

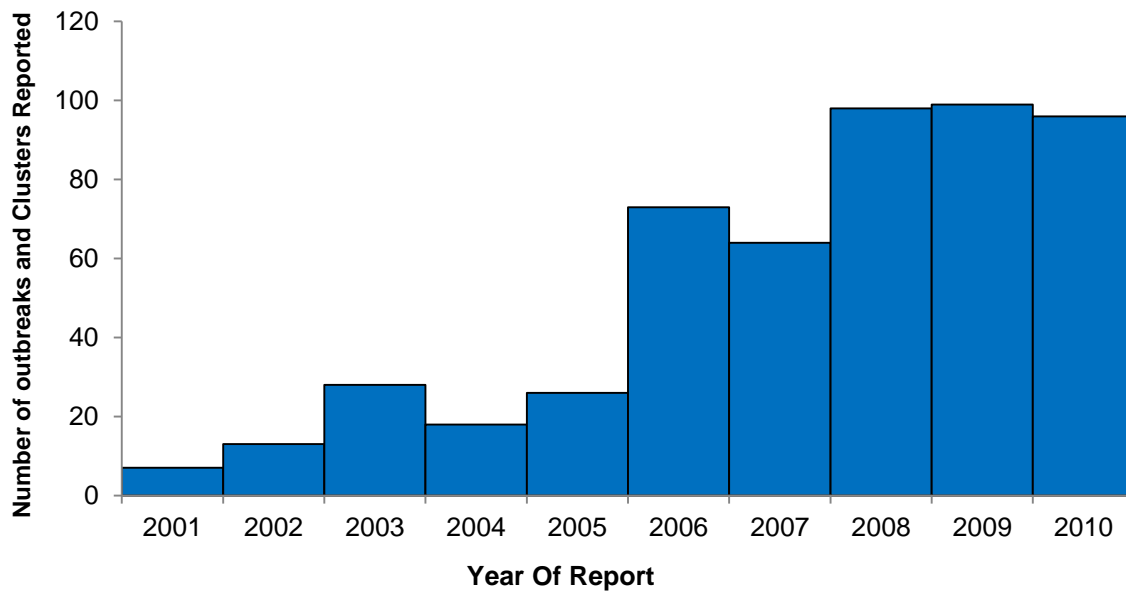
2010 Final Outbreak Report State of West Virginia

Introduction:

In 2010, a total of 124 outbreaks were identified and reported to local health departments. Of these reports, 96 (77.4%) were confirmed as outbreaks or clusters of disease (Appendix). Local health departments investigate and report outbreaks with assistance from their regional epidemiologist and the Bureau for Public Health. 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 2010. In 2001, 7 confirmed outbreaks were reported. In 2010, 96 confirmed outbreaks were reported, representing a 13-fold increase (Figure 1).

**Figure 1. Confirmed Outbreaks or clusters,
West Virginia, 2001 - 2010 (n=522)**



Confirmed Outbreaks:

In 2010, 95 (99%) confirmed outbreaks were limited to West Virginia residents, and 1 (1%) outbreak involved residents of other states. The most common type of outbreak involved enteric illness, followed by outbreaks of rash illness (Table 1)

Table 1. Types of Outbreaks Reported in West Virginia, 2010

Type of Outbreaks	Number of Outbreaks	Percent
Enteric	35	36.5%
Rash	33	34.3%
Respiratory	26	27.1%
Other	2	2.1%
Total	96	100%

In 2010 28 (51%) counties reported outbreaks, including multi-county outbreaks (Table 2). The highest number of outbreaks (21) was reported from Kanawha County followed by Mercer County with 13 outbreaks (Figure 2).

Figure 2. Counties Reporting Outbreaks / Outbreak-Related Cases, West Virginia, 2010 (N- 28)

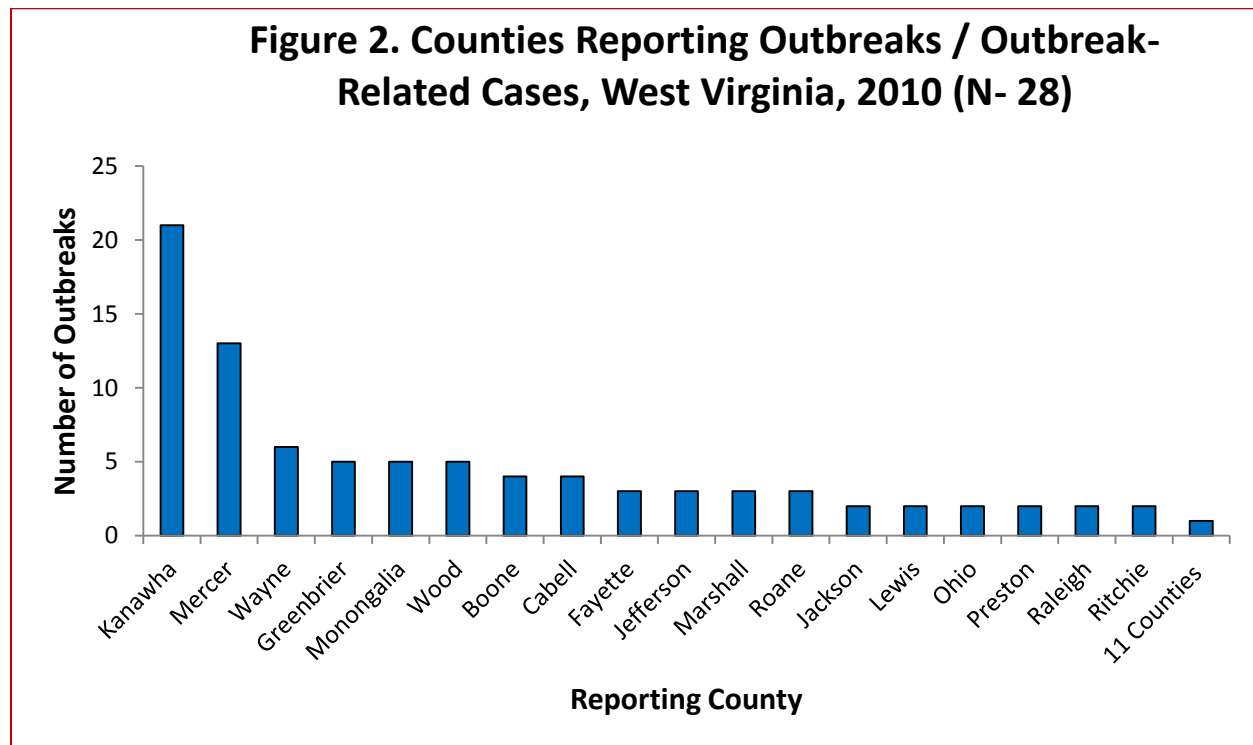


Table 2. Counties Reporting Outbreaks and/or Outbreak-Related Cases (Includes Multi-County Outbreaks) West Virginia, 2010

Counties with Cases	Number of Outbreaks
Boone	4
Braxton	1
Brooke	1
Cabell	4
Fayette	3
Greenbrier	5
Harrison	1
Jackson	2
Jefferson	3
Kanawha	21
Lewis	2
Barbour	1
Marshall	3
Mercer	13
Mingo	1
Monongalia	6
Monroe	1
Ohio	2
Pleasants	1
Preston	2
Putnam	1
Raleigh	2
Randolph	1
Ritchie	2
Roane	3
Wayne	6
Webster	1
Wood	5

Outbreaks of enteric illness were the most common type of outbreak in 2010, accounting for 36.5% of all outbreaks.

A total of 35 enteric outbreaks were reported by 16 (29%) counties. One enteric illness outbreak was reported in West Virginia as part of a multi-state outbreak. The Centers for Disease Control and Prevention (CDC) and other states were the lead investigators in this outbreak. The highest number (22) of enteric disease outbreaks were reported from healthcare facilities (Table3).

