycare	1	3.7
Total	27	100

In August 2012, there was one outbreak of influenza A (H3N2)v reported in WV as a part of multi-state outbreak. CDC led the investigation of this outbreak. In West Virginia,

there were three confirmed cases. There were no associated hospitalizations or deaths. Investigation revealed that the three cases acquired the infection through direct or indirect contact with pigs in an out-of-state animal fair. There was no person-to-person transmission of influenza virus in this outbreak.

Pertussis Outbreaks

In 2012, there were 6 outbreaks of pertussis (whooping cough) reported from four surveillance regions. All pertussis outbreaks were laboratory confirmed by either culture or PCR. Five outbreaks were reported among communities and the remaining outbreak was reported from an outpatient clinic. There were no pertussis-related deaths in WV in 2012. Pertussis is an endemic disease in West Virginia and the U.S. In West Virginia, there were 5 pertussis outbreaks reported in 2010 and two in 2011. The disease displays a cyclical pattern and causes periodic outbreaks every 3 to 5 years. Pertussis outbreaks can be difficult to identify and manage. For the purpose of this report, a pertussis outbreak is defined as two or more cases involving two or more households clustered in time and space where transmission is suspected to have occurred. One or more cases in an outbreak should be confirmed by positive culture and/or PCR results. It is imperative to note that PCR tests to detect *Bordetella pertussis* vary in specificity; therefore, culture remains the gold standard for diagnosis. Vaccination is the best defense against this disease. However, since the vaccine is not 100% effective, pertussis outbreaks can still occur even in highly vaccinated populations.

Streptococcus Pharyngitis Outbreaks

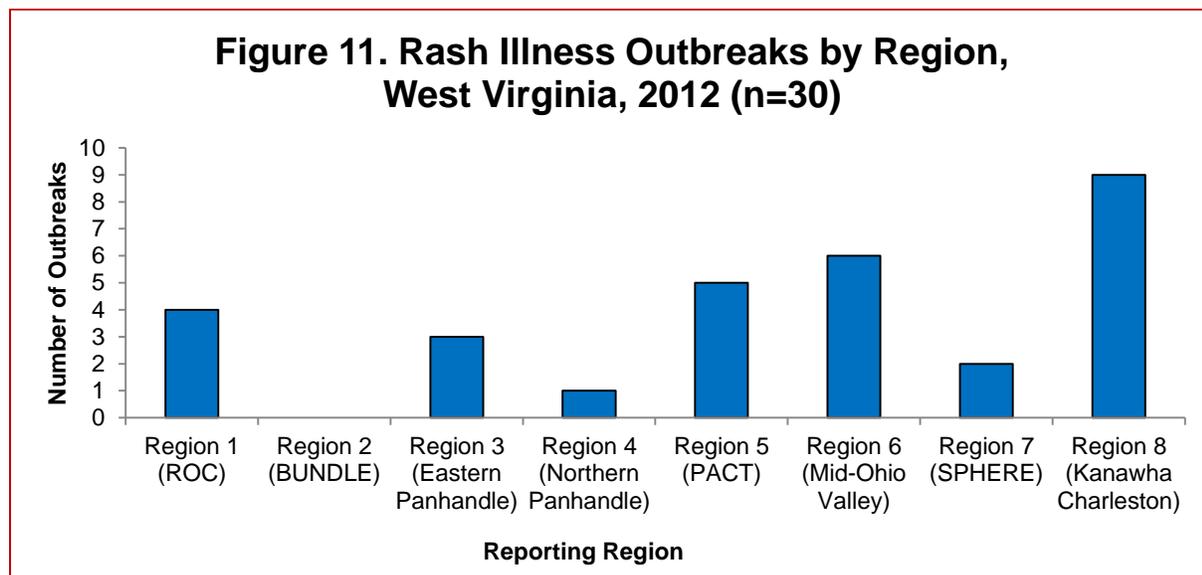
There were 3 outbreaks of *Streptococcus* pharyngitis reported in 2012. Two outbreaks were reported from schools and one from a daycare. One outbreak occurred simultaneously with influenza A H3 outbreak. All three outbreaks were rapid test positive but not culture confirmed. *Streptococcus* pharyngitis is caused by group A *Streptococcus* (GAS) and presents clinically with fever, pharyngitis and sore throat.

Other Respiratory Outbreaks

There were four outbreaks of rhinovirus and 2 outbreaks of human metapneuvirus reported from LTCFs. See details in the healthcare associated outbreaks section. Additionally, there were 15 outbreaks of undetermined etiology. Laboratory testing was negative or noncontributory in 7 and not done in 8 outbreaks. Fourteen outbreaks were reported from LTCFs and the remaining one from a school.

Rash Illness Outbreaks, West Virginia, 2012 (n=30)

Outbreaks of rash illness were the third most common outbreak type in 2012 accounting for 30 (17%) outbreaks and reported by 16 (29%) counties from 7 surveillance regions (Figure 11).



The most common type of rash illness outbreaks reported was Hand Foot and Mouth Disease (10) followed by scabies (8) varicella (chickenpox) (4) and Fifth's disease (3) (Table 12).

Table 12. Outbreaks of Rash Illness by Clinical Syndrome / Etiologic Agent, West Virginia, 2012 (n=30)

Clinical Syndrome	Number of Outbreaks	Percent
Hand Foot and Mouth Disease	10	33.3
Scabies	8	26.7
Varicella	4	13.3
Fifth's Disease	3	10
Folliculitis	1	3.3%
Herpes gladiatorum	1	3.3
Impetigo	1	3.3
CA-MRSA* Skin and Soft Tissue infection.	1	3.3
Multiple Clinical Diagnoses	1	3.3
Total	30	100

* Community-acquired methicillin-resistant *Staphylococcus aureus*

There were 10 outbreaks of Hand Foot and Mouth disease that were reported from daycares. All 10 outbreaks were confirmed by clinical presentation/physician diagnosis. The majority of these outbreaks were reported from one county. This increase in reporting can be attributed to increased awareness among daycare facilities after the local health department and regional epidemiologist provided a county-wide training to daycare facilities' staff on reportable diseases and outbreaks. HFMD is a common viral illness of infants and children and usually causes fever and blister-like eruptions in the mouth and/or a skin rash. There is no vaccine to protect against the viruses that cause HFMD. Prevention strategies include hand washing, avoiding close contact with infected person, and disinfecting dirty surfaces and soiled items such as toys.

Eight outbreaks of scabies were reported in 2012 from 5 surveillance regions. Among scabies outbreaks, 1 was laboratory confirmed, and 7 did not have laboratory testing but were clinically confirmed. Three scabies outbreaks were reported in healthcare facilities, 2 in group homes, 2 in schools and 1 in a correctional facility (Table 13). 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 pimple-like skin rash. Scabies is transmitted from person-to-person by direct, prolonged, skin-to-skin contact.

Table 13. Outbreaks of Scabies by Transmission Setting, West Virginia, 2012 (n=8)

Transmission	Number of outbreaks	Percent
LTCFs	3	37.5
Group Home	2	25
School	2	25
Correctional Facility	1	12.5
Total	8	100

In 2012, there were 4 outbreaks of varicella reported by 4 counties from 3 regions. The four outbreaks were confirmed by clinical presentation/physician diagnosis. Laboratory testing was not done in any of these outbreaks. The number of varicella outbreaks in 2012 continued to decrease from the previous two years. This decrease can be explained by the completion of the varicella project at the end of the 2010-2011 school-year. Active surveillance in public schools ended at that time, and the varicella outbreak definition was returned to the one that was used before the start of the varicella project: 5 epidemiologically linked cases of varicella from any given school, day care or long-term care facility, as opposed to 3 epidemiologically linked cases, which was used to define outbreaks during the varicella project. However, enhanced surveillance in public schools is ongoing. School nurses complete a monthly electronic survey to report the number of varicella cases identified in their schools.

Two outbreaks of skin rashes were reported from sports teams. Both outbreaks were clinically diagnosed by physicians. One was diagnosed as herpes gladiatorum and the other had multiple clinical diagnoses, such as herpes gladiatorum, folliculitis, and impetigo. In both outbreaks, ill players were seen by several physicians. One additional outbreak of rash illness was reported from a school and was diagnosed as impetigo by a clinician. It is very difficult to manage these outbreaks and provide recommendations without laboratory confirmation since the management changes considerably based on the causative organism identified by laboratory testing. LHDs are encouraged to work closely with their school nurses and coaches to get a laboratory confirmation once they suspect a rash illness outbreak in a sports team.

One outbreak of community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) skin infection was reported in a daycare. The outbreak was laboratory confirmed. Investigation revealed person-to-person transmission. CA-MRSA is a common cause of skin and soft tissue infections among healthy individuals in the community without exposure to healthcare settings. Infections may appear as pustules or boils which often are red, swollen, painful, or have pus or other drainage and commonly occur at sites of visible skin trauma, such as cuts and abrasions, and areas of the body covered by hair.

Multidrug-Resistant organism (MDRO) Outbreaks

MDRO outbreaks will be discussed under healthcare-associated outbreaks section.

“Other” Outbreaks

There were 6 (3.4%) confirmed outbreaks in 2012 that were categorized as “other” (Table 14). “Other” outbreaks were reported by 5 (9%) counties from 3 surveillance regions. One outbreak involved multiple counties.

Table 14. Outbreaks Categorized as “Other” by Clinical Syndrome / Etiologic Agent, West Virginia, 2012 (n=6)

Clinical Syndrome/Etiologic Agent	Number of Outbreaks	Percent
Mumps	2	33.3
Acute Conjunctivitis	1	16.7
Invasive Group A streptococcus	1	16.7
Fungal Meningitis and other Infections	1	16.7
<i>Serratia marcescens</i>	1	16.7
Total	6	100

Two outbreaks of mumps were reported from schools. The first one involved one case that was laboratory confirmed by serologic testing. The second outbreak was also reported from a school and involved one patient. The case-patient was clinically diagnosed and met the case definition for a suspect case. Both cases were up-to-date

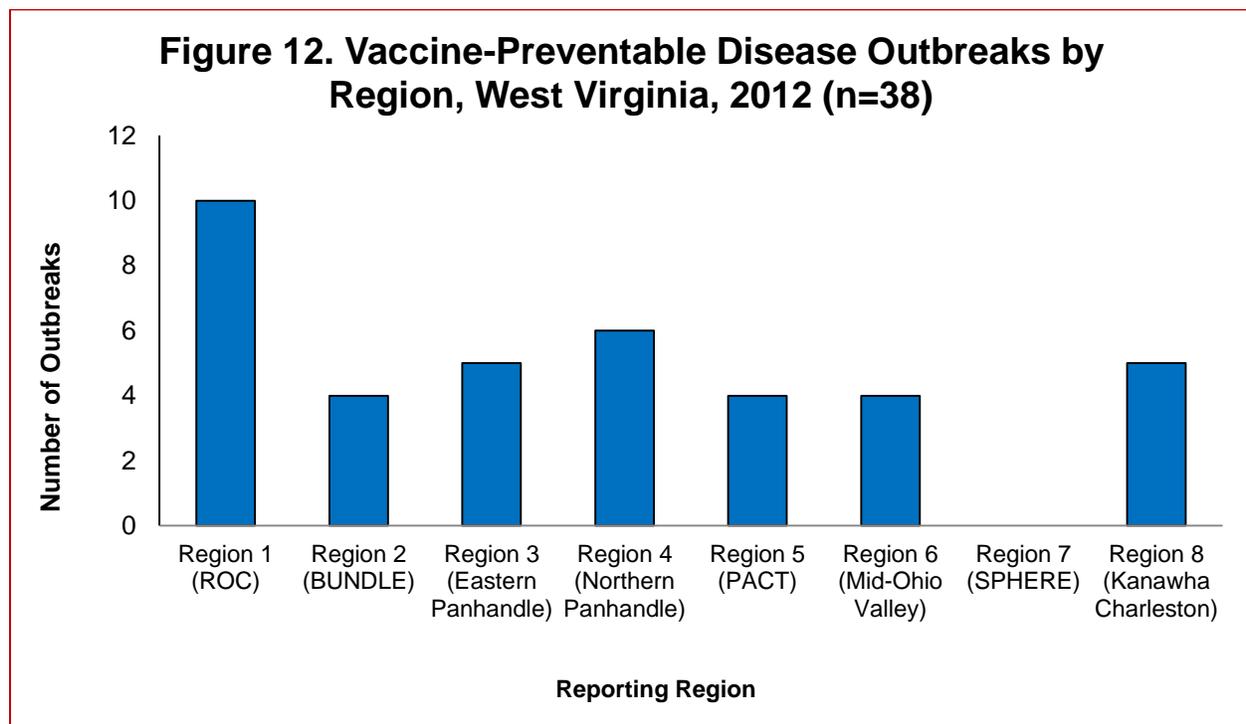
in their immunization status. No additional cases were identified in either outbreak. Outbreak of mumps is defined as two or more cases or one case in a congregate setting, such as schools and daycares. It is imperative to confirm diagnosis of a suspect case of mumps by performing appropriate testing in a timely manner. Appropriate testing includes serum sample, buccal and nasopharyngeal swabs and urine specimens.

