

West Virginia Vectorborne Disease Surveillance Report



JANUARY 1 – NOVEMBER 23, 2016

The purpose of this report is to share descriptive surveillance data related to vectorborne disease activity with public health partners in West Virginia (WV). All information in this report is considered provisional. For questions or comments, contact Miguella Mark-Carew in the Division of Infectious Disease Epidemiology (DIDE) at miguella.p.mark-carew@wv.gov.

MOSQUITOES HUMAN SURVEILLANCE

During the period of January 1 to November 23, 2016, a total of 21 human cases of mosquito-borne disease were reported: eleven travel-associated Zika virus disease cases, eight La Crosse encephalitis cases, one travel-associated malaria case, and one West Nile Virus case (Table 1).

Table 1. Summary of human cases of mosquito-borne diseases for the current reporting period in WV.

Mosquito-borne Disease	# Confirmed and Probable Human Cases ^a Total through November 23, 2016	Comments
Zika virus disease	11	All cases were travel-associated
Malaria	1	Case traveled to Cameroon
La Crosse encephalitis	8	From Fayette, Kanawha, Mason, Mercer, Nicholas, Summers, Webster counties
West Nile Virus	1	From Berkeley county
Total	21	

^aTable includes only confirmed and probable cases that have been reviewed and closed by the Zoonotic Disease Epidemiologist.

BIRD AND HORSE SURVEILLANCE

During the period of January 1 to October 12, 2016, the Office of Laboratory Services received 6 birds for arboviral disease testing; 3 birds were unsatisfactory for testing. One bird was negative for arboviral disease; test results for the other dead bird are pending. One horse from Mineral County tested positive for West Nile virus (WNV).

Table 2. Summary of dead birds and horses (serum) specimens submitted for testing through September 14, 2016.

Type of Specimen	Total through October 12, 2016				Comments
	# Specimens Tested	+ Arbovirus ^a			
		WNV	SLE	EEE	
Dead bird	3	0	0	0	One specimen was negative; two pending
Horse serum	1	1	0	0	Horse was from Mineral County

MOSQUITO SURVEILLANCE

During the period of May 24 to October 12, 2016, 70 localities in the following 24 counties have served as adult mosquito surveillance sites (Fig. 1). Eleven total mosquito pools tested positive for WNV during this time period: two *Culex* mosquito pools collected on July 6 and August 17 from the same site in Cabell County; four *Culex* mosquito pools collected from three localities in Kanawha County on August 23, September 2, September 19 and September 22; a *Culex* mosquito pool collected from Nicholas County on August 16; a *Culex* mosquito pool collected on August 28 from Mason County; and three *Culex* mosquito pools collected from the same locality in Wayne County on September 4 (Table 3). *Aedes albopictus*, the mosquito that transmits Zika virus, dengue virus, chikungunya virus, and La Crosse virus, has been identified in 19 West Virginia counties this year (Fig. 2).

Table 3. Testing summary of adult mosquito pools through October 12, 2016.

Mosquito Species	Total through October 12, 2016					Comments
	# Pools Tested	+ Arbovirus-positive pools				
		WNV	LAC	SLE	EEE	
<i>Culex</i> spp.	291	11	-	-	-	WNV positive pools in Cabell, Kanawha, Mason Nicholas, and Wayne counties
Non- <i>Culex</i> spp.	104	-	-	-	-	
Total	395	11	-	-	-	