Table 3. Outbreaks of Enteric Disease by Transmission Settings, West Virginia, 2010

Transmission Settings	Number of Outbreaks	Percent
Healthcare Facilities	22	62.8%
Schools	4	11.4%
Communities	3	8.6%
Households	2	5.6%
Banquet	1	2.9%
Basketball tournament	1	2.9%
Restaurant	1	2.9%
Schools / Community	1	2.9%
Total	35	100%

Norovirus and acute gastroenteritis outbreaks were the most common types of enteric disease outbreaks, accounting for 28 (80%) enteric outbreaks (Table 4). 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.

Table 4. Outbreaks of Enteric Disease by Etiologic Agent, West Virginia, 2010

Etiologic Agent	Number of Outbreaks	Percent
Norovirus	16	45.7%
Acute Gastroenteritis (undetermined etiology)	12	34.3%
<i>Salmonella</i> Species	3	8.6%
Hepatitis A	2	5.7%
<i>Bacillus Cereus</i>	1	2.9%
<i>Shigella Sonnei</i>	1	5.7%
Total	35	100%

Among the 12 outbreaks characterized as acute gastroenteritis, laboratory tests were negative or non contributory in 5 outbreaks and not done in 7 outbreaks. All norovirus outbreaks were confirmed by PCR; 11 were norovirus genotype II, 3 were norovirus genotype I, 1 was combined norovirus genotype I and II, and 1 was norovirus with undetermined genotype.

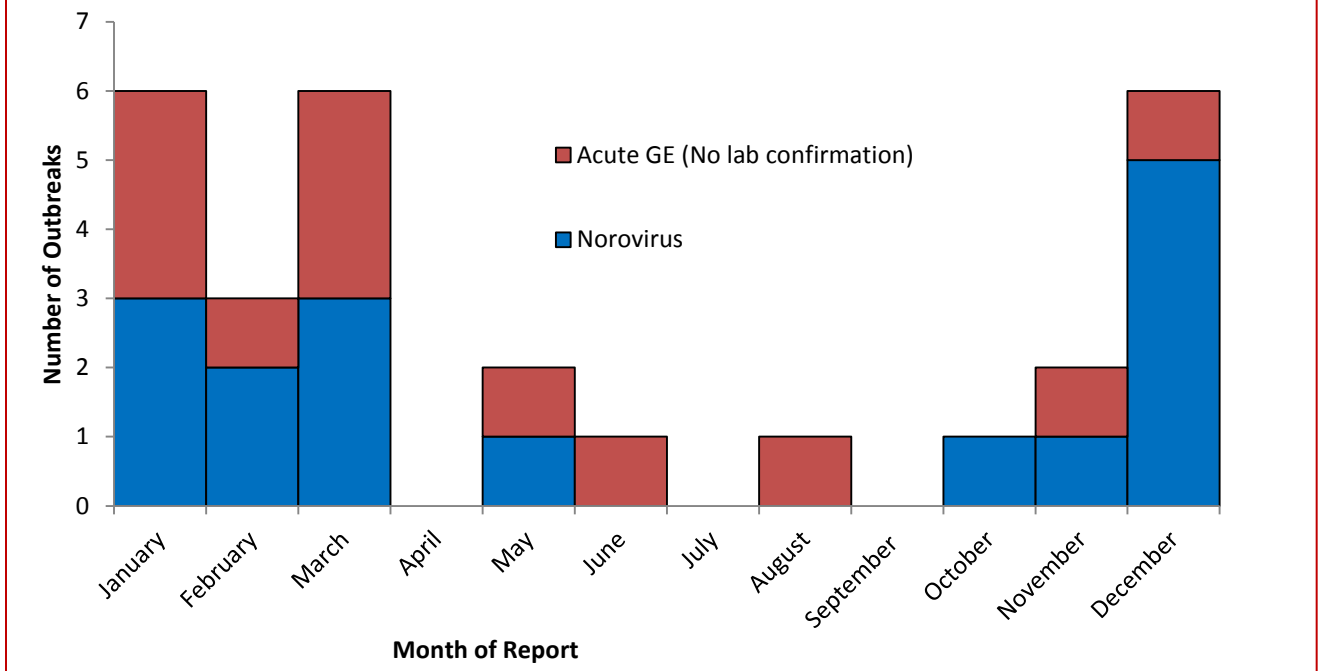
Most enteric outbreaks 26 (74.3%) were due to person to person transmission (Table 5).

Table 5. Outbreaks of Enteric Disease by Mode of Transmission, West Virginia, 2010

Modes of Transmission or Source of Illness	Number of Outbreaks	Percent
Person to Person	26	74.3%
Foodborne	4	11.4%
Point source and secondary Person to Person transmission	3	8.6%
Likely Point Source	2	5.7%
Total	35	100%

Outbreaks of acute gastroenteritis and norovirus exhibit similar seasonality and follow a familiar pattern of norovirus transmission in the winter months (Figure 2).

Figure 2. Outbreaks of Acute Gastroenteritis by Type, and Month of Report, West Virginia, 2010 (N=28)



There were 3 enteric outbreaks caused by *Salmonella* species. The first of these outbreaks was reported in January, 2010 when 6 members of a family of 10 from 3 households developed symptoms of salmonellosis after a dinner party. Three family members tested positive for *Salmonella* serotype Enteritidis. A foodborne source was postulated in this outbreak. However, an exact source could not be determined.

The second outbreak was also reported in January, 2010 when a West Virginia resident was diagnosed with salmonellosis as part of a multi-state outbreak of *Salmonella* serotype Montevideo. The outbreak affected 272 US residents and was traced to salami products containing contaminated imported black and red pepper.

The third outbreak occurred in March, 2010 when 7 laboratory confirmed cases of *Salmonella* serotype Enteritidis were identified. Further investigation identified additional cases for a total of 18 laboratory confirmed and 4 probable cases. A probable case was defined as a symptomatic person with an epidemiologic link to a laboratory confirmed case. Since *Salmonella* serotype Enteritidis is a very common serotype, standard pulse field gel electrophoresis (PFGE) testing was not sufficient to associate the outbreak cases. A total of 11 isolates were sent to the CDC laboratory for multi-locus variable-number tandem repeat analysis (MLVA) testing. The analysis, conducted by the WV Office of Laboratory Services (OLS) and CDC, confirmed that the isolates of *Salmonella* serotype Enteritidis obtained from the 11 cases were identical. This indicated that the cases were likely exposed to the same source of infection. Epidemiologic analysis associated illness with eating at multiple locations of a single chain restaurant.

Laboratory studies also concluded that the *Salmonella* serotype Enteritidis that was the cause of this outbreak was identical to the *Salmonella* serotype Enteritidis isolated during the investigation of a multi-county outbreak in June 2009, which was found to be associated with multiple locations of the same chain restaurant. Since epidemiologic and laboratory investigation linked the two outbreaks to several locations of the same chain restaurant, the BPH and LHD discussed the findings of this investigation and the recommendations with this restaurant corporation. The corporation planned to adopt the recommended changes in their food purchasing and handling practices to prevent similar outbreaks in the future.

Another foodborne outbreak was reported in August, 2010 when 10 family members were diagnosed with acute gastroenteritis after consuming pizza from a local restaurant. Laboratory testing of the patients was negative. Testing of the remaining pizza at OLS revealed contamination with *Bacillus cereus*. The LHD communicated the findings of the investigation and the recommendations to the restaurant.

There were two outbreaks of hepatitis A reported in 2010. The first one was reported in October when two family members were diagnosed with hepatitis A. An investigation determined that these cases were epidemiologically linked to an outbreak of hepatitis A in a daycare in the state of Kentucky. An asymptomatic infant in the household attended the daycare and likely transmitted the infection to other family members. Hepatitis A infection is asymptomatic among children younger than 6 years of age in 70% of cases.

