



Vector Borne Disease 2019 Surveillance Report

Summit County Public Health



Report Weeks 13 and 14 (August 18 to August 31, 2019)
MMWR Weeks 34 and 35

Public Health
Prevent. Promote. Protect.

This report will be issued from June through October of each year (or later if West Nile Virus disease is still a concern). Surveillance will include human and veterinary cases and testing of mosquito pools in Summit County. It will also include updates from Ohio and around the nation. It will include vector-borne diseases besides West Nile Virus.

SUMMIT COUNTY SURVEILLANCE

Table 1: West Nile virus (WNV) tests ordered in Summit County hospitals

Week(s)	# of WNV tests ordered this period	# of positive WNV tests this period	Cumulative # of tests ordered this season	Cumulative # of positive tests this season	Percentage of positive tests
Weeks 1 & 2: 5/26 to 6/8	2	1	2	1	50.0%
Weeks 3 & 4: 6/9 to 6/22	5	0	7	1	14.3%
Weeks 5 & 6: 6/23 to 7/6	4	0	11	1	9.1%
Weeks 7 & 8: 7/7 to 7/20	6	1	17	2	11.8%
Weeks 9 & 10: 7/21 to 8/3	9	1	26	3	11.5%
Weeks 11 & 12: 8/4 to 8/17	10	0	36	3	8.3%
Weeks 13 & 14: 8/18 to 8/30	14	1	50	4	8.0%
Weeks 15 & 16: 9/1 to 9/14					
Weeks 17 & 18: 9/15 to 9/28					
Weeks 19 & 20: 9/29 to 10/12					
Weeks 21 & 22: 10/13 to 10/26					

Note: Reporting may not be completed each week. Numbers will be updated when reports are received

West Nile virus testing (Table 1): During surveillance period Weeks 13 and 14, there were 14 tests for West Nile virus (stand alone or part of an arbovirus panel) ordered by Summit County hospitals. So far this season, there have been four positive results, all of which were likely to be due to a past exposure and were not active infections (Table 1).

Lyme disease testing (Table 2): There were 65 diagnostic test series performed for Lyme disease during Weeks 13 and 14, 8 of which were positive. The CDC currently recommends a two-step process when testing blood for evidence of antibodies against the Lyme disease bacteria (*Borrelia burgdorferi*). Both steps can be done using the same blood sample. The first step uses a testing procedure called "EIA" (enzyme immunoassay) or rarely, an "IFA" (indirect immunofluorescence assay). If this first step is negative, no further testing of the specimen is recommended. If the first step is positive or indeterminate (sometimes called "equivocal"), then the second step should be performed. The second step uses a test called an immunoblot test, commonly, a "Western blot" test. Results are considered positive only if the EIA/IFA and the immunoblot are both positive.

Week(s)	# of Lyme tests ordered this period	# of positive Lyme tests this period	Cumulative # of tests ordered this season	Cumulative # of positive tests this season	Percentage of positive tests
Weeks 1 & 2: 5/26 to 6/8	55	2	55	2	3.6%
Weeks 3 & 4: 6/9 to 6/22	79	10	134	12	9.0%
Weeks 5 & 6: 6/23 to 7/6	59	6	193	18	9.3%
Weeks 7 & 8: 7/7 to 7/20	80	5	273	23	8.4%
Weeks 9 & 10: 7/21 to 8/3	82	12	355	35	9.9%
Weeks 11 & 12: 8/4 to 8/17	69	6	424	41	9.7%
Weeks 13 & 14: 8/18 to 8/30	65	8	489	49	10.0%
Weeks 15 & 16: 9/1 to 9/14					
Weeks 17 & 18: 9/15 to 9/28					
Weeks 19 & 20: 9/29 to 10/12					
Weeks 21 & 22: 10/13 to 10/26					

Note: Reporting may not be completed each week. Numbers will be updated when reports are received

Reported Vector-borne diseases in 2019 (Table 3): As of August 17, there were 18 reported cases of Lyme disease; 6 were confirmed by laboratory testing and 12 were suspected cases. Two confirmed cases of malaria and two cases of Rocky Mountain spotted fever were also reported.