One outbreak of acute conjunctivitis was reported from a school. No laboratory testing was done in this outbreak.

Fungal meningitis and *Serratia marcescens* outbreaks are discussed under healthcare-associated outbreaks section.

Vaccine-Preventable Disease Outbreaks (VPDOs)

In 2012, 38 (21.6%) vaccine-preventable disease outbreaks reported from 23 counties (42%) in 7 surveillance regions. (Figure 12)



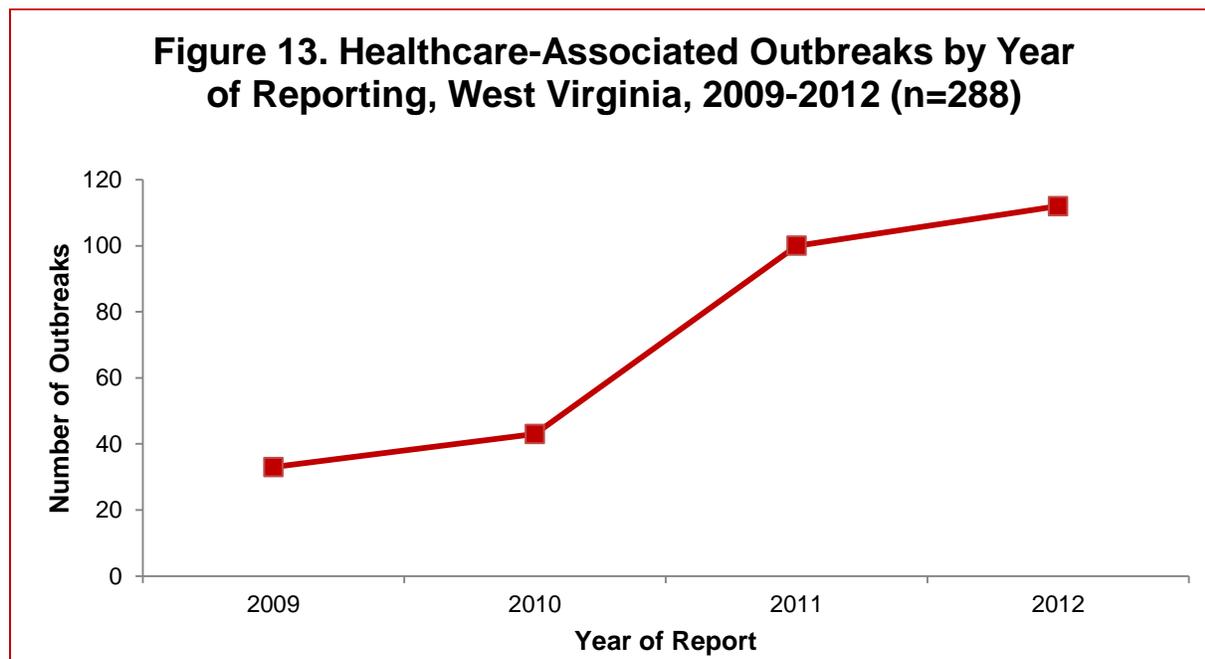
Influenza outbreaks were the most common vaccine-preventable disease outbreaks (26) followed by Pertussis (6), varicella (chickenpox) (4), and mumps (2) (Table 14). Influenza A (H3N2)v is not considered VPD since currently there is no available vaccine against this strain of influenza virus.

Table 15. Vaccine Preventable Disease Outbreaks by Etiologic Agent or Clinical Syndrome, West Virginia, 2012 (n=38)

Clinical Syndrome/Etiologic Agent	Number of Outbreaks	Percent
Influenza	26	68.4
Pertussis	6	15.8
Varicella	4	10.5
Mumps	2	5.3
Total	38	100

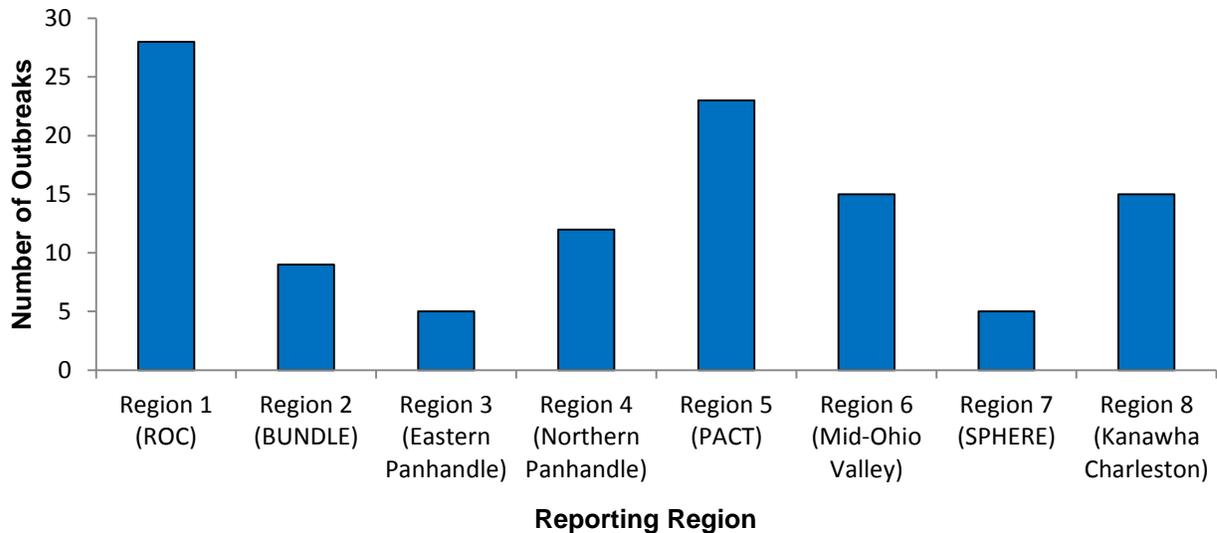
Healthcare-Associated Outbreaks (HAOs):

The number of HAOs reported in West Virginia has increased almost four fold since 2009 (Figure 13). HAOs are defined as “hospital-acquired or healthcare facility-acquired infections among patients or staff clustered temporally and/or geographically and represent an increase in the incidence over expected background rates.”



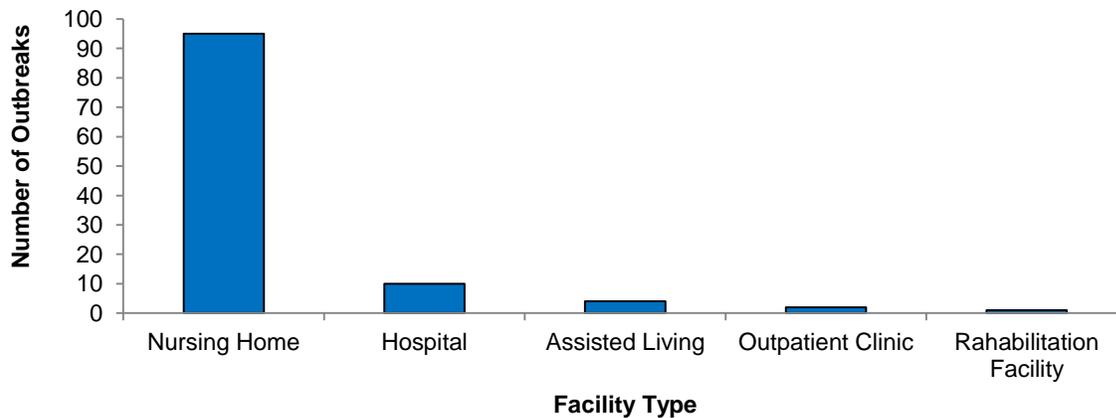
In 2012, 112 healthcare-associated outbreaks were reported from 26 (47%) counties in all surveillance regions (Figure 14). HAOs accounted for 64% of all confirmed outbreaks in West Virginia.

Figure 14. Healthcare-Associated Outbreaks by Region, West Virginia, 2012 (n=112)



The majority of HAOs were reported in nursing homes 95 (85%), followed by hospitals 10 (9%), assisted living facilities 4 (4%), outpatient medical clinics 2 (2%) and a rehabilitation facility 1 (1%) (Figure 15).

Figure 15. Healthcare-Associated Outbreaks By Facility Type, West Virginia, 2011 (n=112)

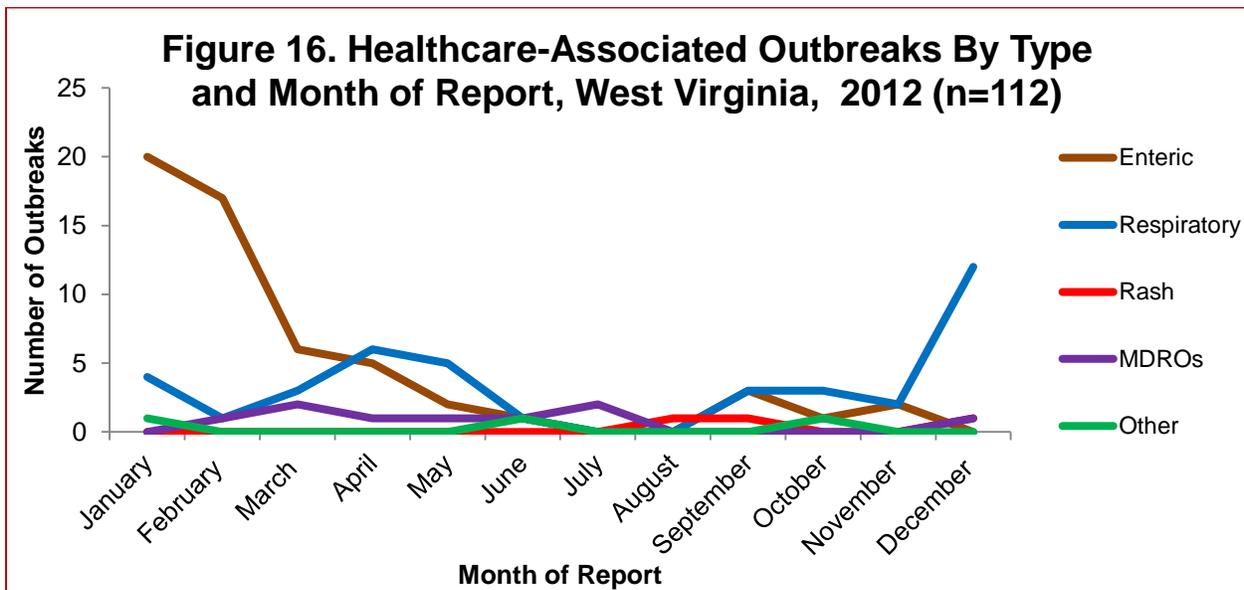


Enteric disease outbreaks accounted for the majority of healthcare-associated outbreaks 57 (51%) followed by respiratory disease outbreaks 40 (36%), and multidrug-resistant organism (MDROs) outbreaks 9 (8%) (Table 16).