The second outbreak was also reported in October among members of a community. The epidemiologic investigation identified 11 cases of hepatitis A with disease onset dates ranging from 9/5/2010 to 12/15/2010. Although West Virginia's reportable disease rule mandates reporting of hepatitis A cases within 24 hours of identification, the 2 cases with the earliest onset dates in September were retrospectively identified in October after the outbreak report. The mode of transmission in this outbreak appeared to be person-to-person with the infection transmitted among friends/associates and with secondary spread to family members. In an effort to control the outbreak, the local health department issued press releases, provided education and outreach to community physicians, and conducted community wide vaccination clinics and education in the targeted areas.

An outbreak of *Shigella sonnei* was reported among children in multiple schools with secondary spread to the community. A total of 105 cases were identified (33 confirmed and 72 probable cases). However, since shigellosis is asymptomatic in 95% of cases the actual number of cases in this outbreak was probably several times higher than that reported. *Shigella* is mainly transmitted from person-to-person via fecal-oral route. Occasionally *Shigella* may be spread by physical contact or ingestion of contaminated food and/or water. Because few bacteria are required to cause disease, shigellosis can propagate and persist in settings with insufficient hygiene practices. This makes

controlling shigellosis outbreaks among certain populations a significant challenge. This outbreak continued for almost 11 weeks. The LHD in collaboration with BPH and CDC implemented strict measures to control this outbreak.

Outbreaks of rash illness were the second most common outbreak type in 2010 accounting for 33 (34.4%) outbreaks and reported by 17 counties.

The most common type of rash illness outbreaks reported was varicella (chickenpox) (20) followed by scabies (8), Hand, Foot and Mouth Disease (2), Methicillin-resistant *Staphylococcus aureus* (MRSA) skin infection (2) and folliculitis (1) (Table 6).

Table 6. Outbreaks of Rash Illness by Clinical Syndrom / Etiologic Agent, West Virginia, 2010

Clinical Syndrome / Etiologic Agent	Number of outbreaks	Percent
Varicella (Chichenpox)	20	60.6%
Scabies	8	24.2%
Hand, Foot and Mouth Disease	2	6.1%
Skin infection - MRSA	2	6.1%
Rash / Folliculitis	1	3.0%
Total	33	100%

There was a ten-fold increase in the number of varicella (chickenpox) outbreaks from 2 in 2009 to 20 in 2010. This marked increase in varicella outbreaks can be attributed to the varicella vaccine effectiveness project, which hired two full-time staff, offered free laboratory testing, implemented active varicella surveillance in WV public schools and performed an education campaign that targeted healthcare providers, school nurses, school-based health centers and local health departments regarding identification and reporting of varicella, especially atypical and breakthrough disease. There was also a change in varicella outbreak definition for schools, which lowered the total number of cases required to identify an outbreak within one incubation period from 5 to 3 cases. Nineteen outbreaks of varicella were reported from schools and one was reported from a community. Among varicella outbreaks 7 were laboratory confirmed, 3 had negative or non-contributory laboratory results, and 10 did not have laboratory testing.

Eight outbreaks of scabies were reported in 2010 (Table 7). Among scabies outbreaks, 2 were laboratory confirmed, and 6 did not have laboratory testing but were confirmed by clinical diagnosis. Five outbreaks of scabies were reported from Kanawha county and one from Boone, Marshall, and Ritchie counties.

Table 7. Outbreaks of Scabies by reporting source, West Virginia, 2010

Transmission Settings	Number of outbreaks	Percent
LTCFs	5	62.5%
Jail	1	12.5%
School	1	12.5%
Women Shelter	1	12.5%
Total	8	100%

Two outbreaks of MRSA-skin infection were reported in 2010. One was reported from an athletic team and the other was reported from a school.

Two outbreaks of Hand, Foot and Mouth Disease (HFMD) were reported from daycare facilities. 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 was also one outbreak of waterborne skin infection reported from a camp. There was no laboratory confirmation. However, the clinical presentation was consistent with waterborne folliculitis.

Outbreaks of respiratory illness were the third most common type of disease outbreak in 2010, accounting for 26 (27%) confirmed outbreaks (Table 8). Respiratory illness outbreaks were reported by 14 (25%) counties. In 2009, outbreaks of respiratory illness represented the most common type of outbreak reported in West Virginia because of the emergence of (2009) influenza A (H1N1) virus that peaked in October, 2009. This peak was followed by a marked reduction in influenza activity during 2010.

Table 8. Respiratory Outbreaks by Clinical Syndrome, West Virginia, 2010

Clinical Syndrome	Number of Outbreaks	Percent
Upper Respiratory Illness	16	61.6%
Pertussis (Whooping Cough)	5	19.2%
<i>Streptococcus</i> Pharyngitis	3	11.6%
Influenza-Like Illness	1	3.8%
Upper Respiratory Illness / Pneumonia	1	3.8%
Total	26	100%

Upper respiratory illness (URI) represented the majority of respiratory outbreaks. Sixteen outbreaks were reported from healthcare facilities (see Healthcare-Associated Outbreaks section) and one outbreak was reported from a school.

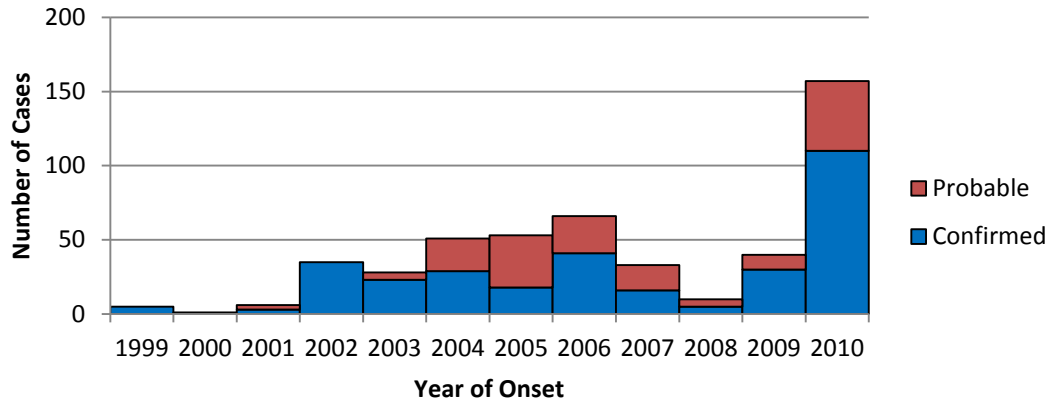
There was one outbreak of influenza-like illness reported from a school. Influenza-like illness is defined as a fever of a 100 degrees Fahrenheit or higher, plus cough, and/or sore throat in the absence of a known cause.

There were 3 (11.6%) outbreaks of *Streptococcus* pharyngitis reported in 2010. *streptococcus* pharyngitis is caused by group A *Streptococcus* (GAS) and presents clinically with fever, pharyngitis and sore throat. Two outbreaks were reported from schools and the one outbreak was reported from a daycare. All three outbreaks were rapid test positive but not culture confirmed.

No outbreaks of seasonal influenza, or 2009 influenza A (H1N1) were reported in 2010.

There were 5 outbreaks of pertussis (whooping cough) reported in 2010. Four outbreaks were reported among communities and the remaining outbreak was reported among daycare attendees. There were no pertussis-related deaths in WV in 2010. Pertussis is an endemic disease in West Virginia and the U.S. The disease displays a cyclical pattern and causes periodic outbreaks every 3 to 5 years. The incidence of sporadic cases of pertussis has increased dramatically in West Virginia during 2010 (figure 3). 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.

Figure 3. Confirmed and Probable cases of Pertussis by Year of Onset, West Virginia, 1999-2010



There were 2 (2.1%) recognized outbreaks in 2010 that were categorized as “other” Both were outbreaks of conjunctivitis, and were reported from schools. Laboratory testing was negative or non-contributory in one outbreak and not done in the other.