	Confirmed	Suspected or Probable	Notes
Tick-borne diseases:			
Babesiosis	0	0	
Ehrlichiosis / anaplasmosis	0	0	
Lyme disease	6	16	
Powassan virus disease	0	0	
Rocky Mountain spotted fever	1	1	
Mosquito-borne diseases:			
Chikungunya	0	0	
Dengue	0	0	
Eastern equine encephalitis	0	0	
LaCrosse virus disease	0	0	
Malaria	2	0	Cases were international travel-related
St. Louis encephalitis virus disease	0	0	
Zika virus infection	0	0	
West Nile virus infection	0	0	

Source: Ohio Disease Reporting System (ODRS); only confirmed, probable, and suspected cases are included.

Species name	Diseases associated	# identified
Mosquito species		
<i>Aedes albopictus</i>	Chikungunya, dengue fever, yellow fever	3
<i>Aedes triseriatus</i>	La Crosse encephalitis	508
Tick species		
<i>Ixodes scapularis</i>	Lyme disease, babesiosis, anaplasmosis	81

Source: Ohio Department of Health (Identification via mailed specimens, emailed photos and iNaturalist observations)

Table 5. Reported Aseptic/viral Meningitis Cases in Summit County (confirmed & probable), as of August 31, 2019

Week(s)	Cases reported this period	Cumulative cases for the season
Aseptic meningitis cases reported prior to season (1/1 to 5/25/2019)	3	-
Weeks 1 & 2: 5/26 to 6/8	1	1
Weeks 3 & 4: 6/9 to 6/22	2	3
Weeks 5 & 6: 6/23 to 7/6	2	5
Weeks 7 & 8: 7/7 to 7/20	3	8
Weeks 9 & 10: 7/21 to 8/3	2	10
Weeks 11 & 12: 8/4 to 8/17	3	13
Weeks 13 & 14: 8/18 to 8/30	2	15
Weeks 15 & 16: 9/1 to 9/14		
Weeks 17 & 18: 9/15 to 9/28		
Weeks 19 & 20: 9/29 to 10/12		
Weeks 21 & 22: 10/13 to 10/26		

Source: Ohio Disease Reporting System (ODRS)

Reported aseptic/viral meningitis cases (Table 5): Prior to the reporting season, there were 3 reported cases of aseptic meningitis, and 2 cases were reported during Weeks 13 and 14. Aseptic/viral meningitis is the most common type of meningitis and occurs predominately in the summer and fall. While most aseptic/viral meningitis cases are due to gastrointestinal or respiratory viruses, similar symptoms may be present with arthropod-borne diseases.

Mosquito testing (Table 6): Based on the ODH mosquito testing summary released on September 5, over 89,659 mosquitoes were collected as 2,272 pooled samples throughout Summit County. 36 of the pooled samples tested positive for West Nile virus.

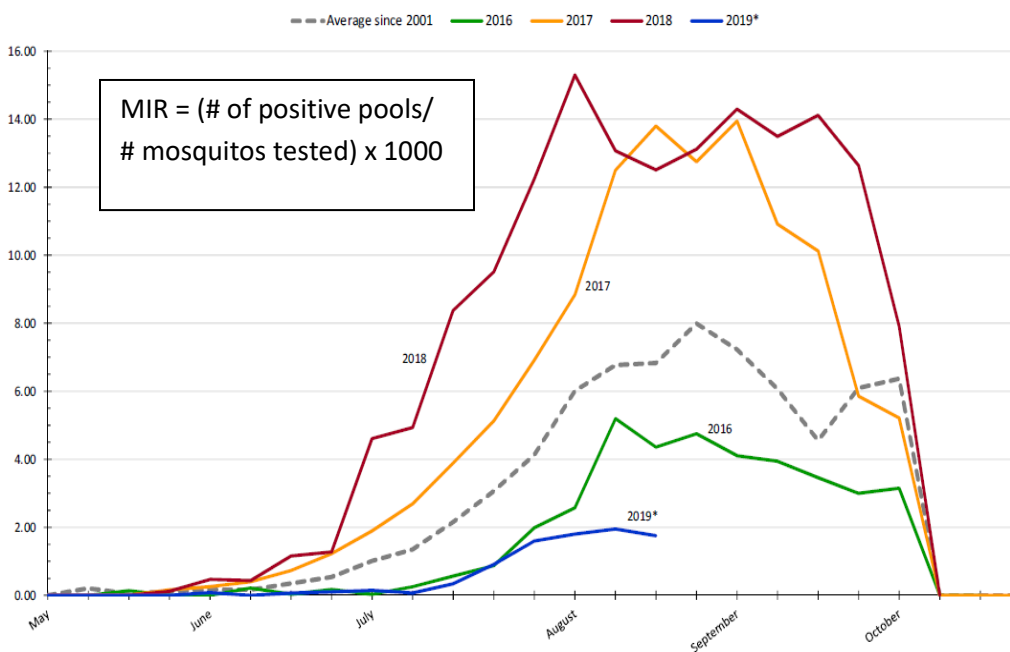
Table 6. Mosquito Testing in Summit County (samples processed by noon on 9/5/2019)