Table 16. Healthcare-Associated Outbreaks by Type of Outbreak, West Virginia, 2012 (n=112)

Outbreak Type	Number of Outbreaks	Percent
Enteric	57	50.9
Respiratory	40	35.7
MDROs	9	8.0
Other	3	2.7
Rash	3	2.7
Total	112	100

In 2012, a seasonal trend was observed with HAOs that showed an increase in HAOs during colder months of the year. This may be related to increased circulation of the influenza virus and norovirus during this time of the year (Figure 16).



Healthcare-Associated Enteric Diseases Outbreaks

Enteric disease outbreaks (57) were the most common outbreak type reported in healthcare facilities in 2012. The majority of healthcare-associated enteric disease outbreaks were acute gastroenteritis followed by norovirus gastroenteritis (Table 17). Most enteric disease outbreaks were reported in nursing homes (52) followed by hospitals (3) and assisted living facilities (2). Twenty seven healthcare associated enteric disease outbreaks were laboratory confirmed, 21 did not have laboratory testing done and 9 had negative or non-contributory laboratory testing. Of the laboratory-confirmed

enteric disease outbreaks 25 were caused by norovirus, one by *Clostridium difficile* and one outbreak was caused by both norovirus and *Clostridium difficile*.

Table 17. Healthcare-Associated Enteric Disease Outbreaks by Clinical Syndrome/Etiologic Agent, West Virginia, 2012, (n=57)

Clinical Syndrome/Etiologic Agent	Number of Outbreaks	Percent
Acute Gastroenteritis	30	52.6
Norovirus Gastroenteritis	25	43.9
<i>Clostridium difficile</i> Infection (CDI)	1	1.8
Norovirus Gastroenteritis / CDI	1	1.8
Total	57	100

Healthcare-Associated Respiratory Diseases Outbreaks

Respiratory disease outbreaks (40) were the second most common outbreak type reported in healthcare facilities. The majority of healthcare-associated respiratory outbreaks were acute respiratory illness followed by influenza outbreaks (Table 18). Twenty one outbreaks were laboratory-confirmed by culture/PCR, 5 were confirmed by rapid test, 7 had negative or noncontributory laboratory results and 7 had no laboratory testing done.

There were 19 healthcare-associated influenza outbreaks reported from LTCFs. Influenza A H3 was the most common viral strain and accounted for 13 outbreaks. There were two outbreaks of Influenza B reported from LTCFs, one was confirmed by PCR and the other was confirmed by RIDT. Influenza B usually causes milder illness than Influenza A and primarily affects children.

Four acute respiratory illness outbreaks reported from LTCFs were caused by human rhinovirus. Testing for these outbreaks was performed at OLS using Film Array multiplex PCR technology. In two of these outbreaks the attack rates among residents were 52% and 45% respectively. In both outbreaks clinical presentations ranged from mild upper respiratory illness to severe pneumonia which demonstrates that rhinovirus may cause severe illness among LTCFs residents. The other two outbreaks did not have sufficient data to calculate attack rates.

Two outbreaks of human metapneumovirus (hMPV) were reported from LTCFs. In one outbreak the attack rate was 34% among residents and 22% among staff. Among ill residents, 64% had radiologically-confirmed pneumonia, 28.5% had lower respiratory tract infection and 3.6% had upper respiratory tract infection and 3.6% had only cough. Four (14%) hospitalizations and 4 (14%) deaths were reported among ill residents. Due to the severity of the outbreak CDC was consulted and laboratory confirmation was done at CDC. The second outbreak had an attack rate of 28% among residents. Laboratory confirmation was done at OLS. These two outbreaks demonstrate that

hMPV can cause respiratory outbreaks in LTCFs. hMPV may cause outbreaks of severe respiratory illness among institutionalized elderly. Laboratory confirmation of hMPV is essential to modify infection control measures to control the outbreak.

Table 18. Healthcare-Associated Respiratory Disease Outbreaks by Clinical Syndrome/Etiologic Agent, West Virginia, 2012 (n=40)

Clinical Syndrome/Etiologic Agent	Number of Outbreaks	Percent
Acute Respiratory Syndrome (Undetermined Etiology)	14	35
Influenza A H3	13	32.5
Rhinovirus	4	10.
Influenza A	3	7.5
Human Metapneumovirus	2	5
Influenza B	2	5
<i>Bordetella pertussis</i> (Whooping Cough)	1	2.5
Influenza	1	2.5
Total	40	100

Healthcare-Associated Rash Illness Outbreaks

There were 3 rash illness outbreaks reported from LTCFs. All three outbreaks were scabies. Two scabies outbreaks were confirmed by clinical diagnosis and the remaining one was laboratory confirmed.

Other Healthcare-Associated Outbreaks

Three other HAOs were reported. The first one was an outbreak of invasive group A *streptococcus* diagnosed among 4 patients hospitalized in an acute care facility. Further investigation revealed that there was no epidemiologic link among these patients. Infection with group A *streptococcus* was probably acquired in the community. There was no evidence to suggest that those infections were nosocomial.

The second outbreak was an outbreak of *Serratia marcescens* reported from a specialty care unit in an acute care facility. CDC was consulted in this outbreak. The outbreak involved 7 patients who had variable clinical presentations. *Serratia* isolates from case-patients were sensitive to most antimicrobial agents. The outbreak was controlled after heightening environmental cleaning and modifying some respiratory therapy practices.

The third outbreak was a part of the multi-state outbreak of fungal meningitis and other infections among patients who received contaminated preservative-free steroid injections from New England Compounding Company (NECC). CDC is leading this outbreak investigation that includes patients with fungal meningitis, localized spinal or paraspinal infections, and/or infections associated with injections in a peripheral joint

space, such as a knee, shoulder, or ankle. Currently there are 733 patients from 20 states affected by this outbreak. In West Virginia, only one healthcare facility received the contaminated steroids. Investigation identified 223 patients who received the recalled steroids. Among those exposed patients, 111 received epidural injections, 101 received other injections and 11 received both. As of April 2013, West Virginia has seven cases: two have meningitis and paraspinal/spinal infections and 5 have spinal/paraspinal infections which may include epidural abscess, phlegmon, discitis, vertebral osteomyelitis, or arachnoiditis. Investigation of this outbreak is still ongoing and additional patients may be identified nationally and in West Virginia.

Multidrug-Resistant Organism (MDRO) Outbreaks

MDRO outbreaks continued to be reported in West Virginia during 2012 after being reported for the first time in 2011. MDROs are defined as microorganisms, predominantly bacteria, that are resistant to one or more class of antimicrobial agents. MDRO outbreaks are defined as “an increase in the number of MDRO cases above and beyond the endemic level (baseline level) in certain facility/unit in a specific time period. MDROs represent a major public health threat in the U.S. and in WV. These bacteria can spread rapidly and associated with high morbidity and mortality rates due to limited options for treatment.

In 2012, there were 9 outbreaks of MDROs reported by 6 counties in 6 surveillance regions (Figure 17). Four outbreaks were reported from acute care facilities, 3 from LTCFs, one from a rehabilitation facility and one from multiple acute and long-term care facilities. Table 19 depicts MDRO outbreak by etiologic agent.

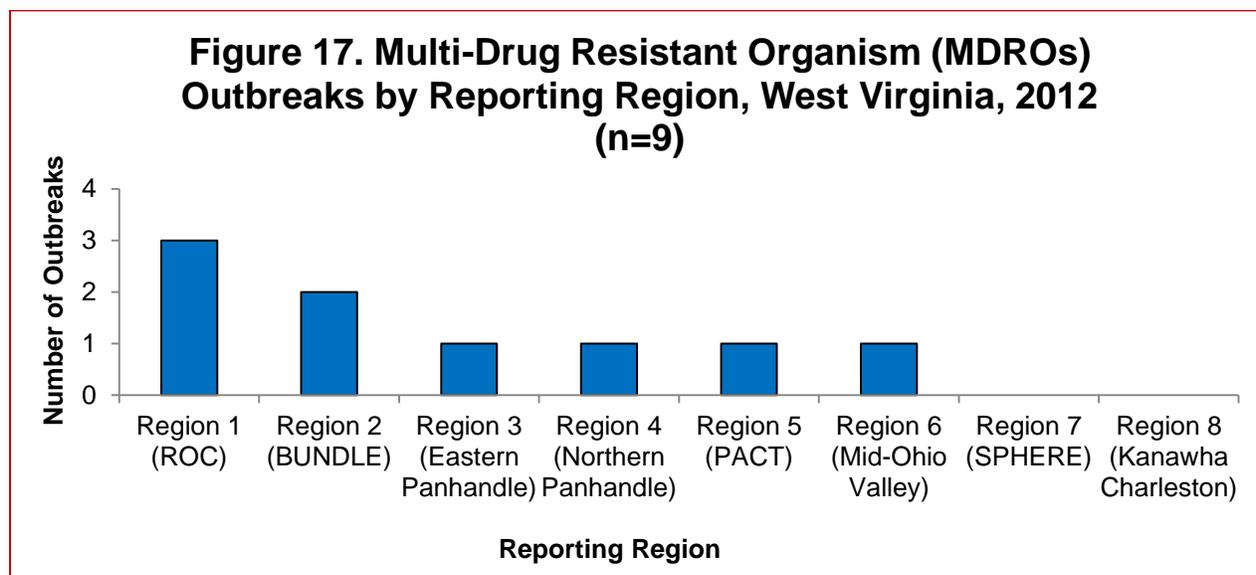


Table 19. Healthcare-associated MDRO Outbreaks by Etiologic Agent, West Virginia, 2012 (n=9)

Etiologic Agent	Number of Outbreaks	Percent
MDR-<i>Acinetobacter baumannii</i>	4	44.4
Carbapenem-Resistant <i>Klebsiella pneumoniae</i> (CRKP)	2	22.1
Carbapenem-Resistant <i>Enterobacteriaceae</i> (CRE)	1	11.1
Extended-Spectrum Beta-Lactamase-producing <i>Escherichia coli</i>	1	11.1
Vancomycin-Intermediate Resistant <i>Staphylococcus aureus</i> (VISA)	1	11.1
Total	9	100

In 2012, there was one regional outbreak of CRE that involves multiple healthcare facilities including acute and long-term care facilities. CRE isolates identified in this outbreak included carbapenem-resistant *Klebsiella pneumoniae* (CRKP), carbapenem-resistant *Enterobacter cloacae* (CREC), and carbapenem-resistant *Enterobacter aerogenes*. CDC was consulted in this investigation. Molecular analysis of four isolates at CDC laboratory indicated that all 4 isolates were unrelated which suggests that the outbreak is not due to common source exposure. Between September 2011 and April 2013, a total of 45 cases were identified only through laboratories of several acute care hospitals in the region. The majority of cases were CRKP (32), followed by CREC (11). Additionally, one patient had both CRKP and CREC and one patient had carbapenem-resistant *Enterobacter aerogenes*. This may underestimate the prevalence of CRE in the region since several LTCFs have their own private laboratories that may or may not test for carbapenem resistance. CRE colonized or infected patients usually seek medical care in more than one healthcare facility and act as a reservoir of infection among healthcare facilities. The widespread of CRE in the region can be explained by frequent transfer of patients among healthcare facilities.