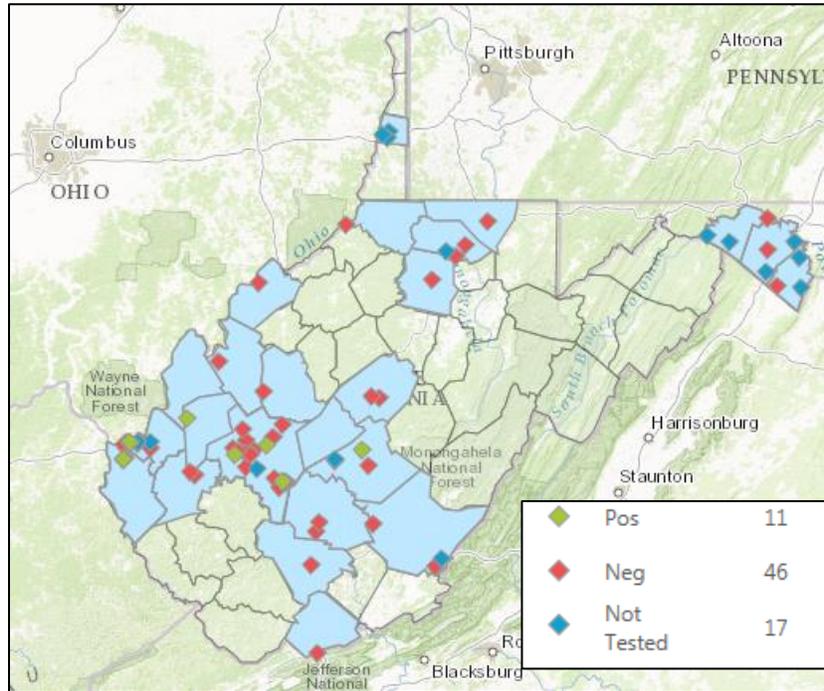


Figure 1. Active mosquito surveillance sites through October 12, 2016. Mosquitoes have been collected and identified from 24 counties. Mosquitoes from 22 counties have been tested for arbovirus. A total of 11 pools tested positive for WNV. Mason and Nicholas counties each had one WNV positive pool. Cabell County had two WNV positive mosquito pools. Three WNV positive pools were collected from Wayne County and four WNV positive mosquito pools were collected from Kanawha County.

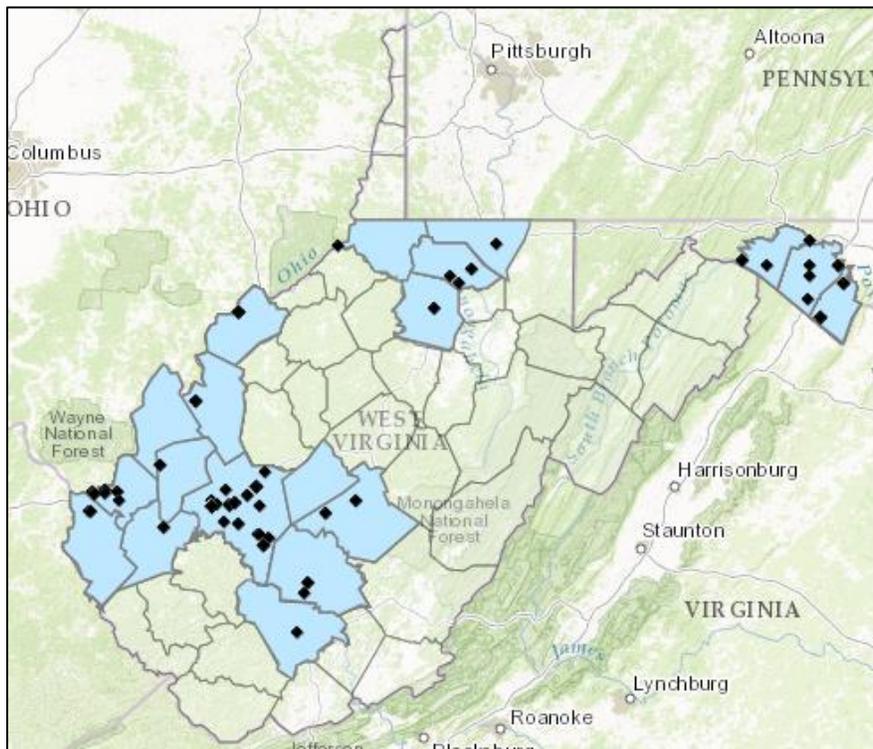


Figure 2. Distribution of *Aedes albopictus* identified through mosquito surveillance (shown as black diamonds). *Aedes albopictus* has been identified in 19 counties to date: Berkeley, Cabell, Clay, Fayette, Harrison, Jackson, Jefferson, Kanawha, Lincoln, Marion, Mason, Monongalia, Morgan, Nicholas, Putnam, Raleigh, Wayne, Wetzel, and Wood.

TICKS

HUMAN SURVEILLANCE

Through November 23, 2016, 339 confirmed and probable cases of tickborne diseases (TBDs) were reported in West Virginia. The majority of cases (94.3%) were Lyme disease cases (n=320) (Table 4 and Fig. 3); endemic counties in the eastern part of the state accounted for most Lyme disease cases. Spotted fever group rickettsioses (SFGRs) (n=13), ehrlichiosis (n=5) and Q fever (n=1) cases were also reported (Table 4 and Fig. 4). Forty-five (81.8%) of West Virginia's 55 counties have reported human TBD activity.

Table 4. Summary of reported human cases of tickborne diseases (TBDs) through November 23, 2016.

Tickborne Disease ^a	# Confirmed or Probable Cases through November 23, 2016	# of Counties Where Disease Reported
Ehrlichiosis	5	4
Lyme disease	320	42
Spotted fever group rickettsioses ^b	13	10
Q fever	1	1
TOTAL	339	45 counties reported TBD

^aTable includes only confirmed or probable cases that have been reviewed and closed by Zoonotic Disease Epidemiologist.