Mosquitoes identified	89,659
Pooled samples tested	2,272
Positive WNV pooled samples	36

Note: All mosquitoes pools tested were *Culex sp.*

OHIO SURVEILLANCE

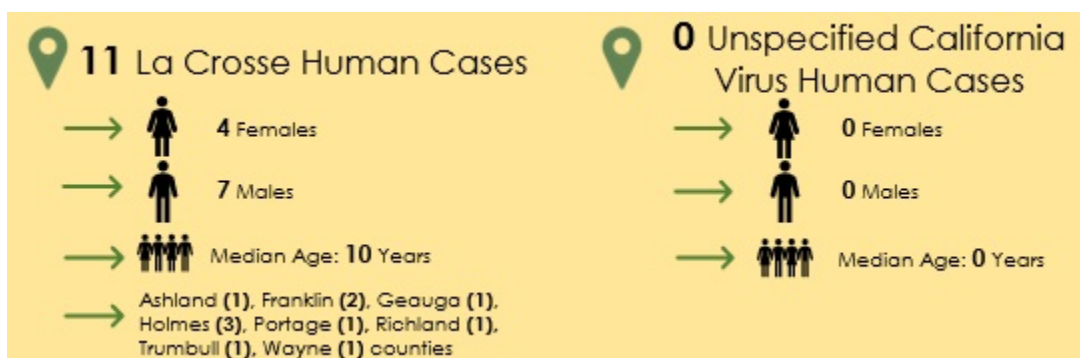
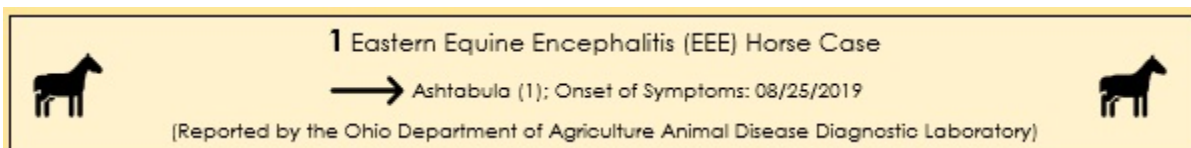
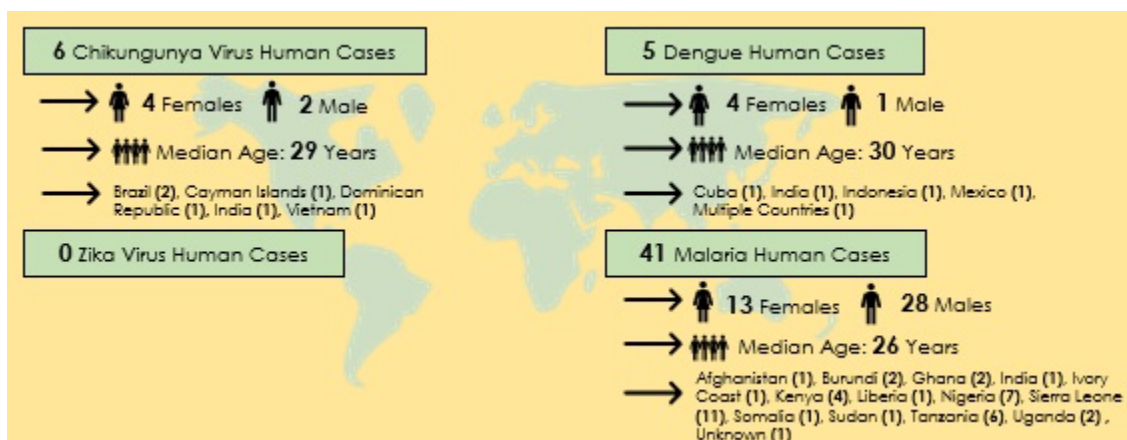
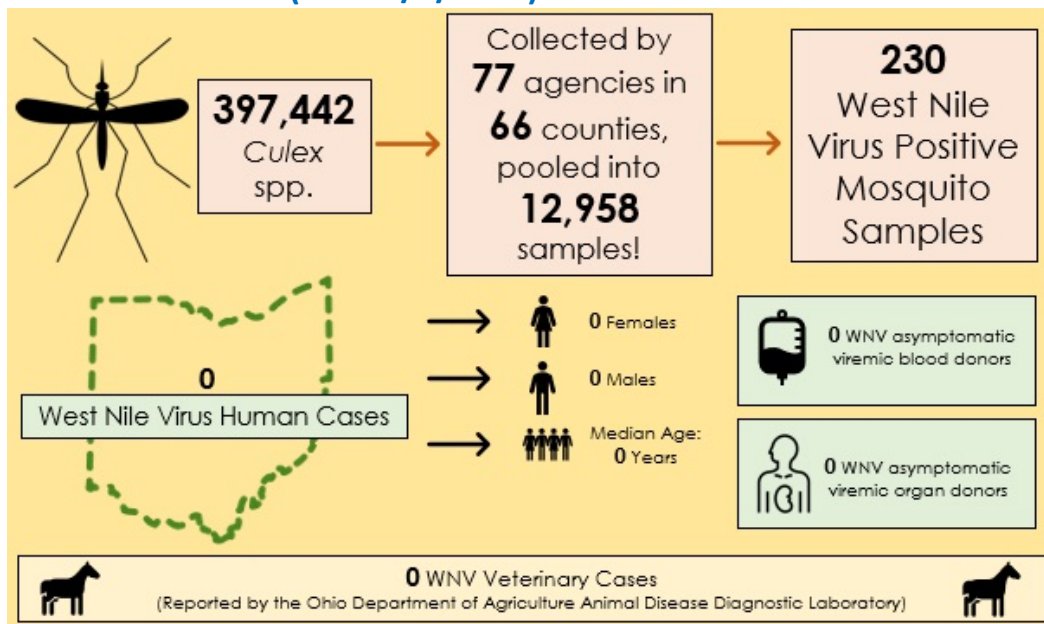
Figure 1. Minimum infection rate (MIR) of West Nile Virus in *Culex spp.* collected in Ohio as of 8/29/2019