DIDE is collaborating with the LHDs in the region to implement CDC recommendations to prevent further spread of CRE through coordinated regional control efforts among health care facilities. A regional group consists of DIDE, LHDs, Infection Preventionists (IPs) from acute and long-term care facilities are meeting regularly to assess implementation of appropriate control measures, review data when available, discuss progress in each individual facility, and exchange experience and ideas among IPs. There has been marked progress among acute care facilities in implementing control measure and decrease the incidence of CRE in their facilities. However LTCFs should consider regularly attending these regional meetings, consulting with their LHDs

regarding any increase in their facilities incidence of CRE, and keeping an open dialogue with the IPs of their neighboring acute care hospitals.

Two additional CRKP outbreaks were reported in LTCFs. One facility had only one case and the other had two cases. Surveillance cultures of epidemiologically linked individuals revealed no additional cases suggesting that there was no ongoing transmission in these facilities due to implementing stringent infection control measures.

One outbreak of MDR-*Acinetobacter baumannii* (MDR-Ab) was reported in a specialty care unit in an acute care facility. A total of 10 patients were diagnosed with MDR-Ab after 48 hours from admission to the facility over three week period. All isolates had a uniquely similar antimicrobial susceptibility pattern. All patients received mechanical ventilation. The usual risk factors for MDR-Ab include mechanical ventilation; wounds, environmental source of infection, prolonged hospital stay, ICU stay, prior antibiotic use, breakdown in infection control practices, such as poor hand hygiene, and patient comorbidities. The facility responded immediately to address any identified breach in infection control. The outbreak appears to have been abated through increased infection control efforts, including increasing compliance with hand hygiene and contact precautions, enhancing environmental cleaning, cohorting patients and staff, using dedicated equipment for patients, evaluating and monitoring respiratory therapy practices for handling and processing respiratory equipment, and tracking MDR-Ab positive patients upon readmission. No further cases were identified in this outbreak.

Another outbreak of MDR-Ab was reported from a rehabilitation facility. Four cases were identified. No additional cases were identified after the facility implemented appropriate infection control measures, intensified environmental cleaning and modified their wound care practices.

Two related outbreaks of MDR-Ab were reported in one region from two acute care hospitals. Initial investigation identified other health care facilities involved in these two outbreaks. However the investigation focused on two acute care hospitals and an outpatient specialty clinic. CDC was consulted in this investigation. Several site visits to these three facilities were completed by DIDE in collaboration with the regional epidemiologist and LHD. The purpose of the site visits was to discuss the epidemiologic findings with staff, assess infection control practices, evaluate practices related to respiratory therapy and wound care, interview pertinent staff, perform retrospective chart review, collect environmental samples and provide recommendations to prevent further spread. Molecular analysis of MDR-Ab isolates at CDC laboratory indicated that most isolates were genetically unrelated suggesting that these two outbreaks were not due to a common source. Epidemiologic investigation initially identified 32 MDR-Ab positive patients. Additional patients have been identified throughout the ongoing investigation. Multiple infection control breaches may have contributed to MDR-Ab transmission. In conclusion, these two outbreaks represent a widespread, long-standing regional outbreak involving multiple healthcare facilities. Most patients were admitted to multiple acute and long-term care facilities. Chronic wound infection was the primary risk factor. Investigation of this outbreak is still

ongoing. DIDE and LHDs are also implementing a coordinated regional approach among healthcare facilities to implement the appropriate infection control measures as discussed previously.

One outbreak of Extended-Spectrum Beta-Lactamase-producing *Escherichia coli* (ESBL E coli) was reported in a LTCF. Initially, five cases were identified. No additional cases were identified after the facility intensified infection control measures and revised their usage of urinary catheters by implementing the CDC/SHEA recommendations to prevent catheter-associated urinary tract infection. Investigation of this outbreak was challenging because of continuous staff turnover in the facility and lack of communication among leaving and new staff.

A case of vancomycin-intermediate resistant *Staphylococcus aureus* (VISA) was reported from an acute care facility. One case of VISA or VRSA is considered an outbreak. CDC was consulted in this outbreak and laboratory confirmation was done at CDC. Since resistance to vancomycin was relatively low CDC recommendations were to manage this case similarly to a case of methicillin-resistant *Staphylococcus aureus* (MRSA).

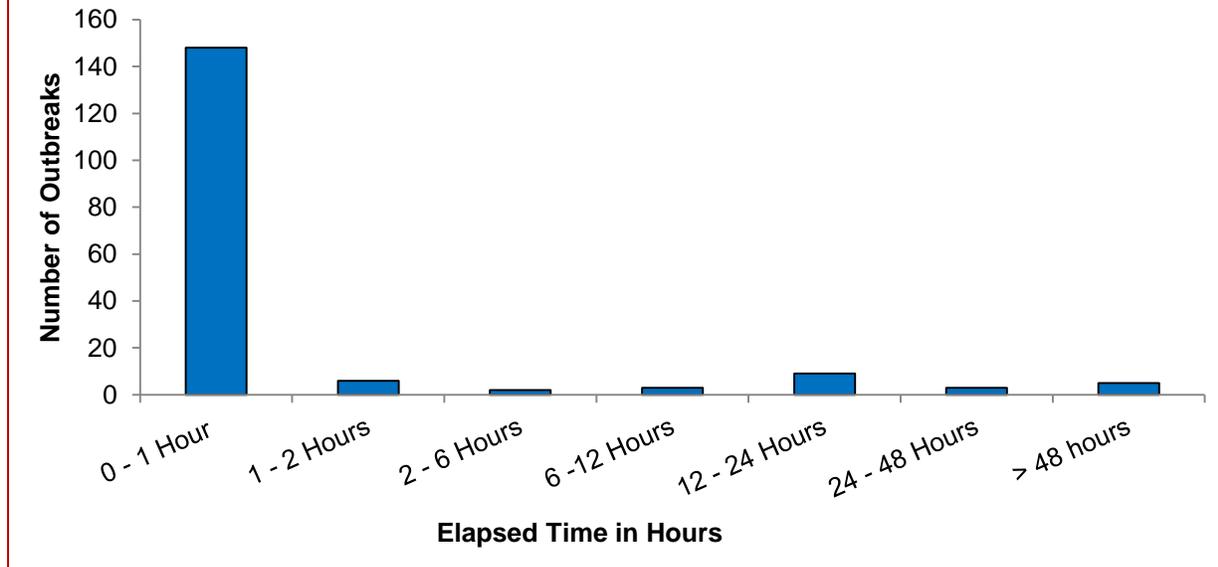
Outbreak Reporting Time

In West Virginia, outbreaks are immediately reportable to the local health department. According to infectious disease rules and regulations and as a condition of receiving threat preparedness funding local health departments are required to report immediately suspected outbreaks or clusters to the Bureau for Public Health, Division of Infectious Disease Epidemiology (DIDE) within 60 minutes.

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

In 2012, date and time of report to the local health department and state health department were collected in all outbreaks. The mean and median of hours elapsed between the time the outbreak was reported to the local health department and the time the outbreak was reported to the state health department was 7.4 hours and 0 hours respectively. The range of hours between the time the outbreak was reported to the local health department and the time the outbreak was reported to the state health department was 0 to 480 hours. Of the 176 outbreaks where date of notification was known for the state and local health department, same-day notification occurred for 168 (95.5%) outbreaks (Figure 18).

Figure 18. Elapsed Time for Reporting Outbreaks Between State and Local Health Departments, West Virginia, 2012 (n=176)



DIDE Recommendations

There has been remarkable improvement in recognition and reporting of outbreaks in West Virginia over the last decade. This improvement can be attributable to strengthened public health infrastructure, increased awareness among healthcare providers and public health staff, and training and education. Despite this marked progress, there are still opportunities for improvements. The following summarizes our findings and provides recommendations:

Findings and Recommendations for Local Health Departments

1. Outbreaks are immediately notifiable in West Virginia and should be reported to the Bureau for Public Health, DIDE within 60 minutes. 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 CDC and other partners on critical health issues.
2. The role of laboratory testing is crucial in outbreak management. West Virginia Office of Laboratory Services (OLS) continues to add advanced testing technology to assist in early detection and investigation of outbreaks. Timely collection of specimens facilitates diagnosis and institution of control measures. Recently OLS has added the following testing capacities:
 - Film Array multiplex PCR to test for respiratory pathogens. .

- Molecular strain typing for MDROs in case of outbreaks through rep-PCR technology using the bioMérieux DiversiLab System
3. Outbreak investigation requires teamwork and extensive efforts, resources, time, and cooperation among several partners.
 4. Strengthen your relationship and maintain an open dialogue with acute and long-term care facilities' IPs and school nurses.
 5. Consider consulting with your regional epidemiologists in outbreak investigation. They have experience to assist their LHDs in outbreak investigation. Additionally, participation in outbreak investigation is considered a performance measure by several funding sources.
 6. Regional epidemiologists should act as a resource for their region and provide assistance to LHDs in outbreak investigation. They also should provide training to LHD staff, particularly new staff, and other partners and help to maintain open dialogue between LHDs and IPs, laboratories, healthcare providers, school nurses, etc.
 7. Foodborne disease outbreaks are not uncommon and can cause serious illness. The timely response to foodborne illness reports is crucial to control outbreaks and identify potential sources. Obtaining laboratory samples is critical to guide the recommendations and allow confirmation of potential common transmission sources.
 8. Laboratory testing for the frequently occurring person to person enteric outbreaks is recommended to confirm the outbreak and assist in directing control measures. Testing is also a requirement to get funded by CDC through the Epidemiology and Laboratory Capacity (ELC) grant.
 9. The use of standard outbreak protocols has tremendous impact on improving outbreak investigation and control. DIDE has developed several outbreak toolkits for the most commonly encountered outbreaks, such as influenza, pneumonia, norovirus, and scabies. Toolkits for investigating MDROs and CDI outbreaks in LTCFs were also developed.
 10. Outbreaks in LTCFs constitute the majority of outbreaks in the state. Therefore, consider communicating with your LTCFs on regular basis. Managing outbreaks in LTCFs requires understanding of appropriate infection control measures in these facilities and the challenges in implementing such measures.
 11. Respiratory outbreaks in LTCFs may be severe and occasionally associated with high morbidity and mortality among residents. Consider communicating and educating your LTCFs IPs during the pre-influenza season on
 - Identifying and managing respiratory outbreaks.
 - Collecting appropriate specimens.
 - Marring standing orders for influenza testing and chemoprophylaxis.
 - Implementing appropriate infection control measures.
 12. MDRO Outbreaks are not uncommon and represent a major public health threat. Management of these outbreaks is time and resource consuming. Early detection and containment of these organisms is the best control measure. Regular training in investigating MDRO outbreaks is recommended.

13. Influenza outbreaks in schools are frequent and may cause severe illness among at-risk populations. To be prepared for influenza outbreaks in schools consider the following recommendations:
 - Recruit and maintain a functional sentinel provider
 - Communicate with your school nurses in a regular basis and provide training as needed.
 - Identify a healthcare provider/facility to assist you in collecting specimens from schools in outbreak situation
 - Keep 5 influenza testing kits in the health department throughout the year.
 - Influenza vaccination is the best preventive measures.
 - School closing should not be considered a first option in managing influenza outbreaks or any other school outbreaks. The decision to close a school in outbreak situation should be made on a case by case basis after consulting with DIDE and other pertinent partners and meeting the criteria set forth by federal, state and local public health agencies.
14. Make sure to share with your partners, in a timely manner, DIDE's weekly influenza activity report and monthly outbreak report.
15. As a requirement for threat preparedness funding the LHDs are required to complete a final outbreak report for each outbreak. The report should include the minimal elements set by CDC and be shared with DIDE and other pertinent partners. DIDE is assisting LHDs by designing template reports for most outbreak types.