^bIncludes Rocky Mountain spotted fever

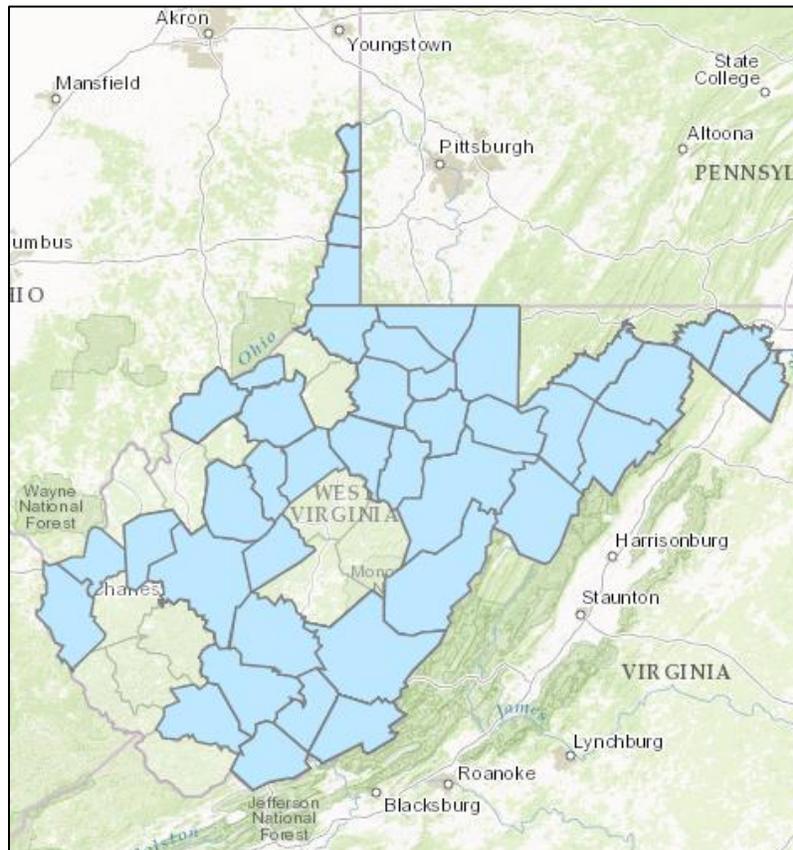


Figure 3. County distribution of confirmed and probable Lyme disease cases (N=320) through November 23, 2016, West Virginia. Counties with at least one reported Lyme disease case are shown in blue.

