

Report of 2002 Local Health Department Surveillance Assessment

Infectious Disease Epidemiology Program

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Beginning in 2001, as the Infectious Disease Epidemiology Program began releasing new disease surveillance protocols, surveillance evaluation measures were developed for each disease. The purpose of these ‘surveillance indicators’ is to provide ongoing measurement of the quality and completeness of surveillance data reported to the Bureau for Public Health. In 2002, as part of a larger assessment of readiness, local health departments used the indicators for the first time to evaluate their 2001 surveillance data, and a report was published by the Division of Surveillance and Disease Control. For the 2002 data, local health departments requested that the state compile and summarize the evaluation measures.

This report summarizes an evaluation of 2002 surveillance data using the indicators.

METHODS

Completed paper reports for cases reported to CDC during 2002 are maintained on file in the Division of Surveillance and Disease Control sorted by disease. Reports were manually sorted by county and reviewed for completeness by a summer intern using published surveillance indicators. Surveillance indicators are listed at the end of each protocol posted at: <http://www.wvdhhr.org/bph/oehp/sdc/A-Z/A-Z.htm>. Aggregate data for each disease and each county were entered into Excel, and a numerical percentage was calculated for aggregate data at the state level.

Data were compared to the 2001 surveillance assessment results.

RESULTS

1. Invasive *Streptococcus pneumoniae*:
 - a. Completeness of data improved for most indicators between 2001 and 2002 (Table I):

Table I Completeness of Invasive <i>Streptococcus pneumoniae</i> Investigations, West Virginia, 2001-2002		
Surveillance Indicator	% Complete, 2001 (N=119)	% Complete, 2002 (N=136)
Type of Infection	76%	90%
Specimen Source	79%	100%
Vaccine History	13%	54%
Medical Conditions	33%	74%
Antibiotic Susceptibility Profile	74%	91%
Capsular Type	4%	10%

- b. Fifty-nine percent of cases were reported to the local health department in less than 3 weeks. In 15% of cases, date of report to the local health department was missing.

This evaluation documented improvement in the quality of surveillance data between 2001 and 2002. Serotyping is now available from the Office of Laboratory Services. This should result in an improved proportion of isolates typed in future years.

The date of case report to the local health department was missing in 15% of cases; making it difficult to evaluate timeliness of reporting. Local health departments should systematically record the date of report so they can document and correct any delays in reporting.

2. Influenza
 - a. Fifty-one counties reported influenza-like illness at least once during 2002.
 - b. Twelve counties performed virologic surveillance at some time during 2002.

At the state level, influenza surveillance involves a combination of virologic surveillance conducted through 4 laboratories statewide, including the Office of Laboratory Services. In addition, influenza-like-illness is reportable in West Virginia year-round. These data combine to give a very complete picture of influenza activity at the state level. Data that are incomplete at the local level will give an incomplete or even misleading picture of influenza activity at the local level.

Influenza is the cause of an estimated 36,000 deaths annually in the United States and should not be underestimated as a source of morbidity and mortality. West Virginia has a high prevalence of individuals with chronic disease and a large population of elderly persons, who may suffer disproportionately during influenza season.

3. West Nile virus and LaCrosse:
 - a. Over 90% of all reported encephalitis cases were appropriately tested for all geographically relevant arboviruses (West Nile virus (WNV), Saint Louis encephalitis (SLE), eastern equine encephalitis (EEE) and La Crosse encephalitis (LAC)). This has improved significantly from 2001.
 - b. All counties submitted at least one dead bird for WNV testing during 2002.
 - c. Forty-one (76%) of 54 counties submitted dead bird reports for 50% or more of the summer. Wetzel and Tyler Counties filed a joint report.
 - d. LaCrosse investigations: Table III contrasts the completeness of LaCrosse investigations between 2001 and 2002.

Table III Completeness of LaCrosse Encephalitis Investigations, West Virginia, 2001-2002		
Surveillance indicator	% Complete, 2001 (N=40)	% Complete, 2002 (N=40)
Geographic, travel and exposure history	93%	85%
GIS reading	60%	60%
Documented home visit	88%	77%

This represents a major improvement in the proportion of encephalitis cases appropriately tested for WNV, SLE, LAC and EEE. Fewer than half of all encephalitis cases were appropriately tested during the previous season. The improvement is related to enhanced testing capacity at the Office of Laboratory Services.

LaCrosse investigations are important to document risk factors and identify geographic clustering. The availability of a GIS reading on the case enables investigators to match mosquito surveillance data with data from human surveillance and draw conclusions about mosquito species and breeding sites that may put West Virginia children at risk in future years.