Observations and recommendations to LTCFs:

- 1- LTCFs continue to account for the majority of HAOs reported in the state. These outbreaks are occasionally severe and associated with high morbidity and mortality rates.
- 2- Identification and management of outbreaks in LTCFs can be challenging for the facility staff, healthcare providers and public health because of the following obstacles:
 - a- Lack of dedicated infection preventionists (IPs) in each facility. IPs usually have multiple responsibilities in addition to infection control.
 - b- Limited resources for the (IPs) particularly in training and education.
 - c- Staffing issues, such as rapid turn-over, occasional understaffing, and lack of regular training in infection control.
 - d- Scarce on-site physician availability.
 - e- Excessive use of antibiotics
 - f- Low technology setting, limited diagnostic tools, and scarce resources
 - g- Low immunization rates especially among staff
 - h- Challenges in balancing infection control measures and psychosocial needs of the residents.
 - i- Inconsistent utilization of existing surveillance system
- 3- Influenza and other respiratory outbreaks
 - Provide flu vaccine to your residents and staff
 - Report outbreaks immediately to your LHD

- Work with your LHD to collect and send respiratory specimens to OLS in case of an outbreak. Laboratory testing is provided by OLS at no charge to you or your patients
 - Maintain standing order for influenza vaccination, collecting respiratory specimens, mainly nasopharyngeal swabs, and providing influenza chemoprophylaxis in an outbreak situation.
 - Check DIDE website for up-to-date information and outbreak toolkits.
- 4- MDRO outbreaks: LTCFs' residents may act as reservoirs for MDROs and facilitate transmission of these infections across the spectrum of health care. Additionally, some LTCFs contract either out-of-state or in-state laboratories that do not test or test and do not report MDRO status to these facilities. This represents a major challenge for these facilities to identify and manage MDRO outbreaks. DIDE recommends the following:
- Make sure that your laboratory tests for and reports MDRO cases immediately.
 - Report any unusual increase in incidence of MDRO cases immediately to your LHD.
 - Maintain an ongoing surveillance for all MDRO cases.
 - Learn the concepts of contact isolation in LTCFs.
 - Follow CDC and DIDE guidelines to control MDRO outbreaks.
 - Communicate and exchange knowledge and expertise with the IPs at your neighboring acute care facilities.
 - Train and educate staff, residents, and families on MDROs as needed.

Observations and recommendations for acute care hospitals

- 1- In 2012 there were only 10 outbreaks reported from acute care facilities which may not reflect the actual incidence of outbreaks in these facilities. DIDE can provide assistance, expertise and laboratory support, if needed, to investigate outbreaks in acute care facilities. DIDE also work closely with CDC in investigating the more complicated HAOs.
- 2- Outbreaks should be reported immediately to LHDs. The new reportable disease role will be effective in July, 2013.
- 3- New DIDE protocol for healthcare associated outbreak investigation will be posted online by July, 2013.
- 4- OLS can provide molecular analysis of bacterial isolates for the purpose of MDRO outbreak investigation.
- 5- MDRO outbreaks are challenging and represent a major burden for healthcare facilities, providers and public health and are associated with high morbidity and mortality rates due to the limited or no availability of treatment options.
- 6- Since MDRO outbreaks affect all healthcare facilities in a geographical area or a region, regional approach is the most effective way to prevent the emergence and further spread of these infections.

DIDE's Objectives:

The following are objectives completed in 2012, ongoing objectives and new objectives in 2013 and beyond:

- 1- DIDE continues to improve feedback of information on outbreaks and outbreak investigations during 2012 and beyond. In addition to the yearly outbreak report, DIDE continue to release via email a monthly report on outbreaks to provide timely details on reported outbreaks in the state to public health partners and healthcare providers. The monthly report is also posted on the website.
- 2- DIDE will continue to participate in electronic reporting of all enteric outbreaks in the National Outbreak Reporting System (NORS).
- 3- DIDE is committed to providing regular training on outbreak management to the state, regional and local public health personnel. A state-wide training in outbreak investigation was held in May 2013.
- 4- DIDE developed a new toolkit for rash illness outbreaks in sports teams. DIDE will continue to develop new toolkits and protocols to assist partners in outbreak investigation and to maintain its website with up-to-date information. DIDE's web site is www.dide.wv.gov
- 5- DIDE developed templates for final outbreak reports for influenza and enteric outbreaks caused by person to person transmission to assist LHDs meeting the requirement of threat preparedness grant. Final outbreak report templates for scabies and vaccine preventable disease outbreaks were also developed for implementation during 2013.
- 6- Healthcare-Associated Outbreaks:
 - DIDE developed a training curriculum on MDROs. Training was provided in each surveillance region. The target audience was IPs at acute and long-term care facilities and public health staff. A total of 418 healthcare professionals attended the nine regional trainings as follows: 177 from LTCFs, 69 from acute care facilities, 144 public health staff and 28 others.
 - The reportable disease rule has been revised including healthcare associated outbreaks in the list of reportable conditions to be effective July 2013.
 - WVOLS has the ability to provide molecular typing of MDROs during outbreaks. Additionally, OLS is working to provide antimicrobial susceptibility testing during 2013.
 - The findings from this report will be presented to the HAI Advisory Group as well as WV APIC section as a part of annual needs assessment.
 - DIDE continues to make resources available for state and regional epidemiologists to attend national trainings and conferences in HAIs and HAOs.
 - Continue to work with partners including Council of State and Territorial Epidemiologists (CSTE), CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments.

- DIDE is hosting a CSTE HAI fellow epidemiologist for a two-year training. The fellow's assignments and projects are aiming to assist DIDE in implementing 2013 and 2014 HAI plans and improve detection and management of HAO. These projects include but are not limited to:
 - a- Evaluation of surveillance of respiratory outbreaks in LTCFs
 - b- Baseline prevention practices for CDI and CRE in acute and long-term care facilities.
 - c- Evaluation of laboratory practices in WV regarding CRE testing and reporting.

Appendix Summary Outbreak Tables for 2012, West Virginia

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
1	1/3/2012 9:20	1/3/2012 9:45	0	25	Region 6 (Mid-Ohio Valley)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 28/40 (AR 70%)	Lab Confirmed	LTCF	Person to Person
2	1/4/2012 10:30	1/4/2012 10:45	0	15	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 14/23 (AR 61%)	Lab test not done	LTCF	Person to Person
3	1/6/2012 9:00	1/6/2012 9:15	0	15	Region 5 (PACT)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 34/117 (AR 29%)	Lab Confirmed	LTCF	Person to Person
4	1/5/2012 14:45	1/6/2012 14:30	24	1425	Region 5 (PACT)	WV	Acute Respiratory Syndrome	Human Metapneumovirus (hMPV)	Residents 28/83 (AR 34%) Staff 16/74 (AR 22%)	Lab Confirmed	LTCF	Person to Person
5	1/6/2012 14:40	1/6/2012 14:45	0	5	Region 5 (PACT)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 22/104 (AR 21%) Staff 21/138 (AR 15%)	Lab Confirmed	LTCF	Person to Person
6	1/9/2012 12:00	1/9/2012 12:45	0	45	Region 5 (PACT)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 31/56 (AR 55%) Staff 26/74 (35%)	Lab Confirmed	LTCF	Person to Person
7	1/10/2012 11:15	1/10/2012 11:33	0	18	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Residents 3/116 (AR 3%) Staff 10/170 (AR 6%)	Lab test not done	LTCF	Person to Person
8	1/11/2012 13:15	1/11/2012 13:00	0	16	Region 3 (Eastern Panhandle)	WV	Pertussis (Whooping cough)	<i>Bordetella pertussis</i>	11 cases	Lab Confirmed	Community	Person to Person
9	1/11/2012 13:19	1/11/2012 13:00	0	20	Region 4 (Northern Panhandle)	WV	Pertussis (Whooping cough)	<i>Bordetella pertussis</i>	12 cases	Lab Confirmed	Community	Person to Person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
10	1/11/2012 15:30	1/11/2012 16:30	1	60	Region 8 (Kanawha Charleston)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 43/90 (AR 48%) Staff 19/100 (AR 19%)	Lab Confirmed	LTCF	Person to Person
11	1/12/2012 9:00	1/12/2012 9:36	0	36	Region 5 (PACT)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 27/130 (AR 21%) Staff 9/132 (AR 7%)	Lab Confirmed	LTCF	Person to Person
12	1/12/2012 13:11	1/12/2012 13:17	0	6	Region 5 (PACT)	WV	Acute Respiratory Syndrome	Undetermined	Residents 14/89 (AR 14%)	Lab test negative or noncontributory	LTCF	Person to Person
13	1/12/2012 13:20	1/12/2012 13:47	0	27	Region 1 (ROC)	WV	Norovirus Gastroenteritis/ CDI	Norovirus and C. Diff	Residents 31 and Staff 17 with Gastroenteritis; Residents 6 with CDI	Lab Confirmed	LTCF	Person to Person
14	1/12/2012 13:48	1/12/2012 13:58	0	10	Region 5 (PACT)	WV	Norovirus Gastroenteritis	Norovirus	Residents 53/87 (AR 61%) Staff 32/113 (AR 28%)	Lab Confirmed	LTCF	Person to Person
15	1/17/2012 10:05	1/17/2012 10:17	0	12	Region 4 (Northern Panhandle)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 87 and Staff 27	Lab Confirmed	LTCF	Person to Person
16	1/17/2012 11:10	1/17/2012 11:14	0	4	Region 5 (PACT)	WV	Hand Foot and Mouth Disease	Undetermined	Attendees 14/16 (AR 88%)	Lab test not done	Day Care	Person to Person
17	1/17/2012 11:54	1/17/2012 12:05	1	11	Region 5 (PACT)	WV	Norovirus Gastroenteritis	Norovirus G2	Employees 38/200 (AR 19%) Residents 36/55 (AR 65%)	Lab Confirmed	LTCF	Person to Person
18	1/17/2012 16:16	1/17/2012 16:16	0	0	Region 4 (Northern Panhandle)	WV	Invasive Group A streptococcus	Group A streptococcus (GAS)	4 cases	Lab Confirmed	Community	Undetermined