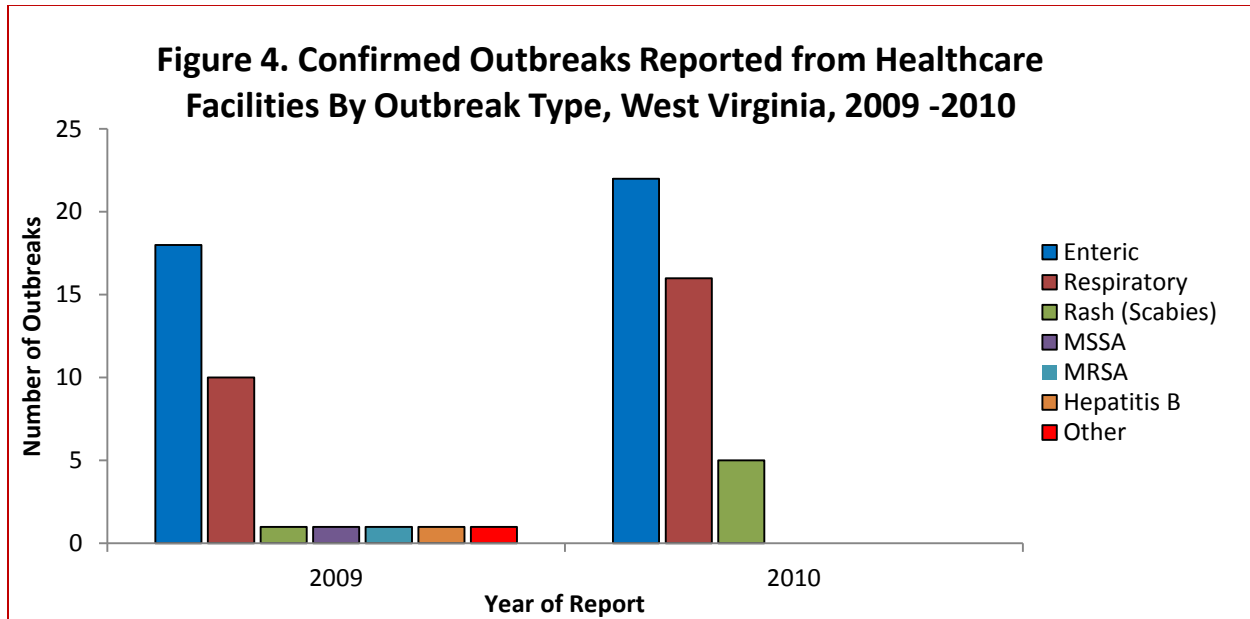
In 2010, 27 (28%) outbreaks were vaccine-preventable. The number of vaccine-preventable disease outbreaks decreased from 38 in 2009 to 26 in 2010. This reduction can be explained by the decrease in the influenza activities in 2010 compared to 2009 when the emergence of (2009) influenza A (H1N1) occurred. The most common vaccine-preventable disease outbreaks reported in 2010 were due to varicella (chickenpox) (20), pertussis (5), and finally hepatitis A (2) (Table 9).

Table 9. Vaccine Preventable Disease Outbreaks by Etiologic Agent or Clinical Syndrome, West Virginia, 2010

Clinical Diagnosis	Number of Outbreaks	Percent
Varicella (Chickenpox)	20	74.1%
Pertussis (Whooping Cough)	5	18.5%
Hepatitis A	2	7.4%
Total	27	100%

Healthcare-Associated Outbreaks:

In 2010, 43 (45%) outbreaks were reported from healthcare facilities. Forty-one (95%) of these outbreaks were reported from long-term care facilities, and the remaining 2 (5%) were reported from hospitals. The number of confirmed healthcare-associated outbreaks (HAOs) increased from 33 in 2009 to 43 in 2010. Enteric outbreaks comprised the majority of HAOs in both 2009 and 2010, followed by respiratory disease outbreaks (Figure 4)



In 2010, the majority (51%) of healthcare associated outbreaks were enteric disease outbreaks followed by respiratory disease (37%) and rash illness (11.6%) (Table 10).

Table 10. Healthcare-Associated Outbreaks by Type of Outbreak, West Virginia, 2010

Type of outbreak	Number of Outbreaks	Percent
Enteric	22	51.2%
Respiratory	16	37.2%
Rash	5	11.6%
Total	43	100%

Twenty one enteric disease outbreaks were reported from LTCFs and the remaining outbreak was reported from a hospital. Eleven outbreaks were laboratory-confirmed as norovirus. Laboratory testing was negative or non-contributory in 4 outbreaks and was not done in the remaining 6 outbreaks (Table 11)

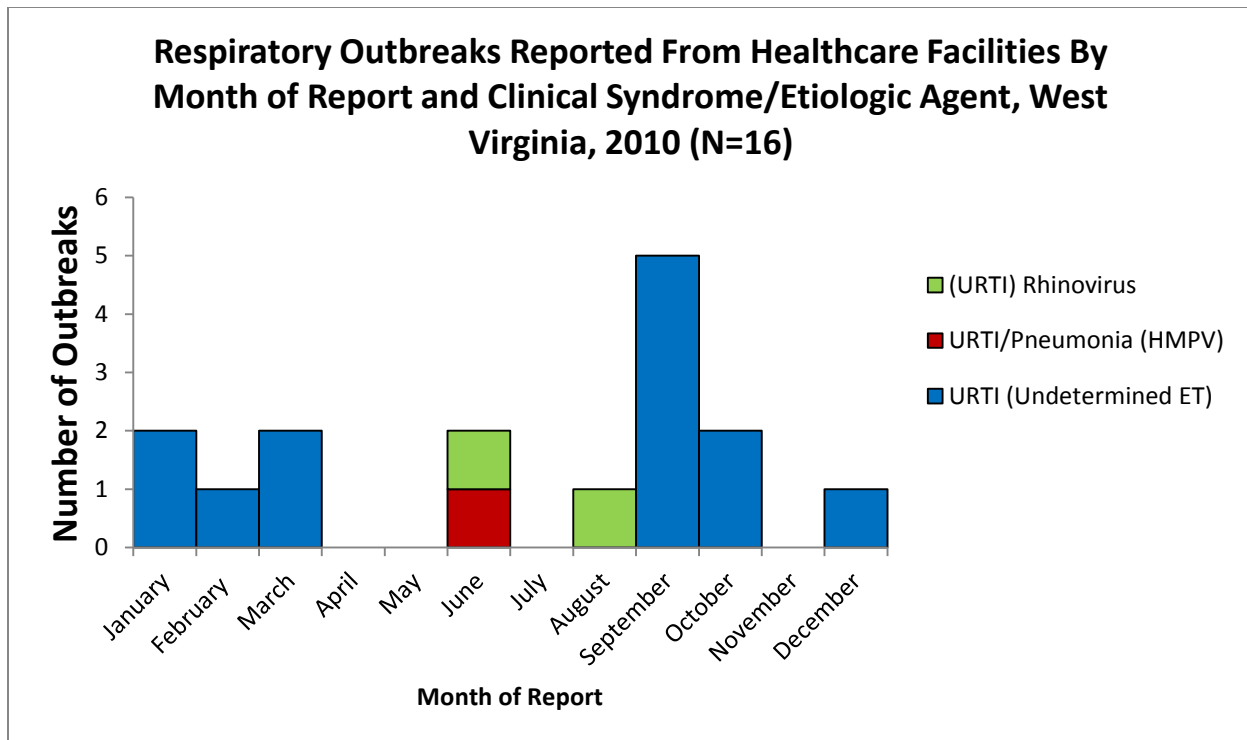
Table 11. Enteric Outbreaks reported from Healthcare Facilities by Etiologic Agent, West Virginia, 2010

Etiologic Agent	Number of Outbreaks	Percent
Norovirus Genotype II	8	36.4%
Undetermined (Lab testing not done)	6	27.0%
Undetermined (Lab testing negative or non contributory)	4	18.0%
Norovirus Genotype I	2	9.1%
Norovirus (no typing)	1	4.5%
Norovirus Genotype I & II	1	4.5%
Total	22	100%

Among HAOs caused by enteric disease, the mode of transmission was person-to-person in 19 outbreaks, likely point source in 2 outbreaks and point source with secondary person-to-person transmission in 1 outbreak.