4. Non-typhoidal Salmonella:

a. Completeness of investigations is contrasted between 2001 and 2002 in Table IV:

Table IV Completeness of Salmonellosis Investigations, West Virginia, 2001-2002		
Surveillance Indicator	Percent Complete, 2001 (N=98)	Percent Complete, 2002 (N=173)
Complete demographic information	87%	92%
Information on high-risk occupations	87%	91%
Antibiotic susceptibility profile	67%	63%
Complete risk factor investigation	41%	42%
Known serotype	80%	78%

b. Ninety-one (53%) of 173 Salmonella cases were reported in less than 3 weeks. Date of report to the local health department was unknown in 39 (23%) of cases.

Delays in reporting cases of Salmonellosis may contribute to difficulty in completing a good quality investigation. Local health departments should collaborate with reporting sources to improve the timeliness of reporting. Outbreaks of Salmonellosis are identified through a combination of good epidemiological investigation and good laboratory evaluation, including serotyping and PFGE.

5. Campylobacteriosis:

a. A comparison of quality and completeness of investigations of 2002 cases versus 2001 cases is listed in Table V:

Table V Completeness of Campylobacteriosis Investigations, West Virginia, 2001-2002		
Surveillance Indicator	Percent Complete, 2001 (N=71)	Percent Complete, 2002 (N=107)
Complete demographic information	95%	87%
Information on high-risk occupation	76%	87%
Complete risk factor investigation	50%	38%
OLS Confirmation	4%	7%

- b. Forty percent of Campylobacteriosis cases were reported to local health departments in less than 3 weeks after onset. Date of report to local health department was not recorded in 35% of cases.

The Office of Laboratory Services offers PFGE of *Campylobacter* isolates. Local Health Departments should encourage their providers to send isolates to OLS.

6. *E coli* O157:H7

- a. Quality of investigation is compared for 2001 and 2002 cases in Table VI:

Table VI Completeness of <i>E coli</i> O157:H7 Investigations, West Virginia, 2001-2002		
Surveillance Indicator	Percent Complete, 2001 (N=9)	Percent Complete, 2002 (N=11)
Complete demographic information	100%	91%
Information on high-risk occupation	78%	100%
OLS confirmation/PFGE	67%	73%
Complete risk factor investigation	78%	55%

- b. Forty-five percent of *E coli* O157:H7 cases were reported to local health departments within 14 days of onset.

Complete laboratory and epidemiological investigation of *E coli* O157:H7 cases is important because of the potential for this organism to cause outbreaks due to food or water contamination or person-to-person spread. Some large community outbreaks have resulted in deaths among previously healthy young children.

7. Invasive meningococcal disease

- a. Completeness of investigation for invasive meningococcal disease is summarized for 2002 data only (Table VII). Completeness was not assessed during 2001 because surveillance indicators had not yet been developed for this disease.

Table VII Completeness of Invasive Meningococcal Disease Investigations, West Virginia, 2002	
Surveillance Indicator	Percent Complete, 2002 (N=5)
Type of infection recorded	100%
Specimen source recorded	100%
Medical conditions recorded	60%
Complete demographic information	100%

- b. Eighty percent of cases were reported to local health departments within one week of diagnosis.

Serogroup information is important for management of outbreaks due to invasive meningococcal disease; thus local health departments should educate laboratories about the need to routinely submit isolates for serogrouping.

8. Invasive *Haemophilus influenzae*

- a. Completeness of investigation for invasive *Haemophilus influenzae* is summarized for 2002 data only (Table VIII). Completeness was not assessed during 2001 because surveillance indicators had not yet been developed for this disease.

Table VIII Completeness of Invasive <i>Haemophilus influenzae</i> Investigations, West Virginia, 2002	
Surveillance Indicator	Percent Complete, 2002 (N=19)
Complete demographic information	100%
Type of infection recorded	95%
Specimen source recorded	100%
Vaccination history recorded (age \leq 5 years; N=2)	50%
Antibiotic susceptibility recorded	37%
Known serotype or known to be untypeable	58%

- b. Forty-eight percent of invasive *Haemophilus influenzae* cases were reported to local health departments in less than 3 weeks after onset. Date of report to the local health department was not recorded in 37%.

Invasive *Haemophilus influenzae* type b was formerly the most common cause of bacterial meningitis in infants and children prior to availability of the conjugate vaccine. Since then, the disease has been nearly eliminated. Surveillance for this now rare condition continues to be important, however. Good case investigation includes determination of the serotype of the isolate and vaccination status of children. Timely reporting facilitates both referral of the isolate to the Office of

Laboratory Services for serotyping and prophylaxis of appropriate contacts to cases of invasive *Haemophilus influenzae* type b. Prophylaxis of contacts is unnecessary if the isolate is non-type b.

9. Hepatitis A

- a. Completeness of investigation for hepatitis A is summarized for 2002 data only (Table IX). Completeness was not assessed during 2001 because surveillance indicators had not yet been developed for this disease.