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
19	1/19/2012 14:50	1/19/2012 14:57	0	7	Region 6 (Mid-Ohio Valley)	WV	Impetigo	Undetermined	5 cases	Lab test not done	School	Person to Person
20	1/19/2012 14:24	1/19/2012 15:15	1	51	Region 8 (Kanawha Charleston)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 41/115 (AR 36%) Staff 22/135 (AR 16%)	Lab Confirmed	LTCF	Person to Person
21	1/20/2012 13:00	1/20/2012 13:45	0	45	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Residents 32/80 (AR 40%) Staff 33/61 (AR 54%)	Lab test not done	LTCF	Person to Person
22	1/20/2012 15:00	1/20/2012 16:00	1	60	Region 8 (Kanawha Charleston)	WV	Acute Gastroenteritis	Undetermined	Residents 11/60 (AR 18%) Staff 9/70 (AR 13%)	Lab test not done	LTCF	Person to Person
23	1/23/2012 14:00	1/23/2012 14:42	0	42	Region 4 (Northern Panhandle)	WV	Acute Gastroenteritis	Undetermined	Residents 10 and Staff 4	Lab test negative or noncontributory	LTCF	person to person
25	1/24/2012 14:15	1/24/2012 14:50	0	35	Region 8 (Kanawha Charleston)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 51/120 (AR 43%) Staff 14/120 (AR 12%)	Lab Confirmed	LTCF	Person to Person
26	1/25/2012 11:00	1/25/2012 11:30	0	30	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Students 77/492 (AR 16%)	Lab test not done	School	Person to Person
27	1/26/2012 8:50	1/26/2012 9:27	1	37	Region 2 (BUNDLE)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 45/120 (AR 38%) and Staff 43	Lab Confirmed	LTCF	Person to Person
28	1/26/2012 15:50	1/26/2012 16:19	1	29	Region 4 (Northern Panhandle)	WV	Acute Gastroenteritis	Undetermined	Residents 3/52 (AR=6%)	Lab test not done	LTCF	Person to Person
29	1/27/2012 10:45	1/27/2012 11:10	1	25	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 16/30 (AR 53%) Staff 8	Lab test not done	LTCF	Person to Person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
30	1/27/2012 10:30	1/27/2012 11:00	1	30	Region 1 (ROC)	WV	Acute Respiratory Syndrome	Undetermined	Residents 17/90 (AR 19%)	Lab test negative or noncontributory	LTCF	Person to Person
32	1/30/2012 9:23	1/30/2012 10:45	1	82	Region 5 (PACT)	WV	Acute Respiratory Syndrome	Undetermined	Residents 6/151 (AR4%) Staff 2/50 (4%)	Lab test not done	LTCF	Person to Person
33	1/30/2012 13:00	1/30/2012 13:45	0	45	Region 7 (SPHERE)	WV	Herpes gladiatorum	Undetermined	Athletes 5/15 (AR 33%)	Lab test negative or noncontributory	Sports Team	Person to Person
34	1/30/2012 14:00	1/30/2012 14:56	0	56	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Students 79/389 (AR 20%)	Lab test not done	School	Person to Person
35	1/31/2012 9:45	1/31/2012 10:30	1	45	Region 3 (Eastern Panhandle)	CD C	Campylobacter Gastroenteritis	Campylobacter	Cases 3 confirmed and 11 probable.	Lab Confirmed	Community	Point Source
36	1/30/2012 14:45	1/30/2012 14:00	0	46	Region 2 (BUNDLE)	WV	Mumps	Mumps virus	Students 1	Lab Confirmed	School	Undetermined
37	2/1/2012 8:54	2/1/2012 9:04	1	10	Region 4 (Northern Panhandle)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 38 and Staff 9	Lab Confirmed	LTCF	person to person
38	2/1/2012 9:30	2/1/2012 9:45	0	15	Region 1 (ROC)	WV	Varicella	Undetermined	Students 18	Lab test not done	School	person to person
40	2/1/2012 13:30	2/1/2012 13:45	0	15	Region 6 (Mid-Ohio Valley)	WV	Norovirus Gastroenteritis	Norovirus	Residents 27/50 (AR 54%) Staff 42/100 (AR 42%)	Lab Confirmed	LTCF	person to person
41	2/1/2012 11:00	2/1/2012 11:30	0	30	Region 4 (Northern Panhandle)	WV	<i>Streptococcus</i> pharyngitis	Group A streptococcus (GAS)	Students 12	Rapid test positive	School	Person to Person

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42	2/3/2012 10:35	2/3/2012 10:52	0	17	Region 7 (SPHERE)	WV	Acute Respiratory Syndrome	Undetermined	Residents 10/102 (AR 10%)	Lab test negative or noncontributory	LTCF	Person to Person
44	2/9/2012 8:45	2/9/2012 9:16	1	31	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Inmates 25	Lab test not done	Correctional Facility	Person to Person
45	2/9/2012 9:30	2/9/2012 10:16	1	46	Region 3 (Eastern Panhandle)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 25/118 (AR 21%)	Lab Confirmed	LTCF	Person to Person
46	2/9/2012 10:30	2/9/2012 11:10	1	40	Region 8 (Kanawha Charleston)	WV	Scabies	Undetermined	Students:15; Staff 3; Family members 2	Lab test not done	School	Person to Person
47	2/9/2012 9:17	2/9/2012 11:33	2	136	Region 5 (PACT)	WV	Fifth's Disease	Undetermined	Students 21/580 (AR 4%)	Lab test not done	School	Person to Person
49	2/13/2012 10:00	2/13/2012 10:15	0	15	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Residents 7/10 (AR 70%) and Staff 12/14 (AR 86%)	Lab test not done	LTCF	Person to Person
50	2/13/2012 11:45	2/13/2012 12:25	1	40	Region 8 (Kanawha Charleston)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 14/25 (AR 56%) Staff 12/65 (AR 18%)	Lab Confirmed	LTCF	Person to Person
52	2/14/2012 8:30	2/14/2012 9:00	1	30	Region 2 (BUNDLE)	WV	Norovirus Gastroenteritis	Norovirus G2	Patients 9 and Staff 13	Lab Confirmed	Hospital	person to person
53	2/17/2012 9:00	2/17/2012 9:20	0	20	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 6	Lab test negative or noncontributory	LTCF	Undetermined
54	2/17/2012 10:30	2/17/2012 10:45	0	15	Region 3 (Eastern Panhandle)	WV	Norovirus Gastroenteritis	Norovirus G2	Patients 6	Lab Confirmed	Hospital	person to person

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55	2/17/2012 10:00	2/17/2012 10:20	0	20	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Residents 8/10 (80%) Staff 4/12 (33%)	Lab test not done	LTCF	person to person
56	2/17/2012 11:30	2/17/2012 11:48	0	18	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Residents 15/53 (AR 28%) and Staff 8/85 (AR 9%)	Lab test not done	LTCF	person to person
57	2/21/2012 9:40	2/21/2012 10:15	1	35	Region 2 (BUNDLE)	WV	Norovirus Gastroenteritis	Norovirus	Residents 19/52 (AR 37%) Staff 8	Lab Confirmed	LTCF	Person to Person
58	2/21/2012 9:08	2/21/2012 10:45	1	97	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 58/94 (AR 62%); Staff 19/130 (AR 15%)	Lab test not done	LTCF	Person to Person
59	2/21/2012 14:30	2/21/2012 14:30	0	0	Region 6 (Mid-Ohio Valley)	WV	Acute Conjunctivitis	Undetermined	Students 23/221 (AR 10%) and Staff 1	Lab test not done	School	Person to Person
60	2/22/2012 16:15	2/22/2012 16:30	0	15	Region 5 (PACT)	WV	Urinary Tract Infection	ESBL E. Coli	Residents 5/90 (AR 6%)	Lab Confirmed	LTCF	Person to Person
61	2/24/2012 15:05	2/24/2012 14:45	2	21	Region 5 (PACT)	WV	Acute gastroenteritis	Undetermined	Residents 29/102 (AR 28%)	Lab test not done	LTCF	Person to Person
62	2/27/2012 10:25	2/27/2012 10:37	0	12	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 55/83 (AR 66%)	Lab test not done	LTCF	Person to Person
63	2/27/2012 11:55	2/27/2012 0:06	12	710	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 54/56 (AR 96%)	Lab test negative or noncontributory	LTCF	Person to Person
64	2/29/2012 10:45	2/29/2012 11:42	1	57	Region 6 (Mid-Ohio Valley)	WV	Acute Gastroenteritis	Undetermined	Students Approx. 95/555 (AR 17%)	Lab test negative or noncontributory	School	Person to Person

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65	2/29/2012 12:50	2/29/2012 13:03	1	13	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 21/56 (AR 38%) Staff 6/85 (AR 7%)	Lab test not done	LTCF	Person to Person
66	2/29/2012 14:00	2/29/2012 14:18	0	18	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 36/68 (AR 53%) and Staff 36/100 (36%).	Lab test not done	LTCF	Person to Person
67	3/5/2012 10:45	3/5/2012 11:05	1	20	Region 6 (Mid-Ohio Valley)	WV	Scabies	Undetermined	Students 12 Teacher 1	Lab test not done	School	Person to Person
68	3/5/2012 10:15	3/5/2012 11:25	1	70	Region 3 (Eastern Panhandle)	WV	Influenza	Influenza B	8/30 (AR 27%)	Rapid test positive but not culture confirmed	LTCF	Person to Person
69	3/5/2012 12:55	3/5/2012 13:05	1	10	Region 7 (SPHERE)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 37/106 (AR 35%) and Staff 13	Lab Confirmed	LTCF	Person to Person
70	3/8/2012 13:00	3/8/2012 13:20	0	20	Region 8 (Kanawha Charleston)	WV	Acute Gastroenteritis	Undetermined	Residents 21/91 (AR 23%) Staff 4	Lab test negative or noncontributory	LTCF	Person to Person
71	3/9/2012 10:00	3/9/2012 10:30	0	30	Region 1 (ROC)	WV	Acute Respiratory Syndrome	Human Metapneumovirus (hMPV)	Residents 23/82 (AR 28%)	Lab Confirmed	LTCF	Person to Person
72	3/9/2012 15:00	3/9/2012 15:20	0	20	Region 6 (Mid-Ohio Valley)	WV	Influenza / <i>Streptococcus</i> Pharyngitis	Influenza A H3	Highest Absentee Rate 18%	Lab Confirmed	School	Person to Person
73	3/12/2012 10:00	3/12/2012 10:30	0	30	Region 1 (ROC)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 24/82 (AR 29%)	Lab Confirmed	LTCF	Person to Person

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74	3/12/2012 12:35	3/12/2012 12:45	0	10	Region 4 (Northern Panhandle)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 48	Lab Confirmed	LTCF	Person to Person
75	3/13/2012 13:35	3/13/2012 13:47	0	12	Region 1 (ROC)	WV	Influenza	Influenza A	Students 11	Rapid test positive but not culture confirmed	School	Person to Person
76	3/13/2012 13:00	3/13/2012 14:30	1	90	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Residents 9; Staff 5	Lab test not done	LTCF	Person to Person
77	3/14/2012 15:00	3/14/2012 15:40	0	40	Region 6 (Mid-Ohio Valley)	WV	Influenza	influenza A H3	Residents 29/97 (AR 30%) Staff 10/128 (AR 8%)	Lab Confirmed	LTCF	Person to Person
78	3/16/2012 13:30	3/16/2012 13:20	0	11	Region 1 (ROC)	WV	Scabies	Undetermined	Inmates 3	Lab test not done	Correctional Facility	Person to Person
79	3/20/2012 13:00	3/20/2012 13:15	0	15	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 16/52 (AR 31%) and Staff 5/60 (AR 8%)	Lab test not done	LTCF	Person to Person
80	3/20/2012 12:45	3/20/2012 13:40	1	55	Region 1 (ROC)	WV	Influenza	Influenza A & B	Students 16	Rapid test positive but not culture confirmed	School	Person to Person
81	3/21/2012 14:15	3/21/2012 16:00	2	105	Region 5 (PACT)	WV	Fifth's Disease	Undetermined	Students 40/525 (AR 8%)	Lab test not done	School	Person to Person

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82	3/21/2012 15:30	3/22/2012 9:46	18	1096	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Employees 8/12 (AR 67%) Patrons 17/27 (AR 63%)	Lab test not done	Restaurant	Undetermined
83	3/22/2012 12:00	3/22/2012 12:30	0	30	Region 6 (Mid-Ohio Valley)	WV	Urinary Tract Infection	Carbapenem-Resistant <i>Klebsiella pneumonia</i> (CRKP)	Resident 1	Lab Confirmed	LTCF	person to person
84	3/30/2012 10:30	3/30/2012 10:50	0	20	Region 6 (Mid-Ohio Valley)	WV	Fifth's Disease	Undetermined	Students 5	Lab test not done	School	Person to Person
85	3/30/2012 11:30	3/29/2012 17:00	19	1111	Region 1 (ROC)	WV	Multiple Clinical Presentations	Carbapenem-Resistant <i>Klebsiella pneumonia</i> (CRKP)	Missing	Lab Confirmed	Hospital	Person to Person
86	4/2/2012 9:30	4/2/2012 9:45	0	15	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 14	Lab test not done	LTCF	Person to Person
88	4/2/2012 14:45	4/2/2012 15:04	1	19	Region 8 (Kanawha Charleston)	WV	Acute Gastroenteritis	Undetermined	Residents 23/60 (AR 38%); Staff 4	Lab test negative or noncontributory	LTCF	Person to Person
89	4/5/2012 10:54	4/5/2012 11:30	1	36	Region 8 (Kanawha Charleston)	WV	Influenza	influenza A H3	Residents 4/4 (AR 100%) and Staff 4/8 (AR 50%)	Lab Confirmed	LTCF	Person to Person
90	4/4/2012 12:00	4/4/2012 15:15	3	195	Region 4 (Northern Panhandle)	WV	Influenza	influenza A H3	Residents 33 (AR 33%)	Lab Confirmed	LTCF	Person to Person