Respiratory outbreaks were the second most common HAO with 16 reported in 2010. Fifteen were reported from long-term care facilities and one was reported from a hospital. All reported outbreaks were due to upper respiratory illnesses and one of them was complicated by pneumonia. There were no reported HAOs of influenza or influenza-like illness.

Upper respiratory illness is defined as new onset of at least two of the following symptoms: runny nose or sneezing, stuffy nose / congestion, sore throat / hoarseness / difficulty swallowing, dry cough, and/or cervical lymphadenopathy. Among upper respiratory illness HAOs, laboratory testing was negative or non-contributory in 8 outbreaks, not done in the 5 outbreaks, and confirmed as rhinovirus (common cold) in the remaining 2 outbreaks. Rhinovirus was identified by using an advanced PCR assay at CDC. Human metapneumovirus caused an outbreak of URI/pneumonia at one LTCF. This outbreak had an attack rate of 47% and death rate of 1%. Several cases were complicated by pneumonia. Human metapneumovirus was laboratory confirmed at CDC.



Five HAOs were rash illnesses. All confirmed rash illness outbreaks were caused by scabies and reported from LTCFs. Two outbreaks were laboratory confirmed and 3 were confirmed by clinical diagnosis. Scabies outbreaks are not uncommon in institutional settings, such as LTCFs and hospitals. Early identification, implementation of isolation and control measures, and the timely treatment and prophylaxis of patients and exposed is essential to control scabies outbreaks

Outbreak Reporting Time

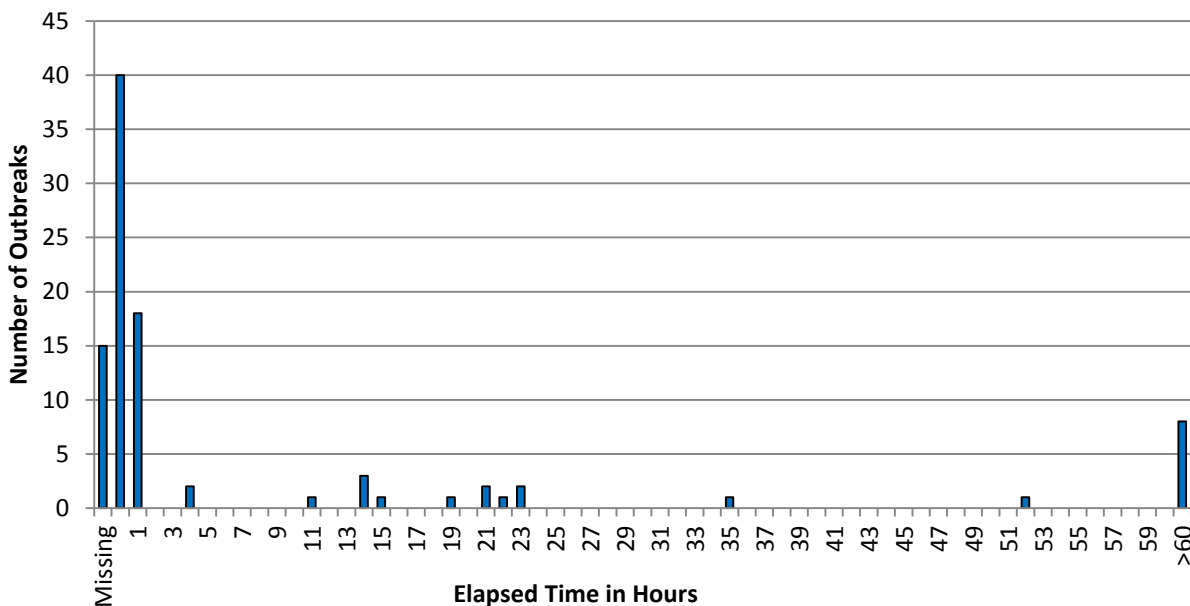
In West Virginia, outbreaks are immediately reportable to the local health department. According to infectious disease rules and regulations and as a condition of receiving threat preparedness funding local health departments are required to report immediately reportable conditions to the Bureau for Public Health 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 the Division of Infectious Disease Epidemiology are recorded on a standard intake form so that elapsed reporting time can be calculated.

For 2010, 15 (15.6%) outbreaks were missing the date or time of report to the local health department or the state health department or both (Figure 4). Of the remaining 81 (84.4%) outbreaks, a mean 35.8 hours and a median of 1 hour 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. 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 864 hours. Of the 81 (84%) outbreaks where date of notification was known for the state and local health department, same-day notification occurred for 71 (88%) outbreaks.

Figure : Elapsed Time for Reporting Outbreaks Between State and Local Health Departments, West Virginia, 2010 (N=96)



Conclusions and Recommendations

Although outbreaks always represent challenges in investigation and implementation of appropriate control measures, they also provide opportunities for improvement. Over the last few years, there has been marked improvement in outbreak recognition and reporting in West Virginia. However, opportunities still exist for continued improvements and can be highlighted as follows:

1. Outbreaks are immediately notifiable in West Virginia and should be reported to the Bureau for Public Health 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 on critical health issues.

2. The role of laboratory testing is crucial in outbreak management. There is a great need for using advanced technology in laboratory testing to improve the early detection and management of outbreaks. Timely collection of specimens facilitates diagnosis and institution of control measures. Coordination and timely communication between epidemiology and laboratory staff is essential in outbreak management and control.
3. The use of standard outbreak protocols has tremendous impact in improving outbreak investigation and control. The Division of Infectious Disease Epidemiology (DIDE) has developed several outbreak toolkits for the most commonly encountered outbreaks, such as influenza, pneumonia, norovirus, and scabies. 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.wvidep.org
4. DIDE continues to improve feedback of information on outbreaks and outbreak investigation during 2011 and beyond. Since January 2011, DIDE has been releasing a monthly report on outbreaks to provide details on reported outbreaks in the state to public health partners and healthcare providers.
5. DIDE is planning to hold an evaluation of foodborne outbreak response at the state and regional levels. This evaluation will assist in identifying areas of strength and opportunities for improvement according to the Council to Improve Foodborne Outbreak Response (CIFOR) guidelines.
6. 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.
7. DIDE will continue to participate in electronic reporting of all enteric outbreaks in the National Outbreak Reporting System (NORS).
8. DIDE is committed to provide regular training on outbreak management to the state, regional and local public health personnel.
9. Outbreak surveillance in the last few years indicates that outbreaks in long-term care facilities are increasing and are occasionally severe and even fatal. Identification and management of outbreaks in LTCFs can be challenging for the facility staff, healthcare providers and public health because of the following obstacles:
 - Lack of dedicated Infection Preventionist (IPs) in each facility. IPs usually have multiple responsibilities in addition to infection control.
 - Limited resources for the (IPs) particularly in training and education.

- Staffing issues, such as rapid turn-over, occasional understaffing, and lack of regular training in infection control.
- Scarce on-site physician availability.
- Excessive use of antibiotics
- Low technology setting, limited diagnostic tools, and scarce resources
- Low immunization rates especially among staff
- Challenges in balancing infection control measures and psychosocial needs of the residents.
- Inconsistent utilization of existing surveillance system

10. In order to improve infection control and outbreak identification, reporting and management in LTCFs. The WV healthcare-associated infections (HAIs) plan for 2011 proposes a LTCFs Working Group as a subcommittee of the state HAIs Advisory Group. The Working Group will initially help maintain communication among stakeholders and assess the infection prevention and control needs of LTCFs. The following strategies will be presented to the LTCFs Working Group for discussion:

- Establish supporting infrastructures for LTCFs IPs
- Identify Educational and training needs of LTCFs IPs
- Educate physicians regarding utilization of antibiotics and infection control in LTCFs
- Encourage LTCFs to develop and update infection control policies and procedures according to SHEA-APIC recommendations.
- Provide regular training on infection prevention in LTCFs to the staff at the state, regional and local levels.