Table IX Completeness of Hepatitis A Investigations, West Virginia, 2002	
Surveillance indicator	Percent Complete, 2002 (N=21)
Complete demographic information	95%
Complete clinical information	57%
Complete risk factor investigation	67%
Vaccination history	54%

- b. Twenty-nine percent of hepatitis A cases were reported to local health departments within 14 days of onset. Date of report was not recorded for 62% of cases.

Timeliness of reporting is critical for this disease because of the need to implement control measures. Complete investigation includes an interview to identify risk factors during the incubation period and vaccination status. Clinical information, including symptom onset or other information necessary for case ascertainment was missing on some cases. Patients without acute onset of symptoms should not be counted as acute hepatitis A.

10. Hepatitis B

- a. Completeness of investigation for hepatitis B is summarized for 2002 data only (Table X). Completeness was not assessed during 2001 because surveillance indicators had not yet been developed for this disease.

Table X Completeness of Hepatitis B Investigations, West Virginia, 2002	
Surveillance indicator	Percent Complete, 2002 (N=22)
Complete demographic information	100%
Complete clinical information	86%
Complete risk factor investigation	100%
Vaccination history	95%

- b. Thirty-two percent of cases were reported to local health departments within 14 days of onset. Date of report was missing in 9 (41%) of cases.

Rapid reporting of this disease is important because vaccine and hepatitis B immune globulin can be given to sexual and needle-sharing contacts to prevent transmission. Local health departments should consistently document date of report so that delays in reporting can be documented and corrected. While clinical information (e.g., hospitalization or death) was incomplete on a few cases, sufficient information was available for case ascertainment purposes.

11. Hepatitis C

- a. Completeness of investigation for hepatitis B is summarized for 2002 data only (Table XI). Completeness was not assessed during 2001 because surveillance indicators had not yet been developed for this disease.

Table XI Completeness of Hepatitis C Investigations, West Virginia, 2002	
Surveillance indicator	Percent Complete, 2002 (N=3)
Complete demographic information	100%
Complete clinical information	100%
Complete risk factor investigation	100%

- b. All cases were reported to the local health department within 2 weeks of onset. Investigations of hepatitis C were complete, and timeliness of reporting was adequate during 2002.

DISCUSSION

Some differences in the way these data were collected limit the comparisons that can be made from 2001 to 2002. For data reported in 2001, local health departments performed a self-assessment of their own records, reviewing cases that they had on-file. Participation was voluntary and some counties chose not to submit information. Quality of assessment likely varied among counties; thus intercounty comparisons were probably not valid using the 2001 data. For this assessment of 2002 data, all cases from all counties on file at the state level were evaluated. All cases were reviewed by a single evaluator using standard criteria. Thus, intercounty comparisons are likely to be valid for the 2002 data; whereas caution should be used in making comparisons between the 2001 and 2002 data unless large differences exist. Nonetheless, these data represent a broad assessment of the completeness of surveillance data in West Virginia, and are useful for targeting specific areas for improvement.

These surveillance assessment data demonstrate substantial improvement in the completeness of surveillance data for arboviral disease and for invasive *Streptococcus pneumoniae*. Baseline data for hepatitis A, B and C, meningococcus and Haemophilus influenzae were generated for the first time.

Incomplete investigations were documented for foodborne pathogens, including *Salmonella* and *E coli* O157:H7. *Salmonella* and *E coli* O157:H7 outbreaks are not detected without careful ongoing laboratory and epidemiological investigation in real time. Review of the surveillance

indicators for these diseases demonstrate that West Virginia must sustain effort to improve these investigations.

Improvements in laboratory capacity have led to improvements in arbovirus testing and may be expected to yield improved surveillance for other pathogens in the near future. Enhanced funding for epidemiological response has allowed the Bureau for Public Health to offer regular training in case investigations and to fund local health department staff who perform investigations. This, together with the increased availability of standardized surveillance protocols and investigation forms should assist local health departments in their quest to improve surveillance in their communities.

Finally, the Bureau for Public Health must continue to enhance feedback of surveillance and surveillance evaluation data for the overall system to continue to improve. Surveillance data may be found at: <http://www.wvdhhr.org/bph/oehp/sdc/a-z/a-z-idep.htm>

RECOMMENDATIONS

Local health departments should review these data carefully to identify and prioritize issues they can correct. The most common issues included:

- **Delays in reporting.** Open, non-judgmental discussion of reporting issues with providers is often a very productive way to improve reporting. Providers may not understand the implications of a delayed report unless it is explained to them. In some cases, direct communication with local health departments and hospitals in other states may facilitate rapid, direct reporting across state lines.
- **Lack of documentation of date of report to the local health department.** This data is important for evaluating and addressing reporting delays. Local health department administrators should assure that reports are stamped or otherwise dated when first received at the local health department.
- **Incomplete laboratory surveillance.** Of the pathogens evaluated in this report, arbovirus, *Salmonella*, *Campylobacter*, enterotoxigenic *E coli*; and invasive *Streptococcus pneumoniae*, *Neisseria meningitides*, and *Haemophilus influenzae* specimens should be submitted to the Office of Laboratory Services for further studies. Again, informal discussion with providers and laboratories is often all that is needed to correct this problem.
- **Incomplete investigations.** Local health department administrators should assure that staff who are assigned investigations have the time and resources to complete them well. Guidelines and standard investigation forms are found in the Reportable Disease Protocol Manual and on the web. Training is available on a quarterly basis, and consultation (800-423-1271) is encouraged any time there are questions about how an investigation should proceed.

County specific data for each surveillance indicator are shown in Tables XII through XXII.

Table XII

Invasive *Streptococcus pneumoniae* Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Case Information							Time from symptom onset to LHD reporting date				
		Demo-graphic data complete	Type of Infection recorded	Specimen Source Recorded	Vaccine History Recorded	Medical Conditions Recorded	Antibiotic Sensitivities Available	Capsular Type Available	<1Wk	1-2 Weeks	3-4 Weeks	>4 Weeks	Unknown
Barbour	3	3	3	3	3	3	3	0	0	1	2	0	0
Berkeley	5	5	5	5	4	4	4	0	1	2	2	0	0
Boone	1	1	1	1	0	1	1	0	1	0	0	0	0
Braxton	2	2	2	2	1	2	2	0	2	0	0	0	0
Brooke	5	5	5	5	4	5	3	0	0	4	1	0	0
Cabell	9	9	8	9	4	8	8	0	0	7	1	1	0
Fayette	5	5	5	5	4	4	5	1	1	2	1	0	1
Gilmer	1	1	1	1	1	0	1	1	1	0	0	0	0
Grant	1	1	1	1	1	1	1	0	0	1	0	0	0
Greenbrier	1	1	1	1	1	1	1	0	1	0	0	0	0
Hancock	4	4	4	4	3	3	4	0	0	4	0	0	0
Harrison	2	2	2	2	1	1	2	1	1	0	0	0	1
Jackson	2	2	2	2	1	1	2	0	1	0	1	0	0
Jefferson	2	2	1	2	1	1	1	0	0	0	2	0	0
Kanawha	17	17	16	17	5	7	13	8	1	7	2	1	6
Lincoln	3	3	3	3	3	3	2	1	1	0	1	1	0
Logan	7	7	7	7	4	7	7	0	0	7	0	0	0
Marion	6	6	6	6	2	5	6	0	4	1	1	0	0
Marshall	5	5	4	5	3	4	5	0	1	2	0	0	2
Mercer	9	9	7	9	1	6	9	0	0	0	2	0	7
Mingo	2	2	2	2	0	2	2	0	0	0	1	1	0
Monroe	1	1	1	1	1	1	1	0	0	0	1	0	0
Nicholas	2	2	2	2	2	2	2	0	1	0	1	0	0
Ohio	10	10	10	10	8	7	10	0	2	4	2	0	2
Preston	2	2	2	2	1	2	2	0	0	0	1	1	0
Putnam	2	2	0	2	0	0	2	1	0	1	1	0	0
Raleigh	3	3	3	3	2	2	3	0	1	2	0	0	0
Randolph	10	10	9	10	7	7	10	0	3	6	1	0	0
Roane	1	1	1	1	0	1	1	0	0	0	1	0	0
Tucker	2	2	0	2	0	0	2	0	0	1	1	0	0
Upshur	2	2	2	2	2	2	1	0	1	1	0	0	0
Wayne	4	4	2	4	1	2	3	0	0	1	2	0	1

Table XIIInvasive *Streptococcus pneumoniae* Surveillance Assessment Data, West Virginia, 2002

	Case Information								Time from symptom onset to LHD reporting date				
Wetzel	1	1	1	1	1	1	1	0	0	0	1	0	0
Wyoming	4	4	4	4	1	4	4	0	1	2	2	0	0
Total	136	136	123	136	73	100	124	13	25	56	31	5	20
Percent	100%	100%	90%	100%	54%	74%	91%	10%	18%	41%	23%	4%	15%

Table XIII

Influenza and Influenza-Like-Illness Surveillance Assessment Data, West Virginia , 2002

County	Virologic surveillance performed in the jurisdiction
Barbour	N
Berkeley	N
Boone	N
Braxton	Y
Brooke	N
Cabell	Y
Clay	N
Doddridge	N
Fayette	N
Gilmer	Y
Grafton-Taylor	Y
Grant	N
Greenbrier	N
Hampshire	N
Hancock	N
Hardy	N
Harrison	Y
Jackson	N
Jefferson	N
Kanawha	Y
Lewis	N
Lincoln	Y
Logan	N
Marion	N
Marshall	N
Mason	N
McDowell	N
Mercer	N