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91	4/5/2012 11:00	4/6/2012 10:30	23	141 0	Region 5 (PACT)	WV	STEC Gastroenteritis	Shiga toxin- producing <i>Escherichia coli</i> (STEC)	Confirmed 1 Probable 1	Lab Confirmed	Family Gathering	Probable Point Source
92	4/11/201 2 13:30	4/11/201 2 14:10	1	40	Region 1 (ROC)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 42/53 (66%) and staff 38	Lab Confirmed	LTCF	Person to Person
93	4/12/201 2 15:00	4/13/201 2 10:15	19	115 5	Region 8 (Kanawha Charleston)	WV	Acute Gastroenteritis	Undetermined	Attendees 19/45 (AR 42%)	Lab test not done	Church Gathering	Probable Point Source
94	4/13/201 2 10:30	4/13/201 2 11:10	1	40	Region 5 (PACT)	WV	Influenza	influenza A H3	Residents 12/100 (AR 12%)	Lab Confirmed	LTCF	Person to Person
96	4/13/201 2 14:00	4/13/201 2 14:15	0	15	Region 2 (BUNDLE)	WV	Bloodstream Infection	Vancomycin- Intermediate Resistant <i>Staphylococcus aureus</i> (VISA)	Resident 1	Lab Confirmed	Hospital	Undetermi ned
97	4/13/201 2 12:30	4/11/201 2 13:30	48	282 1	Region 4 (Northern Panhandle)	WV	Acute Respiratory Syndrome	Undetermined	Residents 8	Lab test negative or noncontributo ry	LTCF	Person to Person
98	4/17/201 2 10:55	4/17/201 2 11:00	1	5	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 14 Staff 8	Lab test not done	LTCF	Person to Person
100	4/18/201 2 13:00	4/17/201 2 14:30	24	135 1	Region 1 (ROC)	CD C	Salmonellosis	<i>Salmonella Newport</i>	Cases 12	Lab Confirmed	Community	Point Source
101	4/19/201 2 15:30	4/19/201 2 16:00	1	30	Region 5 (PACT)	WV	Influenza	influenza A H3	Residents 59 Staff 6	Lab Confirmed	LTCF	person to person

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102	4/23/2012 8:30	4/23/2012 8:55	0	25	Region 1 (ROC)	WV	Norovirus Gastroenteritis	Norovirus G2	Residents 18/48 (AR 38%)	Lab Confirmed	LTCF	Person to Person
103	4/24/2012 13:15	4/24/2012 13:00	0	16	Region 1 (ROC)	WV	Acute Respiratory Syndrome	Undetermined	Residents 11	Lab test negative or noncontributory	LTCF	person to person
104	4/25/2012 14:00	4/25/2012 15:00	1	60	Region 8 (Kanawha Charleston)	WV	Hand Foot and Mouth Disease	Undetermined	Attendees 5/10 (AR 50%) and Parent 1	Lab test not done	Day Care	Person to Person
105	5/1/2012 15:00	5/1/2012 15:27	0	27	Region 8 (Kanawha Charleston)	WV	Acute Gastroenteritis	Undetermined	Patrons 11/25 (AR 44%)	Lab test not done	Restaurant	Probable Point Source
106	5/2/2012 14:30	5/2/2012 14:45	0	15	Region 5 (PACT)	WV	Influenza	influenza A H3	Residents 16/60 (AR 27%) and Staff 9	Lab Confirmed	LTCF	Person to Person
107	5/2/2012 18:40	5/2/2012 18:40	0	0	Region 5 (PACT)	WV	Folliculitis	Undetermined	Attendees 27	Lab test not done	Hotel	Probable Point Source
110	5/4/2012 10:40	5/4/2012 10:45	0	5	Region 2 (BUNDLE)	WV	Acute Gastroenteritis	Undetermined	Patients 12/30 (AR 40%) Staff 11/40 (AR 28%)	Lab test negative or noncontributory	Hospital	Person to Person
111	4/27/2012 12:00	5/4/2012 11:30	167	10050	Region 4 (Northern Panhandle)	WV	Influenza	Influenza A H3	Residents 23/137 (AR 17%) Staff 2/150, (AR 1.3%)	Lab Confirmed	LTCF	Person to Person
112	5/7/2012 23:30	5/7/2012 12:00	12	691	Region 1 (ROC)	WV	Acute Respiratory Syndrome	Rhinovirus	Residents: 29	Lab Confirmed	LTCF	Person to Person
113	5/10/2012 9:00	5/10/2012 9:20	0	20	Region 7 (SPHERE)	WV	Hand Foot and Mouth Disease	Undetermined	Attendees 12/108 (AR 11%)	Lab test not done	Day Care	Person to Person

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114	5/7/2012 12:30	5/7/2012 12:50	0	20	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 10 and Staff 7	Lab test negative or noncontributory	LTCF	Person to Person
115	5/14/2012 15:18	5/14/2012 14:40	2	39	Region 3 (Eastern Panhandle)	WV	Multiple Clinical Presentations	Carbapenem-Resistant <i>Klebsiella pneumonia</i> (CRKP)	Residents 2	Lab Confirmed	LTCF	Person to Person
116	5/14/2012 14:20	5/14/2012 15:00	1	40	Region 7 (SPHERE)	WV	Acute Gastroenteritis	Undetermined	Students 20/59 (AR 34%)	Lab test negative or noncontributory	School	Person to Person
117	5/14/2012 13:10	5/14/2012 15:30	2	140	Region 8 (Kanawha Charleston)	WV	Influenza	influenza A H3	Residents 14/90 (AR 16%) and Staff 17	Lab Confirmed	LTCF	person to person
118	5/14/2012 16:15	5/14/2012 17:15	1	60	Region 8 (Kanawha Charleston)	WV	Hand Foot and Mouth Disease	Undetermined	Attendees 5/18 (AR 28%)	Lab test not done	Day Care	person to person
119	5/22/2012 12:15	5/22/2012 13:30	1	75	Region 7 (SPHERE)	WV	Acute Respiratory Syndrome	Undetermined	Residents 14/109 (AR 13%)	Lab test negative or noncontributory	LTCF	Person to Person
120	6/1/2012 11:15	6/1/2012 11:45	0	30	Region 8 (Kanawha Charleston)	WV	Hand Foot and Mouth Disease	Undetermined	Attendees 5/30 (AR 17%)	Lab test not done	Day Care	Person to Person
121	6/4/2012 13:40	6/4/2012 13:50	0	10	Region 5 (PACT)	WV	Acute Respiratory Syndrome	Rhinovirus	Residents 13 and Staff 10	Lab Confirmed	LTCF	Person to Person
122	6/5/2012 9:30	6/5/2012 9:30	0	0	Region 1 (ROC)	WV	Clostridium Difficile Infection (CDI)	Clostridium difficile	Residents 4	Lab Confirmed	LTCF	Person to Person