11. Although there were no outbreaks reported from ambulatory care centers in 2010, there were 2 major HAI outbreaks reported from ambulatory clinics in 2009. Therefore, DIDE will offer a statewide training on infection prevention for ambulatory surgery centers (ASC) provided by APIC to ASC staff and public health personnel.

12. The WV 2011 HAIs plan aims to improve identification and management of HAI outbreaks through the following strategies:

- Presenting the findings and recommendations from this report to the Advisory Group as well as WV APIC section as the basis for annual needs assessment.
- Collaborating with representatives of the Office of Health Facility Licensure and Certification, the Board of Medicine, the Board of Osteopathy, the Board of Dental Examiners, Board of Pharmacy, and the Board of Examiners for Registered Professional Nurses to formulate an agreement to coordinate investigation of outbreaks and infection control breaches.
- Provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs.

- Planning for revision of the reportable disease rule, during 2012, to include healthcare associated outbreaks in the list of reportable conditions.
- Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments

Appendix Summary Outbreak Tables for 2010, West Virginia

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
1	Missing	1/4/2010 12:00	Missing	WV	Kanawha	Acute Gastroenteritis	Norovirus Genotype II	53/172 residents (AR 31%) and 55/125 staff (AR 44%)	Lab Confirmed	Nursing Home	Person to Person
2	1/11/2010	1/11/2010 14:45	885	WV	Pleasants	Acute Gastroenteritis	Norovirus Genotype II	41/64 residents (AR 64%) and 14/80 staff (AR 18%)	Lab Confirmed	Nursing Home	Person to Person
3	Missing	Missing	Missing	WV	Kanawha	Acute Gastroenteritis	Undetermined	47 Residents	Lab test not done	Nursing Home	Person to Person
4	Missing	Missing	Missing	WV	Monroe	Upper Respiratory Illness	Undetermined	3 residents X-ray diagnosed pneumonia & 5 URTI	Lab test negative or noncontributory	Nursing Home	Person to Person
5	1/13/2010 15:25	1/13/2010 15:35	10	WV	Cabell	Acute Gastroenteritis	<i>Salmonella Enteritidis</i>	6/10 = 60%	Lab Confirmed	Household	Foodborne
6	1/15/2010 15:00	1/19/2010 9:15	5415	WV	Ohio	Acute Gastroenteritis	Norovirus Genotype II	75/192 Residents (AR 39%) 52/245 Staff (AR 21%)	Lab Confirmed	Nursing Home	Person to Person
7	1/20/2010	1/15/2010	7201	Multi-state CDC is the lead	Monongalia	Acute Gastroenteritis	<i>Salmonella Montevideo</i>	1	Lab Confirmed	community	Foodborne - Pepper products
8	1/20/2010 14:40	1/21/2010 13:30	1370	WV	Kanawha	Acute Gastroenteritis	Undetermined	9/60 residents (AR 15%)	Lab test not done	Nursing Home	Person to Person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
9	1/25/2010 10:00	1/25/2010 10:30	30	WV	Mercer	Upper Respiratory Illness	Undetermined	6/116 residents (AR 5%) and 2/147 staff (AR 1%)	Lab test not done	Nursing Home	Likely Person to Person
10	1/25/2010 8:00	Missing	Missing	WV	Wood	Acute Gastroenteritis	Undetermined	11/60 residents (18%) and 2/35 staff (5%)	Lab test not done	Nursing Home	Likely Point Source
11	2/4/2010 9:45	2/4/2010 10:00	15	WV	Greenbrier	Acute Gastroenteritis	Norovirus Genotype II	18/47 (AR: 38.3%)	Lab Confirmed	Banquet	Point source and secondary Person to Person transmission
12	2/4/2010 10:00	2/4/2010 10:30	30	WV	Kanawha	Acute Gastroenteritis	Norovirus Genotype II	The Highest Absentees Rate is 60%	Lab Confirmed	School	Person to Person
13	1/28/2010 15:30	2/8/2010 14:00	15750	WV	Jefferson	Chickenpox	Likely varicella zoster virus	7 cases (AR: 1.4%)	Lab test not done	School	Person to Person
14	2/19/2010 9:45	2/19/2010 10:00	15	WV	Kanawha	Upper Respiratory Illness	Undetermined	21/93 Residents (AR: 23%)	Lab test not done	Nursing Home	Person to Person
15	2/19/2010 15:30	2/17/2010 11:30	3121	WV	Cabell	Acute Gastroenteritis	Undetermined	17/120 Staff (AR 14.5%)	Lab test negative or noncontributory	Hospital OR/Recovery	Person to Person
16	3/1/2010 8:25	Missing	Missing	WV	Cabell	Rash	MRSA	2 Confirmed cases	Lab Confirmed	Athletic Team	Person to Person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
17	3/1/2010 11:30	3/1/2010 11:45	15	WV	Kanawha	Upper Respiratory Illness	Group A <i>Streptococcus</i>	7/20 children (AR 35%) and 1 adult	Rapid test positive but not culture confirmed	Daycare	Person to Person
18	3/5/2010	3/4/2010 10:20	821	WV	Kanawha	Chickenpox	Varicella zoster virus	Students: 12/1910 (AR: 0.6%)	Lab Confirmed	Schools	Person to Person
19	3/8/2010 12:20	3/8/2010 12:40	20	WV	Lewis, Barbour	Acute Gastroenteritis	Norovirus Genotype II	Missing	Lab Confirmed	Basketball tournament	Person to Person
20	Missing	3/9/2010 15:30	Missing	WV	Kanawha	Acute Gastroenteritis	Undetermined	15 residents and 4 staff	Lab test negative or noncontributory	Nursing Home	Person to Person
21	3/10/2010 14:15	3/11/2010 9:00	1125	WV	Fayette	Upper Respiratory Illness	Undetermined	5/24 Residents (AR 21%)	Lab test not done	Nursing Home	Likely person to person
22	3/10/2010	3/12/2010 14:45	3765	WV	Greenbrier	Acute Gastroenteritis	Norovirus Genotype II	36 of 53 Residents (AR: 68%) and 13 of 75 Staff (AR: 17%)	Lab Confirmed	Nursing Home	Person to Person
23	3/15/2010 11:30	3/15/2010 10:30	61	WV	Mingo	Upper Respiratory Illness	Undetermined	Staff (15)	Lab test negative or noncontributory	Hospital OR	Likely Person to Person
24	3/12/2010 15:30	3/12/2010 15:30	0	WV	Boone	Chickenpox	Varicella zoster virus	Students 6/599 (AR: 1%)	Lab Confirmed	School	person to person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
25	3/16/2010 15:47	3/16/2010 15:30	18	WV	Mercer	Acute Gastroenteritis	Undetermined	Students 12/110 (AR: 11%)	Lab test not done	School	Person to Person
26	3/22/2010 15:00	3/22/2010 15:00	0	WV	Marshall	Influenza-Like Illness	Undetermined	Undetermined	Lab test not done	School	Person to person
27	3/17/2010 13:45	3/17/2010 14:00	15	WV	Mercer	Acute Gastroenteritis	<i>Salmonella Enteritidis</i>	22	Lab Confirmed	Restaurant	Foodborne
28	3/25/2010 15:15	3/25/2010 15:40	25	WV	Greenbrier	Acute Gastroenteritis	Undetermined	8/65 (AR 12.3%) residents and 9/40 (AR 22.5%) staff	Lab test not done	Nursing Home	Person to Person
29	3/26/2010 10:00	3/26/2010 10:20	20	WV	Raleigh	Acute Gastroenteritis	Norovirus	30/68 Residents (AR: 44%) and 9 staff	Lab Confirmed	Nursing home	Point source and secondary Person to Person transmission
30	4/12/2010 11:00	4/12/2010 10:00	61	WV	Jefferson	Chickenpox	Varicella zoster virus	Students 7/520 (AR: 1%)	Lab Confirmed	School	Person to Person
31	4/15/2010 8:40	4/15/2010 9:10	30	WV	Wayne	Chickenpox	Varicella zoster virus	Students 13/340 (AR: 3.8%)	Lab Confirmed	School	Person to Person
32	4/15/2010 12:00	4/16/2010 9:12	1272	WV	Boone	Chickenpox	Varicella zoster virus	Students 28/526 (AR 5.3%)	Lab Confirmed	School	Person to Person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
33	4/16/2010 14:00	4/16/2010 14:00	0	WV	Wayne	Chickenpox	Likely varicella zoster virus	Students 4/245 (AR: 1.6%)	Lab test not done	School	Person to Person
34	4/30/2010 12:05	4/30/2010 12:10	5	WV	Wood	Upper Respiratory Illness	Group A <i>Streptococcus</i>	19/327 (AR: (6%))	Rapid test positive but not culture confirmed	School	Person to Person
35	5/4/2010 14:10	5/4/2010 14:45	35	WV	Monongalia	Acute Gastroenteritis	Undetermined	35 Residents and 29 Staff	Lab test not done	Nursing Home	Person to Person
36	5/4/2010 14:00	5/4/2010 14:35	35	WV	Webster	Rash / Folliculitis	Undetermined	6/16 (AR: 37.5 %)	Lab test not done	Camp	Point source (waterborne - Hot Tub)
37	Missing	Missing	Missing	WV	Mercer	Chickenpox	Likely varicella zoster virus	Students 12/730 (AR: 1.6%)	Lab test negative or noncontributory	School	Person to Person
38	5/12/2010 10:00	5/12/2010 10:00	0	WV	Fayette	Chickenpox	Likely varicella zoster virus	Students 20/429 (AR: 5%)	Lab test not done	School	Person to Person
39	Missing	Missing	Missing	WV	Wayne	Chickenpox	Likely varicella zoster virus	Students 8/543 (AR: 1.5%)	Lab test not done	School	Person to Person
40	5/20/2010 12:30	5/20/2010 12:45	15	WV	Greenbrier	Acute Gastroenteritis	Norovirus Genotype I	Students: 46/90 (AR:51%)	Lab Confirmed	School	Point source and secondary Person to Person transmission