Table XIII

Influenza and Influenza-Like-Illness Surveillance Assessment Data, West Virginia , 2002

County	Virologic surveillance performed in the jurisdiction
Mid-Ohio Valley	
Wood	N
Ritchie	N
Wirt	N
Roane	N
Calhoun	N
Pleasants	N
Mineral	N
Mingo	N
Monongalia	Y
Monroe	Y
Morgan	N
Nicholas	N
Ohio	Y
Pendleton	N
Pocahontas	N
Preston	N
Putnam	N
Raleigh	N
Randolph	N
Summers	Y
Tucker	N
Upshur	N
Wayne	N
Webster	Y
Wetzel-Tyler	N
Wirt	N
Wyoming	N
Total counties participating	12
Total reports received	n/a
Average number of weeks ILI was reported	n/a

TABLE XIV

West Nile Virus and LaCrosse Encephalitis Surveillance Assessment Data, 2002, West Virginia

County	West Nile Virus			Encephalitis Cases			LaCrosse Encephalitis			
	Number of Dead Birds Tested	Number (%) of Weeks Dead Bird Report was Submitted	Number of WNV Cases	Number of Other Encephalitis Cases	Total Number of Encephalitis Cases	Number (%) of Encephalitis Cases with Complete Arbovirus Panel	Number of LaCrosse Cases	Cases with Complete Geographic, travel, exposure history	Cases with GIS Reading	Cases with a Completed HomeVisit
Barbour	22	2 (7)	0	0	0		0	0	0	0
Berkeley	19	26 (96)	0	0	0		0	0	0	0
Boone	9	4 (15)	0	1	2	1 (50)	1	1	1	1
Braxton	4	5 (19)	0	0	0		0	0	0	0
Brooke	20	0 (0)	0	0	0		0	0	0	0
Cabell	7	0 (0)	0	1	1	1 (100)	0	0	0	0
Calhoun	10	15 (56)	0	0	0		0	0	0	0
Clay	6	19 (70)	0	0	0		0	0	0	0
Doddridge	16	23 (85)	0	0	0		0	0	0	0
Fayette	17	15 (56)	0	0	11	11 (100)	11	10	7	10
Gilmer	9	23 (85)	0	0	0		0	0	0	0
Grant	5	21(78)	0	0	0		0	0	0	0
Greenbrier	12	16 (59)	0	0	4	4 (100)	4	3	0	1
Hampshire	9	15 (56)	0	0	0		0	0	0	0
Hancock	13	23 (85)	0	0	0		0	0	0	0
Hardy	8	19 (70)	0	0	0		0	0	0	0
Harrison	32	22 (81)	0	1	1	0 (0)	0	0	0	0
Jackson	1	25 (93)	0	0	0		0	0	0	0
Jefferson	21	20 (74)	0	0	0		0	0	0	0
Kanawha	14	14 (52)	0	2	3	3 (100)	1	1	0	1
Lewis	32	25 (93)	0	0	0		0	0	0	0
Lincoln	7	14 (52)	0	0	0		0	0	0	0
Logan	23	17 (63)	0	0	1	1 (100)	1	1	1	1
Marion	18	10 (37)	0	0	0		0	0	0	0
Marshall	31	20 (74)	0	0	0		0	0	0	0
Mason	10	22 (81)	0	1	1	1 (100)	0	0	0	0

TABLE XIV

West Nile Virus and LaCrosse Encephalitis Surveillance Assessment Data, 2002, West Virginia