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123	6/6/2012 10:10	6/6/2012 10:30	0	20	Region 8 (Kanawha Charleston)	WV	Hand Foot and Mouth Disease	Undetermined	Daycare Attendees 19/28 (AR 68%) Staff 1	Lab test not done	Day Care	Person to Person
124	6/7/2012 11:00	6/7/2012 12:10	1	70	Region 2 (BUNDLE)	WV	Multiple Clinical Presentations	<i>Serratia marcescens</i>	Patients 7	Lab Confirmed	Hospital	Undetermined
125	6/15/2012 9:10	6/15/2012 9:55	0	45	Region 8 (Kanawha Charleston)	WV	Hand Foot and Mouth Disease	Undetermined	Children 11/30 (AR 37%)	Lab test not done	Day Care	Person to Person
126	6/16/2012 12:00	6/16/2012 14:00	2	120	Region 4 (Northern Panhandle)	WV	Wound infection	MDR-Acinetobacter baumannii	Patients 4	Lab Confirmed	Rehabilitation Facility	Person to Person
129	7/2/2012 11:00	7/2/2012 13:30	2	150	Region 5 (PACT)	WV	Acute Gastroenteritis	Undetermined	Staff 6 and Patrons: 25	Lab test not done	Restaurant	Undetermined
131	7/10/2012 15:30	7/10/2012 15:42	0	12	Region 6 (Mid-Ohio Valley)	WV	Scabies	Undetermined	Resident 1 and Staff 3	Lab test not done	Group Home	Person to Person
132	7/12/2012 14:00	7/12/2012 23:50	9	590	Region 3 (Eastern Panhandle)	CD C	Salmonellosis	Salmonella enteritidis	WV 1 Nationwide 46	Lab Confirmed	Community	Point Source
133	7/19/2012 14:25	7/19/2012 15:05	1	40	Region 8 (Kanawha Charleston)	WV	Hand Foot and Mouth Disease	Undetermined	Daycare attendees 11	Lab test not done	Day Care	Person to Person
134	7/19/2012 15:45	7/19/2012 16:25	1	40	Region 8 (Kanawha Charleston)	WV	MRSA Skin and Soft Tissue infection	CA-Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	Daycare attendees 3/10 (AR 30%)	Lab Confirmed	Day Care	Person to Person
135	7/23/2012 16:15	7/23/2012 16:00	0	16	Region 1 (ROC)	WV	Multiple Clinical Presentations	MDR-Acinetobacter baumannii	Patients 21	Lab Confirmed	Hospital	person to person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
136	7/23/2012 16:15	7/23/2012 16:00	0	16	Region 1 (ROC)	WV	Multiple Clinical Presentations	MDR- <i>Acinetobacter baumannii</i>	Patients 18	Lab Confirmed	Hospital	person to person
137	7/30/2012 14:25	7/30/2012 14:25	0	0	Region 1 (ROC)	WV	Pertussis	<i>Bordetella pertussis</i>	Confirmed 8 and Probable 3	Lab Confirmed	Community	person to person
139	8/6/2012 11:45	8/6/2012 11:55	0	10	Region 2 (BUNDLE)	CD C	Influenza	Influenza H3N2v	Cases 3	Lab Confirmed	Animal Fair	Point Source
142	8/24/2012 9:45	8/24/2012 10:30	1	45	Region 4 (Northern Panhandle)	WV	Acute Gastroenteritis	Undetermined	Staff 4 and Patrons 7	Lab test not done	Restaurant	Probable Point Source
143	8/20/2012 13:50	8/20/2012 14:15	1	25	Region 6 (Mid-Ohio Valley)	WV	Scabies	Undetermined	Residents 25/50 (AR 50%)	Lab test not done	LTCF	person to person
144	8/17/2012 17:00	8/20/2012 9:30	64	3870	Region 4 (Northern Panhandle)	WV	Scabies	Undetermined	Residents 3	Lab test not done	Group Home	Person to Person
145	8/29/2012 11:00	8/29/2012 11:30	0	30	Region 1 (ROC)	WV	Hand Foot and Mouth Disease	Undetermined	Daycare Attendees 4	Lab test not done	Day Care	Person to Person
146	9/3/2012 15:00	9/4/2012 8:45	17	1065	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 18/116 (AR 16%) Staff: 7/150 (AR 5%)	Lab test negative or noncontributory	LTCF	Person to Person
147	9/6/2012 11:18	9/6/2012 11:45	0	27	Region 6 (Mid-Ohio Valley)	WV	Acute Respiratory Syndrome	Rhinovirus	Residents 28/54 (AR 52%)	Lab Confirmed	LTCF	Person to Person
148	9/7/2012 10:30	9/7/2012 11:43	1	73	Region 4 (Northern Panhandle)	WV	Acute Gastroenteritis	Undetermined	Residents 14 Staff 3	Lab Test not done	LTCF	person to person
149	9/8/2012 10:00	9/8/2012 9:30	2	31	Region 3 (Eastern Panhandle)	WV	Scabies	<i>Sarcoptes scabiei</i>	Residents 7	Lab Confirmed	LTCF	person to person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
150	9/14/2012 10:30	9/14/2012 10:48	0	18	Region 6 (Mid-Ohio Valley)	WV	Acute Respiratory Syndrome	Rhinovirus	Residents 30/66 (AR 45%) and Staff 3/75 (AR 4%)	Lab Confirmed	LTCF	Person to Person
151	9/17/2012 8:30	9/17/2012 9:30	1	60	Region 5 (PACT)	WV	Acute Respiratory Syndrome	Undetermined	Residents 17	Lab test not done	LTCF	person to person
152	9/10/2012 14:00	9/14/2012 13:00	95	570	Region 1 (ROC)	WV	Hand Foot and Mouth Disease	Undetermined	Daycare Attendees 17	Lab test not done	Day Care	person to person
153	9/24/2012 8:00	9/24/2012 8:45	0	45	Region 2 (BUNDLE)	WV	Pertussis	<i>Bordetella pertussis</i>	Confirmed Cases 3	Lab Confirmed	Community	person to person
155	9/24/2012 15:00	9/24/2012 15:49	0	49	Region 4 (Northern Panhandle)	WV	Pertussis	<i>Bordetella Pertussis</i>	Community 4 cases	Lab Confirmed	Community	person to person
156	9/26/2012 12:45	9/26/2012 13:06	1	21	Region 1 (ROC)	WV	Norovirus Gastroenteritis	Norovirus G1	Residents 18/115 (AR 7%) Staff 7/150 (AR 4.7%)	Lab Confirmed	LTCF	Person to Person
157	9/14/2012 15:15	9/14/2012 14:00	2	76	Region 5 (PACT)	CD C	Salmonellosis	<i>Salmonella pomona</i>	Cases 3 in WV and Nationally 347	Lab Confirmed	Community	Point Source
159	10/2/2012 15:30	10/2/2012 16:00	1	30	Region 1 (ROC)	WV	Streptococcus pharengitis	Group A streptococcus (GAS)	Daycare Attendee: 3/8 (AR 38%) and Staff: 4/5 (AR 80%).	Rapid test positive but not culture confirmed	Day Care	Person to Person
160	9/29/2012 11:10	9/29/2012 11:00	0	11	Region 6 (Mid-Ohio Valley)	CD C	Meningitis and Other Infections	Fungal Pathogens	Cases: 7 (Ongoing investigation)	Lab Confirmed	Outpatient Clinic	Point source
161	10/4/2012 8:15	10/4/2012 10:04	2	109	Region 5 (PACT)	WV	Varicella	Undetermined	Students 5	Lab test not done	School	Person to Person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
162	9/13/2012 15:00	10/3/2012 15:00	480	28800	Region 3 (Eastern Panhandle)	WV	Varicella	Undetermined	Students 9/207 (AR 4%)	Lab test not done	School	Person to Person
163	10/10/2012 15:00	10/12/2012 10:27	43	2607	Region 7 (SPHERE)	WV	Acute Respiratory Syndrome	Undetermined	Residents 5/105 (AR 5%)	Lab test not done	LTCF	Person to Person
164	10/10/2012 15:00	10/12/2012 10:27	43	2607	Region 7 (SPHERE)	WV	Acute Gastroenteritis	Undetermined	Residents 5/105 (AR 5%)	Lab test not done	LTCF	Person to Person
165	10/9/2012 15:00	10/12/2012 11:11	68	4091	Region 1 (ROC)	WV	Acute Respiratory Syndrome	Undetermined	Undetermined	Lab test not done	LTCF	Person to Person
166	10/15/2012 14:45	10/15/2012 14:10	0	36	Region 1 (ROC)	WV	Campylobacter Gastroenteritis	Campylobacter	3 Cases	Lab Confirmed	Community	Probable Point Source
167	10/15/2012 11:45	10/15/2012 11:51	0	6	Region 1 (ROC)	WV	Pertussis	<i>Bordetella Pertussis</i>	2 cases	Lab Confirmed	Outpatient Clinic	Person to Person
168	10/16/2012 12:00	10/16/2012 12:20	0	20	Region 6 (Mid-Ohio Valley)	WV	Multiple Clinical Diagnoses	Undetermined	6 cases	Lab test not done	Sports Team	Person to Person
171	11/13/2012 12:51	11/13/2012 15:00	3	129	Region 2 (BUNDLE)	WV	Acute Gastroenteritis	Undetermined	Attendees 24 and Staff 1	Lab test not done	Church Gathering	Probable Point Source
172	11/19/2012 15:15	11/19/2012 15:37	0	22	Region 8 (Kanawha Charleston)	WV	Acute Gastroenteritis	Undetermined	Residents 10/54 (AR 18.5%)	Lab test not done	LTCF	Person to Person
173	11/19/2012 15:15	11/19/2012 15:37	0	22	Region 8 (Kanawha Charleston)	WV	Acute Respiratory Syndrome	Undetermined	Residents 8/54 (AR 15%)	Lab test not done	LTCF	Person to Person
174	11/27/2012 11:00	11/27/2012 10:00	2	61	Region 3 (Eastern Panhandle)	WV	Varicella	Undetermined	Students 5	Lab test not done	School	Person to Person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
175	11/29/20 12 13:20	11/29/20 12 13:25	0	5	Region 1 (ROC)	WV	Acute Gastroenteritis	Undetermined	Residents 24	Lab test negative or noncontributory	LTCF	Person to Person
176	11/29/20 12 13:45	11/29/20 12 14:02	1	17	Region 6 (Mid-Ohio Valley)	WV	Acute Respiratory Syndrome	Undetermined	Residents 29/63 (46%)	Lab test negative or noncontributory	LTCF	Person to Person
177	11/30/20 12 12:00	11/30/20 12 13:17	1	77	Region 6 (Mid-Ohio Valley)	WV	Mumps	Undetermined	1 Probable Case	Lab test negative or noncontributory	School	Person to person
179	12/3/201 2 15:40	12/3/201 2 16:30	1	50	Region 8 (Kanawha Charleston)	WV	Influenza	Influenza A H3	Daycare Attendees 13/158 (AR 8.2%) and Staff 1	Lab Confirmed	Day Care	Person to Person
180	12/4/201 2 16:00	12/4/201 2 17:44	1	104	Region 8 (Kanawha Charleston)	WV	Scabies	Undetermined	Residents 3	Lab test not done	LTCF	Person to Person
181	12/5/201 2 13:30	12/5/201 2 13:37	0	7	Region 4 (Northern Panhandle)	WV	Influenza	Influenza A H3	Highest Absentee Rate: 17%	Lab Confirmed	School	Person to Person
182	12/11/20 12 9:05	12/11/20 12 9:30	0	25	Region 1 (ROC)	WV	Influenza	Influenza A H3	Highest Absentee Rate: 18.9%	Lab Confirmed	School	Person to person
183	12/11/20 12 14:40	12/11/20 12 15:00	1	20	Region 1 (ROC)	WV	Pneumonia	Undetermined	Residents 3/13 (AR 23%)	Lab test not done	LTCF	Person to person
184	12/12/20 12 12:30	12/12/20 12 13:45	1	75	Region 1 (ROC)	WV	Influenza	Influenza A H3	Residents 3/84 (AR 3.6%)	Lab Confirmed	LTCF	Person to Person
186	12/17/20 12 15:00	12/17/20 12 15:51	0	51	Region 3 (Eastern Panhandle)	WV	Influenza	Influenza A & B	Highest absentee rate 23%	Rapid test positive but not culture confirmed	School	Person to Person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
187	12/18/20 12 11:00	12/18/20 12 11:30	0	30	Region 6 (Mid-Ohio Valley)	WV	Influenza-like illness	Undetermined	Highest absentee rate 20%	Lab test not done	School	Person to Person
190	12/19/20 12 13:19	12/19/20 12 12:52	2	28	Region 8 (Kanawha Charleston)	WV	Influenza	Influenza A H3	Residents 16/55 (AR 29%)	Lab Confirmed	LTCF	Person to Person
192	12/21/20 12 12:20	12/21/20 12 12:30	0	10	Region 2 (BUNDLE)	WV	Multiple Clinical Presentations	MDR- <i>Acinetobacter baumannii</i>	10 cases	Lab Confirmed	Hospital	Person to Person
193	12/26/20 12 13:45	12/26/20 12 13:10	0	36	Region 3 (Eastern Panhandle)	WV	Acute Gastroenteritis	Undetermined	Attendees 15/18 (AR 83%)	Lab test not done	Family Gathering	Point Source
194	12/26/20 12 17:00	12/26/20 12 17:20	0	20	Region 8 (Kanawha Charleston)	WV	Influenza	Influenza A H3	Residents 36/111 (AR 32%)	Lab Confirmed	LTCF	Person to Person
195	12/17/20 12 11:00	12/18/20 12 11:30	24	147 0	Region 6 (Mid-Ohio Valley)	WV	Influenza	Influenza A H3	Residents 29/60 (AR 48%)	Lab Confirmed	LTCF	Person to Person
196	12/27/20 12 11:00	12/27/20 12 11:30	0	30	Region 2 (BUNDLE)	WV	Influenza	Influenza A	Residents 17/150 (AR 11%) Staff 1	Rapid test positive but not culture confirmed	LTCF	Person to Person
197	12/27/20 12 14:00	12/27/20 12 14:20	0	20	Region 1 (ROC)	WV	Influenza	Influenza A H3	Residents 22/120 (18%), Staff 3	Lab Confirmed	LTCF	Person to Person
198	12/27/20 12 14:00	12/27/20 12 14:25	0	25	Region 1 (ROC)	WV	Influenza	Influenza A	Residents 1/13 (AR 8%) Staff 1	Rapid test positive but not culture confirmed	LTCF	Person to Person
200	12/28/20 12 9:00	12/28/20 12 22:48	13	828	Region 4 (Northern Panhandle)	WV	Influenza	Influenza A	Residents 7/48 (AR 15%)	Lab Confirmed	LTCF	person to person

Outbreak Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in hours	Elapsed Time in Minutes	Region	Jurisdiction	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission setting	Modes of transmission or source of illness
201	12/28/20 12 9:00	12/28/20 12 9:45	0	45	Region 2 (BUNDLE)	WV	Influenza	Influenza	Residents 4/146 (AR 3%)	Rapid test positive but not culture confirmed	LTCF	Person to Person
202	12/28/20 12 14:45	12/28/20 12 15:15	1	30	Region 8 (Kanawha Charleston)	WV	Acute Respiratory Syndrome	Undetermined	Residents 5	Lab test not done	LTCF	person to person
203	12/29/20 12 12:00	12/29/20 12 12:35	0	35	Region 1 (ROC)	WV	Influenza	Influenza B	Residents 12/60 (AR 20%) and 2 staff	Lab Confirmed	LTCF	Person to Person