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
41	5/20/2010 12:30	5/20/2010 12:45	15	WV	Monongalia , Green county, PA	Whooping Cough	<i>Bordetella pertussis</i> (PCR confirmed)	N/A	Lab Confirmed	Daycare	Person to Person
42	3/25/2010 11:48	3/25/2010	709	WV	Preston	Chickenpox	Likely varicella zoster virus	Students 13/534 (AR 2.5%)	Lab test not done	School	Person to Person
43	5/24/2010 16:00	5/24/2010 16:45	45	WV	Kanawha	Scabies	Likely <i>Sarcoptes scabiei</i>	9 Residents and 9 Staff	Lab test not done	Nursing Home	person to person
44	6/3/2010 13:55	6/3/2010 14:00	5	WV	Lewis	Chickenpox	Likely varicella zoster virus	Students 3/740 (AR: 0.4%)	Lab test not done	School	Person to Person
45	6/10/2010 15:30	6/10/2010 15:50	20	WV	Mercer	Upper Respiratory Illness	Rhinovirus	Residents 25/57 (AR 44%) Staff 3/150 (AR: 2%)	Lab Confirmed	Nursing Home	Person to person
46	Missing	6/18/2010 19:00	Missing	WV	Roane	Upper Respiratory Illness / Pneumonia	Human Metapneumovirus	14/30 residents and 3/? Staff	Lab Confirmed	Nursing Home	Person to person
47	6/23/2010 8:20	6/23/2010 8:30	10	WV	Mercer	Acute Gastroenter itis	Undetermined	9/39 residents (AR 23%)	Lab test negative or noncontrib utory	Nursing Home	Likely Point Source
48	6/29/2010	6/29/2010 14:30	870	WV	Boone	Scabies	Likely <i>Sarcoptes scabiei</i>	12/12 residents (AR 100%), 11/16 staff (AR 69%)	Lab test not done	Assisted Living Facility	Person to person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
49	Missing	7/7/2010 12:00	Missing	wv	kanawha	Hand, Foot and Mouth Disease	Likely enteroviral group	Children 3/170 (AR: 2%)	Lab test not done	Daycare	person to person
50	7/9/2010 15:00	7/9/2010 15:37	37	WV	Roane	Chickenpox	Likely varicella zoster virus	9 children	Lab test not done	Community	person to person
51	7/20/2010 15:40	7/20/2010 15:45	5	WV	Kanawha	scabies	Likely Sarcoptes scabiei	Residents 29 (AR: 22%) and Staff: 2	Lab test not done	Women Shelter	person to person
52	8/3/2010 16:00	8/4/2010 14:35	1355	WV	Ohio	Acute Gastroenteritis	<i>Bacillus Cereus</i>	Family members 10/10 (AR: 100%)	Lab Confirmed	Home	Foodborne (pizza)
53	8/6/2010 14:30	8/6/2010 13:45	46	WV	Randolph	Whooping Cough	<i>Bordetella pertussis</i> (PCR confirmed)	37 cases	Lab Confirmed	Community	Person to person
54	8/9/2010 14:07	8/9/2010 14:17	10	wv	Mercer	Upper Respiratory Illness	Rhinovirus	Residents: 33/102 (AR: 32%) Staff: 13/96 (AR14%)	Lab Confirmed	Nursing Home	person to person
55	8/25/2010 12:40	8/25/2010 13:10	30	WV	Wayne	Acute Gastroenteritis	Undetermined	Students 85/350 (AR: 24%) Staff: Unknown	Lab test negative or noncontributory	School	person to person
56	8/30/2010	8/31/2010 11:15	2115	WV	Kanawha	Acute Gastroenteritis	<i>Shigella sonnei</i>	105 cases (33 confirmed and 72 probable)	Lab Confirmed	Schools / Community	person to person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
57	9/1/2010 14:30	9/1/2010 15:30	60	WV	kanawha	Upper Respiratory Illness	Undetermined	Missing	Lab test not done	Nursing Home	Likely person to person
58	9/15/2010 10:30	9/15/2010 10:25	6	WV	Mercer	Upper Respiratory Illness	Undetermined	17/118 Residents (AR: 14.4%) and 12/145 Staff (AR:8%)	Lab test negative or noncontributory	Nursing Home	Person to person
59	9/16/2010 13:45	9/16/2010 13:55	10	WV	Preston	Whooping Cough	<i>Bordetella pertussis</i> (PCR confirmed)	Estimated 27 cases	Lab Confirmed	community	Person to person
60	Missing	Missing	Missing	WV	Wood	Conjunctivitis	Undetermined	10 Children and Two Adults	Lab test not done	Elem School	person to person
61	9/23/2010 14:50	9/24/2010 11:30	1240	wv	Brooke	Rash	MRSA	7 cases	Lab Confirmed	School	person to person
62	Missing	Missing	Missing	WV	Raleigh	Upper Respiratory Illness	Undetermined	27/157 residents (17% AR) and 10/218 Staff (4.5% AR)	Lab test not done	Nursing Home	Person to person
63	9/28/2010 15:50	9/28/2010 16:00	10	WV	Wood	Upper Respiratory Illness	Undetermined	20/64 (AR 31%) residents & 5/83 Staff (AR 6%)	Lab test negative or noncontributory	Nursing Home	person to person
64	9/30/2010 15:45	9/30/2010 16:05	20	WV	Monongalia	Upper Respiratory Illness	Undetermined	17 residents and 19 staff	Lab test negative or noncontributory	Nursing Home	Likely Person to Person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
65	9/30/2010 18:00	10/1/2010 9:00	900	WV	Kanawha	Hand, Foot and Mouth Disease	Likely enteroviral group	Daycare attendees 8/24 (AR:33%)	Lab test not done	Daycare	person to person
66	10/1/2010 16:00	10/1/2010 15:50	11	WV	Greenbrier	Upper Respiratory Illness	Undetermined	Residents 23/87 (AR: 26%)	Lab test negative or noncontributory	Nursing home	Likely Person to Person
67	10/5/2010 8:00	10/4/2010 9:00	1381	WV	Mercer	Chickenpox	Varicella zoster virus	Missing	Lab Confirmed	School	Person to Person
68	10/6/2010 10:45	10/6/2010 10:32	14	WV	Boone	Chickenpox	Likely varicella zoster virus	Students 3/550 (AR: 0.6%)	Lab test negative or noncontributory	School	Person to Person
69	10/8/2010 11:30	10/8/2010 11:50	20	WV	Jefferson	Upper Respiratory Illness	Group A <i>Streptococcus</i>	Students 17/433 (AR 4%)	Rapid test positive but not culture confirmed	School	Person to Person
70	8/13/2010 10:30	8/13/2010 14:20	230	WV	Monongalia	Upper Respiratory Illness	Undetermined	Missing	Lab test negative or noncontributory	Nursing Home	Person to person
71	10/25/2010 9:10	10/25/2010 9:15	5	WV	Mercer	Acute Gastroenteritis	Norovirus Genotype II	23/73 Residents (AR: 32%)	Lab Confirmed	Nursing home	Person to Person
72	10/27/2010 11:00	10/27/2010 11:30	30	WV	Wayne, Cabell, Jackson	Hepatitis	hepatitis A	Missing	Lab Confirmed	Community	Person to person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
73	11/1/2010 11:00	11/1/2010 11:00	0	WV	Harrison	Chickenpox	Likely varicella zoster virus	Students 3/580 (AR: 0.5%)	Lab test not done	School	Person to Person
74	11/11/2010 11:14	11/11/2010 11:11	4	WV	Wayne	Chickenpox	Likely varicella zoster virus	Students 8/253 (AR: 3.2%)	Lab test not done	School	Person to Person
75	11/9/2010 11:00	11/9/2010 11:10	10	WV	Kanawha	Scabies	Sarcoptes scabiei	3/120 Residents (AR 2.5%)	Lab Confirmed	Nursing Home	Person to Person
76	11/9/2010 16:00	11/9/2010 15:30	31	WV	Kanawha	Acute Gastroenteritis	Norovirus Genotype I	31/56 (AR: 55%) residents and 8/75 staff (AR: 11%)	Lab Confirmed	Nursing Home	Person to Person
77	11/12/2010 16:00	11/12/2010 15:30	31	WV	Monongalia	Whooping Cough	<i>Bordetella pertussis</i> (PCR confirmed)	Missing	Lab Confirmed	Community	Person to person
78	11/12/2010 14:30	11/16/2010 10:15	5505	WV	Fayette	Acute Gastroenteritis	Undetermined	Residents 28/80 (AR: 35%) and Staff 33	Lab test not done	Nursing Home	Person to Person
79	11/18/2010 11:15	11/18/2010 11:30	15	WV	Kanawha	Scabies	Likely Sarcoptes scabiei	Missing	Lab test not done	School	Person to person
80	11/19/2010 12:00	11/19/2010 16:00	240	WV	Ritchie	Scabies	Sarcoptes scabiei	Residents 8/54 (AR 15%)	Lab Confirmed	Nursing Home	person to person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
81	Missing	11/22/2010 10:00	Missing	WV	Roane	Upper Respiratory Illness	Undetermined	Students 29/497 (AR: 6%)	Lab test not done	School	person to person
82	Missing	11/29/2010 3:15	Missing	WV	Mercer	Whooping Cough	<i>Bordetella pertussis</i> (PCR confirmed)	4 confirmed cases and 7 probable	Lab Confirmed	Community	Person to person
83	11/19/2010 12:00	Missing	Missing	WV	Mercer	Chickenpox	Likely varicella zoster virus	Students 6	Lab test negative or noncontributory	School	Person to Person
84	12/1/2010 13:00	12/1/2010 13:50	50	WV	Mercer	Upper Respiratory Illness	Undetermined	Residents: 14/80 (17.5%)	Lab test not done	Nursing Home	Likely Person to Person
85	12/3/2010 11:00	12/3/2010 11:30	30	WV	Marshall	Scabies	Likely <i>Sarcoptes scabiei</i>	Inmates and staff: 32/300 (AR: 11%)	Lab test not done	Jail	Person to Person
86	12/7/2010 15:45	12/7/2010 15:45	0	WV	Putnam	Acute Gastroenteritis	Norovirus Genotype II	Residents 16/133 (AR:14%)	Lab Confirmed	Nursing Home	Person to Person
87	12/8/2010 16:30	12/8/2010 17:30	60	WV	Kanawha	Acute Gastroenteritis	Norovirus Genotype I & II	Residents: 47/92 (51%) Staff: 20/95 (21%)	Lab Confirmed	Nursing Home	Person to Person
88	12/9/2010 15:30	12/9/2010 15:47	17	WV	Kanawha	Acute Gastroenteritis	Norovirus Genotype I	Residents: 12/60 (AR: 20%), Staff : 5/40 (AR: 12.5%)	Lab Confirmed	Nursing Home	Person to Person