County	West Nile Virus			Encephalitis Cases			LaCrosse Encephalitis			
	Number of Dead Birds Tested	Number (%) of Weeks Dead Bird Report was Submitted	Number of WNV Cases	Number of Other Encephalitis Cases	Total Number of Encephalitis Cases	Number (%) of Encephalitis Cases with Complete Arbovirus Panel	Number of LaCrosse Cases	Cases with Complete Geographic, travel, exposure history	Cases with GIS Reading	Cases with a Completed HomeVisit
McDowell	6	8 (30)	0	0	2	1 (50)	2	2	0	2
Mercer	10	21 (78)	0	0	9	9 (100)	9	5	4	4
Mineral	10	25 (93)	0	0	0		0	0	0	0
Mingo	30	0 (0)	0	0	0		0	0	0	0
Monongalia	55	14 (52)	0	0	1	0 (0)	1	1	1	1
Monroe	4	25 (93)	0	0	0		0	0	0	0
Morgan	15	11 (41)	0	0	0		0	0	0	0
Nicholas	21	19 (70)	0	0	1	1 (100)	1	1	1	1
Ohio	28	11 (41)	0	0	0		0	0	0	0
Pendleton	6	23 (85)	0	0	0		0	0	0	0
Pleasants	16	24 (89)	0	0	0		0	0	0	0
Pocahontas	2	24 (89)	0	0	0		0	0	0	0
Preston	14	26 (96)	0	0	1	1 (100)	1	1	1	1
Putnam	8	26 (96)	1	0	1	1 (100)	0	0	0	0
Raleigh	20	27 (100)	0	2	9	9 (100)	7	7	7	7
Randolph	15	27 (100)	0	0	0		0	0	0	0
Ritchie	15	18 (67)	0	0	0		0	0	0	0
Roane	8	19 (70)	0	0	0		0	0	0	0
Summers	15	18 (67)	0	0	0		0	0	0	0
Taylor	9	9 (33)	0	0	0		0	0	0	0
Tucker	12	4 (15)	0	0	0		0	0	0	0
Upshur	71	20 (74)	0	0	0		0	0	0	0
Wayne	20	16 (59)	0	0	0		0	0	0	0
Webster	14	11 (41)	0	0	0		0	0	0	0
Wetzel-Tyler	29	23 (85)	0	0	0		0	0	0	0
Wirt	15	18 (67)	0	0	0		0	0	0	0
Wood	39	23 (85)	2	0	2	2 (100)	0	0	0	0
Wyoming	21	26 (96)	0	0	1	1 (100)	1	1	1	1
Total	903		3	8	51	47 (92)	40	34	24	31

Table XV
Salmonellosis Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Case Information					Time between symptom onset and date of report to LHD				
		Cases Confirmed by OLS	Cases with Complete Demographic Information	Cases with Complete Information on High Risk Occupations	Cases with Antibiotic Susceptibility Profile	Cases with Complete Risk Factor Investigation	Within 1 week	1-2 Weeks	3-4 Weeks	>4 Weeks	Unknown
Berkeley	8	7	6	6	2	0	1	2	1	2	2
Boone	1	1	1	1	1	0	0	1	0	0	0
Braxton	1	0	1	1	0	0	0	0	0	1	0
Brooke	3	1	3	3	1	0	0	0	1	1	1
Cabell	8	5	8	8	4	8	4	3	1	0	0
Calhoun	1	0	1	1	1	0	0	0	0	0	1
Fayette	6	5	6	6	5	6	2	0	1	0	3
Grant	1	1	1	1	1	0	0	1	0	0	0
Greenbrier	7	5	6	6	5	0	1	1	2	2	1
Hampshire	6	3	5	4	3	3	2	0	2	0	2
Hancock	2	0	2	2	0	1	1	1	0	0	0
Hardy	4	4	4	4	1	0	0	0	2	1	1
Harrison	3	3	3	3	3	2	0	0	2	0	1
Jefferson	4	4	4	4	4	2	2	0	1	0	1
Kanawha	15	14	14	14	14	0	6	3	4	0	2
Lincoln	2	2	2	2	1	1	1	0	0	0	1
Logan	3	0	2	2	2	2	0	1	0	0	2
Marion	7	7	7	7	4	5	4	0	1	1	1
Marshall	3	1	3	3	2	3	1	1	1	0	0
Mason	3	3	3	3	1	0	1	1	1	0	0
McDowell	1	1	1	1	1	0	1	0	0	0	0
Mercer	10	8	10	10	5	1	0	0	0	0	10
Mineral	3	3	3	2	2	2	0	1	0	1	1
Mingo	1	0	1	1	1	0	0	0	1	0	0
Monongalia	10	9	10	10	5	9	3	2	0	2	3
Monroe	4	4	4	3	2	1	1	3	0	0	0
Nicholas	3	3	3	3	3	2	1	2	0	0	0
Ohio	8	8	8	8	6	5	1	2	0	1	4
Pleasants	1	1	1	1	1	1	0	1	0	0	0
Pocahontas	2	2	1	2	1	0	0	1	0	0	1

Table XV
Salmonellosis Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Case Information					Time between symptom onset and date of report to LHD				
		Cases Confirmed by OLS	Cases with Complete Demographic Information	Cases with Complete Information on High Risk Occupations	Cases with Antibiotic Susceptibility Profile	Cases with Complete Risk Factor Investigation	Within 1 week	1-2 Weeks	3-4 Weeks	>4 Weeks	Unknown
Preston	4	3	4	4	2	4	2	2	0	0	0
Putnam	5	4	5	5	2	1	2	2	0	0	1
Raleigh	3	3	3	3	3	3	0	3	0	0	0
Randolph	3	3	3	3	3	1	0	2	0	0	1
Roane	3	1	1	1	1	1	0	1	0	0	2
Summers	2	1	2	2	2	2	0	1	1	0	0
Taylor	3	1	1	1	1	1	0	1	0	0	2
Tucker	1	1	1	1	1	1	1	0	0	0	0
Upshur	4	4	4	4	4	2	1	3	0	0	0
Webster	1	1	1	1	1	1	0	1	0	0	0
Wetzel	4	1	3	3	3	1	2	1	0	0	1
Wood	7	5	6	5	2	0	4	0	0	0	3
Wyoming	2	2	2	2	2	0	0	2	0	0	0
Total	173	135	160	157	109	72	45	46	22	12	39
	100%	78%	92%	91%	63%	42%	26%	27%	13%	7%	23%