Source: Ohio Department of Health

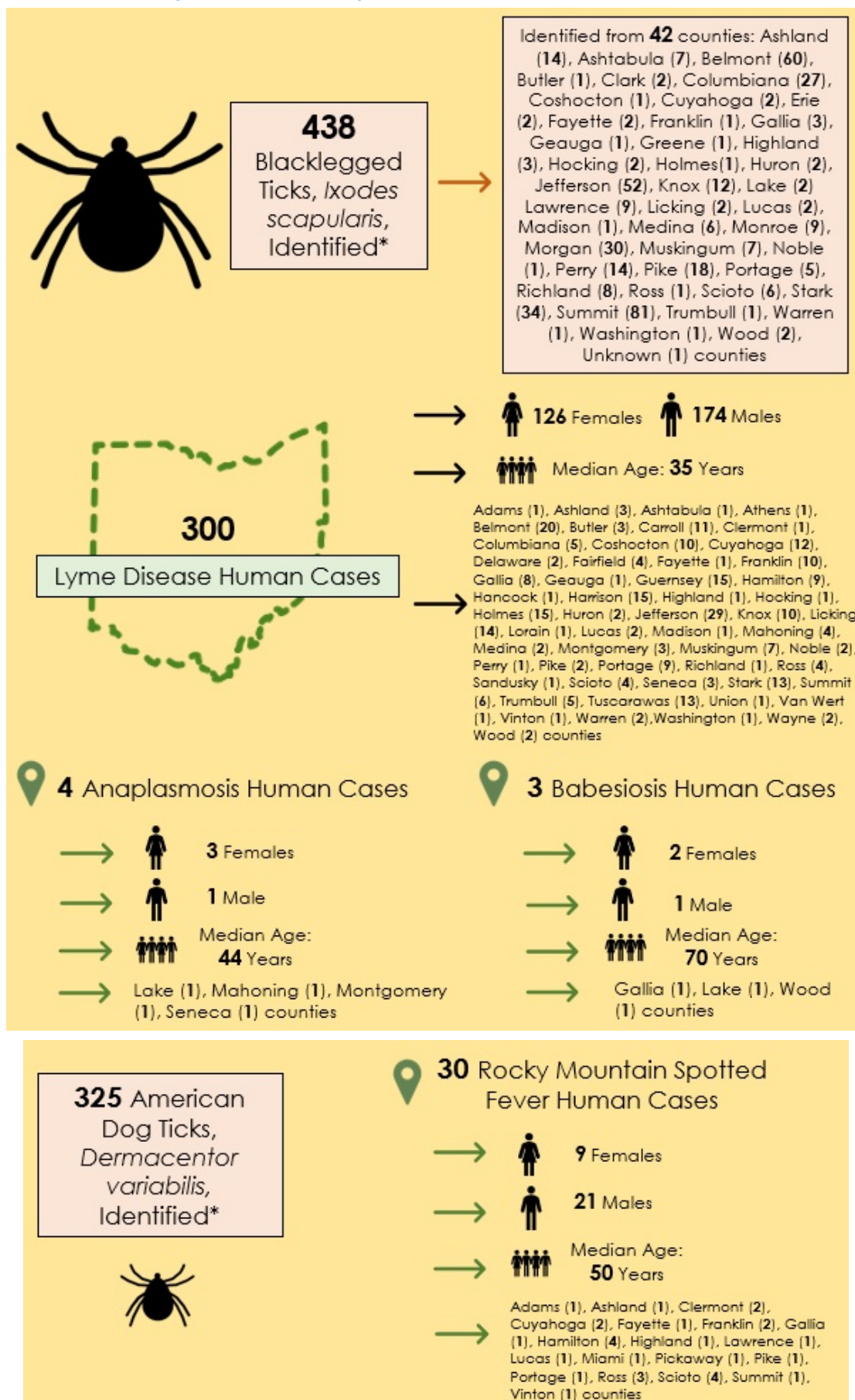
Although the high amounts of rainfall in early summer have resulted in increased mosquito breeding, West Nile virus infection rates remain below average in Ohio (Figure 1). A small increase in the MIR occurred in late July, but it remains well below the MIR at this time in 2018. 230 mosquito pools in Ohio tested positive for West Nile virus, including 36 pools in Summit County. At this time in 2018, Summit County had 602 mosquito pools that tested positive for West Nile virus.

Ohio Mosquito-borne diseases (as of 9/5/2019):