Number	Date and Time Reported to LHD	Date and Time Reported to State	Elapsed Time in Minutes	Jurisdiction	Counties with Cases	Clinical Diagnosis	Etiologic Agent	Final Case Count	Labs	Transmission	Modes of transmission or source of illness
89	11/16/2010 12:00	12/10/2010 14:03	34683	WV	Braxton	Chickenpox	Varicella zoster virus	Students 6/651 (AR: 0.9%)	Lab Confirmed	School	Person to Person
90	11/19/2010	12/10/2010 13:15	31035	WV	Marshall	Conjunctivitis	Undetermined	Students: 76/400 (AR: 19%)	Lab test negative or noncontributory	School	Likely Person to Person
91	12/13/2010 13:00	12/13/2010 13:30	30	WV	Wood	Acute Gastroenteritis	Norovirus Genotype II	residents: 47/92 (AR: 51%) staff: 49/125 (39 %)	Lab Confirmed	Nursing Home	Person to Person
92	12/23/2010 13:15	12/23/2010 12:30	46	WV	Kanawha	Scabies	Likely sarcoptes scabiei	Residents 8/89 (AR:9%) staff 2	Lab test not done	Nursing Home	Person to Person
93	12/28/2010 10:00	12/28/2010 11:00	60	WV	Ritchie	Acute Gastroenteritis	Norovirus Genotype II	residents: 33/55 (60%); Staff: 20/75 (27%)	Lab Confirmed	Nursing Home	Person to Person
94	12/31/2010 18:19	12/31/2010 18:40	21	WV	Kanawha	Acute Gastroenteritis	Undetermined	Residents: 16/117 (14%); Staff: 6	Lab test negative or noncontributory	Nursing Home	Person to Person
95	12/14/2010 12:00	1/19/2011 12:38	51878	WV	Jackson	Chickenpox	Likely varicella zoster virus	Students 4/213 (AR: 1.9%)	Lab test not done	school	Person to Person
96	10/27/2010 11:00	10/27/2010 11:30	30	WV	Cabell	Hepatitis	hepatitis A	Missing	Lab Confirmed	Community	Person to Person