Table XVI
Campylobacteriosis Surveillance Assessment Data 2002

County	Total Cases	Case Information				Time between symptom onset and date reported to LHD				
		Cases with Complete Demographic Information	Cases with Complete Information on High-Risk Occupations	Cases with Complete Risk factor Information	Cases with OLS Confirmation	Within 1 week	1-2 Weeks	3-4 Weeks	>4 Weeks	Unknown
Berkeley	6	5	5	1	0	2	2	1	0	1
Cabell	10	10	10	8	2	3	3	1	2	1
	1	1	1	0	0	0	0	0	0	1
	1	1	1	0	0	0	1	0	0	0
	5	5	5	0	0	0	3	1	1	0
	4	3	3	3	0	0	0	0	0	4
	3	3	3	0	0	0	0	0	2	1
	3	2	2	3	0	1	0	0	0	2
	7	5	4	3	0	0	3	1	0	3
	6	6	6	0	0	3	0	2	0	1
	4	4	4	0	0	1	1	0	2	0
	8	5	5	4	0	0	3	0	0	5
	1	0	0	1	0	0	1	0	0	0
	1	1	1	0	0	1	0	0	0	0
	2	2	2	1	0	2	0	0	0	0
	1	1	1	0	0	0	0	0	0	1
	6	5	5	0	0	0	0	0	0	6
	5	5	5	3	0	1	0	3	1	0
	4	3	3	0	0	0	2	0	1	1
	5	5	5	3	0	0	0	2	0	3
	2	2	2	0	0	0	1	0	1	0
	1	1	1	0	0	0	0	0	1	0
	1	1	1	0	0	0	0	0	0	1
	2	2	2	2	0	1	0	0	0	1
	2	2	2	2	1	1	0	1	0	0
	1	1	1	1	0	0	1	0	0	0
	2	2	2	0	1	0	0	1	0	1
	5	5	5	5	3	1	1	2	0	1
	1	1	1	0	0	0	0	0	1	0
	2	1	2	0	1	0	1	0	0	1

Table XVI
Campylobacteriosis Surveillance Assessment Data 2002

County	Total Cases	Case Information				Time between symptom onset and date reported to LHD				
		Cases with Complete Demographic Information	Cases with Complete Information on High-Risk Occupations	Cases with Complete Risk factor Information	Cases with OLS Confirmation	Within 1 week	1-2 Weeks	3-4 Weeks	>4 Weeks	Unknown
Wayne	2	1	1	1	0	0	1	0	0	1
	3	2	2	0	0	0	2	0	0	1
	107	93	93	41	8	17	26	15	12	37
Percent	100%	87%	87%	38%	7%	16%	24%	14%	11%	35%

Table XVII
E coli O157:H7 Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Case Information				Time from onset to date of report to LHD			
		Cases with Complete Demographic Information	Cases with Complete In n High-Risk Occupations	Cases with OLS confirmation	Cases with complete Risk factor Investigation	≤7 days	8-14 days	>14 days	Unknown
Doddridge	2	2	2	2	2	1	1	0	0
Grant	1	0	1	1	0	0	0	0	1
Greenbrier	1	1	1	1	0	0	1	0	0
Hardy	1	1	1	0	1	1	0	0	0
Kanawha	2	2	2	2	0	0	0	2	0
Monongalia	2	2	2	0	1	1	0	0	1
Raleigh	1	1	1	1	1	0	0	1	0
Wood	1	1	1	1	1	0	0	1	0
Total	11	10	11	8	6	3	2	4	2
Percent	100%	91%	100%	73%	55%	27%	18%	36%	18%

Table XVIII
 Invasive Meningococcal Disease Surveillance Assessment Data, West Virginia, 2002