Special note for travelers: Ohioans traveling to areas where local transmission is occurring should be aware of the ongoing situation and make every effort to avoid mosquito and tick bites. Additional information can be found from the [Centers for Disease Control and Prevention \(CDC\)'s Travelers' Health](#) and [Pan-American Health Organization](#) websites.

Ohio Tick-borne diseases (as of 9/5/2019):





Source: [Ohio Department of Health Vector Borne Disease Updates](#)

OHIO AND UNITED STATES SURVEILLANCE

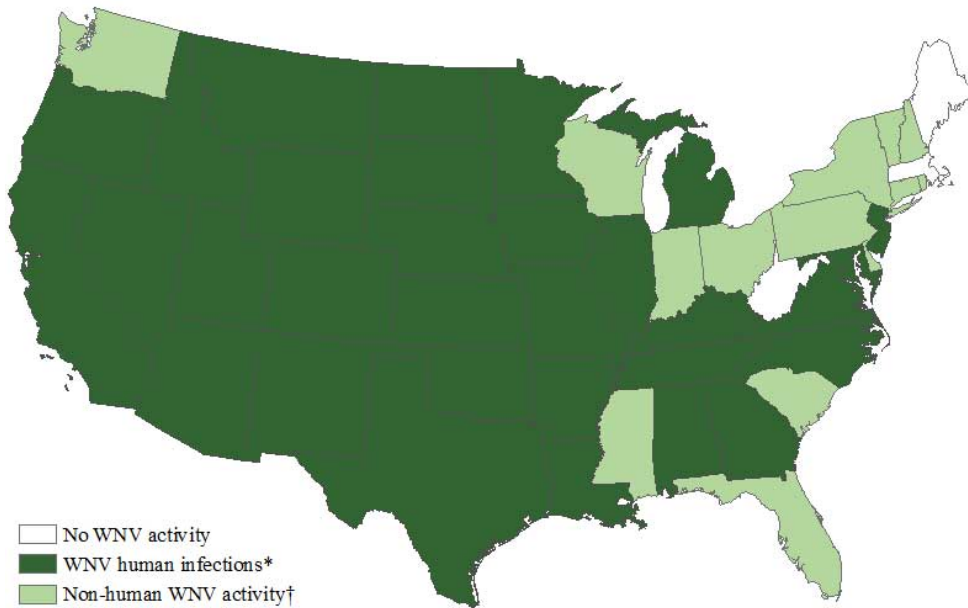
Table 7. Reported Vector Borne disease in Ohio and the United States, 2019