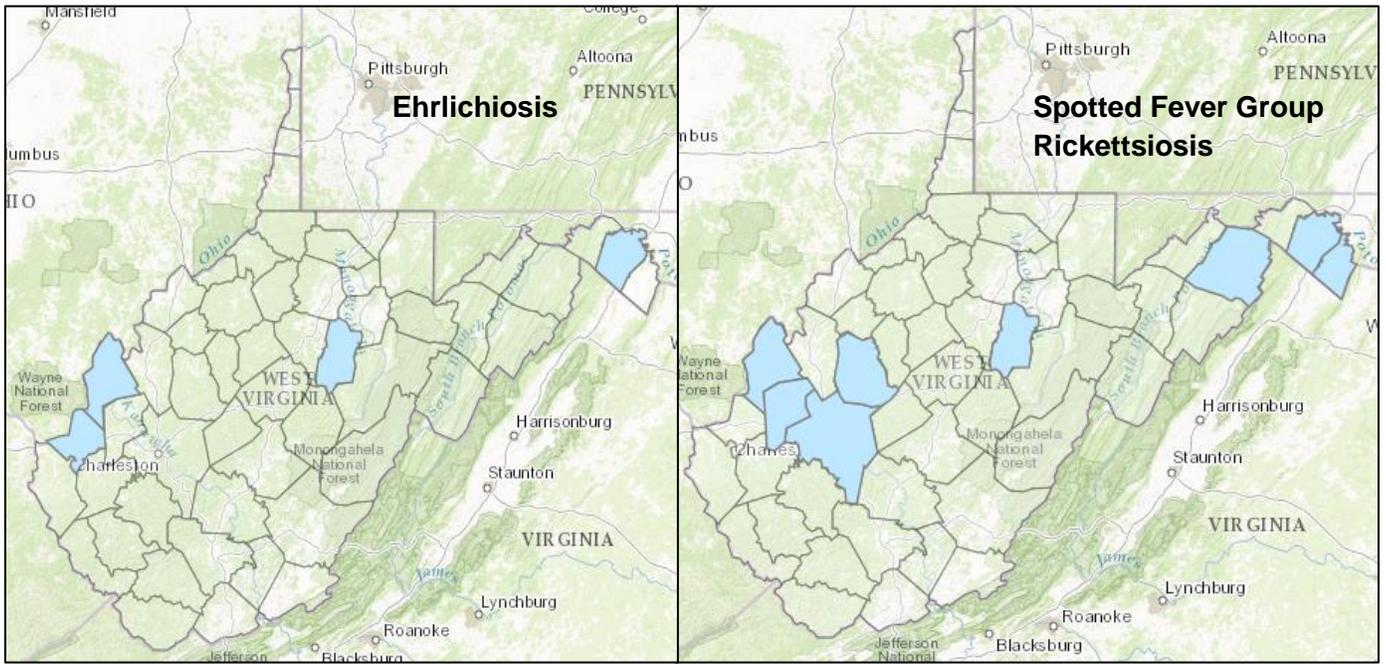


Figure 4. County distribution of ehrlichiosis (n=5) and SFGRs (n=13) cases through November 23, 2016, 2016, West Virginia. Counties shown in blue indicate where cases have been reported. SFGRs cases were reported in Berkeley, Hampshire, Jefferson, Kanawha, Mason, Putnam, Roane, Upshur, and Wayne counties; ehrlichiosis cases were reported in Berkeley, Cabell, Mason, and Upshur counties.

VETERINARY TICK SURVEILLANCE

Veterinarians from 42 veterinary practices have submitted 1,197 ticks from animals for identification through October 25, 2016 (based on date of collection) (Table 5). Ticks have been active in every month, including winter months of January and February. Seven species have been identified: *Amblyomma americanum*, *Amblyomma maculatum*, *Dermacentor variabilis*, *Haemaphysalis leporispalustris*, *Ixodes cookei*, *Ixodes scapularis*, and *Rhipicephalus sanguineus*. The majority of ticks (60.4%) were identified as *D. variabilis*.

Table 5. West Virginia Veterinary Tick Surveillance Project (WVVTSP) tick identification results through October 25, 2016.

Tick Species	# of Ticks Submitted and Identified
<i>A. americanum</i>	109
<i>A. maculatum</i>	1
<i>D. variabilis</i>	723
<i>H. leporispalustris</i>	3
<i>I. cookei</i>	27
<i>I. scapularis</i>	171
<i>Ixodes spp.</i>	44
<i>R. sanguineus</i>	119
Total	1,197

Ticks ID results by veterinary practice and tick distribution results by county can be viewed at: <http://arcg.is/1V3Ob5A> or on the West Virginia Veterinary Tick Submission Project page at: <http://www.dhhr.wv.gov/oeps/disease/zoonosis/tick/pages/wv-veterinary-tick-submission-project.aspx>.

Thanks to public health partners who contribute to vectorborne disease surveillance activities. A special thanks to the West Virginia Office of Laboratory Services for testing almost 400 mosquito pools, WVVTSP participating veterinarians, and the following local health departments that participated in 2016 mosquito surveillance: Berkeley, Braxton, Cabell-Huntington, Kanawha, Marion, and Wheeling-Ohio. For more information, visit: <http://www.dhhr.wv.gov/oeps/disease/Zoonosis/Pages/default.aspx>.

**CUMULATIVE HUMAN VECTORBORNE DISEASE SURVEILLANCE SUMMARY, WEST VIRGINIA
(January 1– November 23, 2016)**

County	MOSQUITO-BORNE					TICKBORNE					
	LAC	WNV	CHIK	DF	Malaria	Anaplasmosis	Ehrlichiosis	Lyme disease	RMSF	Q fever	Tularemia
Barbour								5			
Berkeley		1					1	45	2		
Boone											
Braxton											
Brooke								4			
Cabell							1	1			
Calhoun								1			
Clay								2			
Doddridge											
Fayette	2							2			
Gilmer								1			
Grant								2			
Greenbrier								7			
Hampshire								33	2		
Hancock								24			
Hardy								3			
Harrison								6			
Jackson											
Jefferson								29	2		
Kanawha	1							12	1		
Lewis								3			
Lincoln											
Logan											
McDowell											
Marion								6			
Marshall								2			
Mason	1				1		2		1		
Mercer	1							5			
Mineral								20			
Mingo											
Monongalia								12			
Monroe								9			
Morgan								23			
Nicholas	1										
Ohio								5			
Pendleton								3			
Pleasants								1			
Pocahontas								2			
Preston								4			
Putnam								2	1		
Raleigh								5			
Randolph								2			
Ritchie								4			
Roane								3	1		
Summers	1							2			
Taylor								5			
Tucker								1			
Tyler											
Upshur							1	4	2		
Wayne								3	1		
Webster	1										
Wetzel								6			
Wirt										1	
Wood								10			
Wyoming								1			
TOTAL	8	1	0	0	1	0	5	320	13	1	0

*Table includes only confirmed or probable cases that have been reviewed and closed by the Zoonotic Disease Program. Zika virus disease cases will not be reported at the county level.

LAC = La Crosse encephalitis WNV= West Nile virus CHIK= chikungunya DF= dengue fever
RMSF= Spotted fever group rickettsioses including Rocky Mountain spotted fever