Case Information							T					
County	Total Cases	Type of Infection Recorded	Specimen Source Recorded	Cases with Serogroup Information	Cases with Medical Conditions Recorded	Cases with Complete Demographic Information	Within 24 hours	1 day - 1 week	1-2 weeks	3-4 weeks	>4 weeks	Unknown
Greenbrier	1	1	1	1	0	1	0	1	0	0	0	0
Raleigh	1	1	1	0	0	1	0	0	1	0	0	0
Boone	1	1	1	0	0	1	1	0	0	0	0	0
Wood	1	1	1	1	0	1	1	0	0	0	0	0
Ohio	1	1	1	1	0	1	0	1	0	0	0	0
Total	5	5	5	3	0	5	2	2	1	0	0	0
Frequency	100	100	100	60	0	100	40	40	20	0	0	0

Table XIX
Invasive *Haemophilus influenzae* Surveillance Assessment Data, West Virginia, 2002

County	Case Information							Time between symptom onset and LHD reporting date				
	Total Cases	Complete Demographic Information	Type of Infection Recorded	Specimen Source Recorded	Vaccine History Recorded (Age ≤ 5; N=2)	Antibiotic susceptibility recorded	Serotype Available	<1 Week	1-2 Weeks	3-4 Weeks	>4 Weeks	Unknown
Berkeley	1	1	1	1	n/a	1	0	0	0	0	0	1
Cabell	2	2	2	2	n/a	2	2	0	0	1	0	1
Jefferson	1	1	1	1	n/a	0	0	0	0	0	0	1
Kanawha	6	6	6	6	n/a	0	2	4	0	0	0	2
Lincoln	1	1	1	1	n/a	0	1	0	0	1	0	0
Logan	1	1	1	1	n/a	1	0	0	0	0	0	1
Marion	1	1	1	1	n/a	1	1	1	0	0	0	0
Mason	1	1	0	1	0	0	0	0	0	0	1	0
McDowell	1	1	1	1	n/a	0	0	0	0	0	0	1
Mercer	1	1	1	1	n/a	0	1	0	0	0	0	1
Putnam	2	2	2	2	1	0	2	1	1	0	0	0
Raleigh	1	1	1	1	n/a	1	1	0	1	0	0	0
Upshur	1	1	1	1	n/a	1	1	1	0	0	0	0
Total	20	20	19	20	1	7	11	7	2	2	1	8
Percent	100%	100%	95%	100%	50%	35%	55%	35%	10%	10%	5%	40%

Table XX
Hepatitis A Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Case Information				Time from onset of symptoms to date of report to LHD			
		Complete Demographic Information	Complete Clinical Information	Complete Risk Factor Investigation	Complete Vaccination History	<7 days	8-14 days	>14 days	Unknown
Brooke	2	2	0	0	0	0	1	1	0
Gilmer	1	1	1	1	0	0	0	0	1
Hampshire	2	2	0	0	0	0	0	0	2
Hancock	3	3	3	3	0	0	2	0	1
Kanawha	2	2	2	2	0	0	0	0	2
Logan	1	1	1	1	0	0	0	0	1
Monroe	2	2	1	2	0	1	0	0	1
Preston	2	2	0	0	0	0	0	0	2
Putnam	1	0	0	1	1	0	0	0	1
Raleigh	3	3	3	3	1	1	0	1	1
Wetzel	1	1	1	1	0	0	1	0	0
Wood	1	1	0	0	0	0	0	0	1
Total	21	20	12	14	2	2	4	2	13
Frequency	100%	95%	57%	67%	10%	10%	19%	10%	62%

Table XXI
Hepatitis B Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Patient Information				Time from onset of symptoms to date of report to LHD			
		Complete Demographic Information	Complete Clinical Information	Complete Risk Factor Investigation	Complete Vaccination History	≤7 Days	8-14 Days	>14 Days	Unknown
Berkeley	2	2	2	2	2	0	0	0	2
Cabell	1	1	1	1	1	0	0	0	1
Fayette	1	1	1	1	1	0	0	1	0
Harrison	1	1	1	1	0	0	0	0	1
Marshall	3	3	2	3	3	1	1	0	1
Mercer	2	2	2	2	2	0	0	0	2
Nicholas	3	3	2	3	3	1	0	1	1
Pocahontas	1	1	1	1	1	0	1	0	0
Raleigh	5	5	5	5	5	0	2	3	0
Summers	1	1	0	1	1	0	0	0	1
Tyler	1	1	1	1	1	0	0	1	0
Webster	1	1	1	1	1	0	1	0	0
Total	22	22	19	22	21	2	5	6	9
Percent	100%	100%	86%	100%	95%	9%	23%	27%	41%

Table XXII
Hepatitis C Surveillance Assessment Data, West Virginia, 2002

County	Total Cases	Patient Information		Time from onset to date of report to LHD		
		Complete Demographic Information	Complete Risk Factor Information	≤7 Days	8-14 Days	> 14 Days
Harrison	1	1	1	0	1	0
Fayette	1	1	1	0	1	0
Raleigh	1	1	1	1	0	0
Total	3	3	3	1	2	0
Percent	100%	100%	100%	33%	67%	0%