Disease	OHIO	UNITED STATES	
	2019 (as of 8/31) cumulative	Weeks 13 and 14 (8/18 to 8/31)	2019 (as of 8/31) Cumulative
Babesiosis	5	72	1296
Chikungunya	8	0	57
Dengue (includes dengue-like illness)	6	11	414
Eastern equine encephalitis	0	1	8
Ehrlichiosis / anaplasmosis	25	157	4755
Jamestown Canyon virus disease	0	0	9
LaCrosse virus disease	6	2	15
Lyme Disease	465	Not reported weekly by CDC	
Malaria	39	36	932
Powassan virus disease	0	0	17
Spotted fever rickettsiosis	53	81	2627
St. Louis encephalitis virus disease	0	0	7
West Nile virus infection	0	6	208
Zika virus infection, non-congenital	0	0	7

Note: Data is provisional and subject to change

Source: https://wonder.cdc.gov/nndss/nndss_weekly_tables_menu.asp

Figure 2. West Nile virus activity by state – United States, 2019 (as of September 4, 2019)



WNV infections in mosquitoes, birds, sentinel animals, or veterinary animals have been reported to CDC ArboNET from all 48 contiguous states except: Maine, Massachusetts, and West Virginia.

West Nile virus infections in humans have been reported to CDC ArboNET from the following states: Alabama, Arizona, Arkansas, California, Colorado, District of Columbia, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Utah, Virginia, and Wyoming.

Source: <https://www.cdc.gov/westnile/statsmaps/preliminarymapsdata2019/activitybystate2019.html>

VECTOR BORNE DISEASE NEWS

Graphene-based fabric shows promise as shield from mosquito bites

A graphene-based clothing layer could help shield people from mosquito bites, according to a study yesterday in *Proceedings of the National Academy of Sciences*. "Graphene-based materials are being developed for a variety of wearable technologies to provide advanced functions that include sensing; temperature regulation; chemical, mechanical, or radiative protection; or energy storage," the study authors, from Brown University wrote. "We hypothesized that graphene films may also offer an additional unanticipated function: mosquito bite protection for light, fiber-based fabrics."

Through a combination of experiments involving live *Aedes aegypti* mosquitoes, needle penetration force measurements, and mathematical modeling of mechanical puncture phenomena, the investigators that multilayer graphene films completely inhibited biting by preventing mosquitoes from sensing skin- or sweat-associated chemicals used to locate blood meals. The insects landed much less frequently on graphene than on bare skin. The graphene layer also prevented mosquitoes from penetrating their fascicle, or feeding apparatus, into the skin, except when the fabric was wet. The study was funded by the National Institute of Environmental Health Sciences (NIEHS), part of the US National Institutes of Health.

"These findings could lead to new protective methods against mosquitoes, without the environmental or human health effects of other chemical-based repellants," said Heather Henry, PhD, a health scientist administrator with the NIEHS Superfund Research Program, in a NIEHS news release. William Suk, PhD, director of the NIEHS Superfund Research Program, said, "New material such as this one should be assessed in the field to determine full public health implications."

Aug 26 *Proc Natl Acad Sci* [abstract](#)

Aug 26 NIEHS [news release](#)

Source: <http://www.cidrap.umn.edu/news-perspective/2019/08/news-scan-aug-27-2019>

About this report: Reporting agencies include Summit County hospital laboratories and the Ohio Department of Health. Vector-borne disease case data for Summit County are obtained from the Ohio Disease Reporting System.

Many thanks to all agencies who report vector-borne disease data weekly.

Reporting from participants may not be complete each week. Numbers may change as updated reports are received. For questions, please contact Joan Hall (jhall@sched.org) or Tracy Rodriguez (trodriguez@sched.org), Summit County Public Health Communicable Disease Unit (330-375-2662). This report was issued on **September 6, 2019**.