Vector Borne Disease
2019 Surveillance Report

Summit County Public Health

Report Weeks 19 and 20 (September 29 to October 12, 2019)
MMWR Weeks 40 and 41

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 for all reportable diseases that are transmitted insect vectors.

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	12	1	62	5	8.1%
Weeks 17 & 18: 9/15 to 9/28	14	0	76	5	6.6%
Weeks 19 & 20: 9/29 to 10/12	11	0	87	5	5.8%
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 19 and 20, there were 11 tests for West Nile virus (stand alone or part of an arbovirus panel) ordered by Summit County hospitals, none were positive. So far this season, there have been 5 positive results, all of which were likely to be indication of immunity due to a past exposure and were not active infections (Table 1).

Lyme disease testing (Table 2): There were 59 diagnostic test series performed for Lyme disease during Weeks 19 and 20, 5 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.

Table 2. Lyme disease tests ordered in Summit County hospitals					
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	**84**	**5**	**277**	**23**	**8.3%**
Weeks 9 & 10: 7/21 to 8/3	**82**	**12**	**359**	**35**	**9.8%**
Weeks 11 & 12: 8/4 to 8/17	**69**	**7**	**428**	**42**	**9.8%**
Weeks 13 & 14: 8/18 to 8/30	**65**	**8**	**493**	**50**	**10.1%**
Weeks 15 & 16: 9/1 to 9/14	**64**	**5**	**557**	**55**	**9.9%**
Weeks 17 & 18: 9/15 to 9/28	**60**	**9**	**617**	**64**	**10.4%**
Weeks 19 & 20: 9/29 to 10/12	**59**	**5**	**676**	**69**	**10.2%**
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 October 12, there were 23 reported cases of Lyme disease; 9 were confirmed by laboratory testing and 14 were suspected cases. Two confirmed cases of malaria, three cases of Rocky Mountain spotted fever, and two cases of ehrlichiosis were also reported.

Table 3: Vector-borne diseases reported for Summit County residents, 2019 cumulative totals (as of October 12, 2019)			
	Confirmed or Probable	**Suspected**	**Notes**
Tick-borne diseases:			
Babesiosis	0	0	
Erhlichiosis / anaplasmosis	0	**2**	
Lyme disease	**9**	**14**	
Powassan virus disease	0	0	
Rocky Mountain spotted fever	**1**	**2**	
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.			

Table 4. Notable mosquito and tick species identifications in Summit County (as of October 18, 2019)		
Species name	**Diseases associated**	**# identified**
Mosquito species		
Aedes albopictus	Chikungunya, dengue fever, yellow fever	3
Aedes triseriatus	La Crosse encephalitis	532
Tick species		
Ixodes scapularis	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 October 12, 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	**0**	**13**
Weeks 15 & 16: 9/1 to 9/14	**0**	**13**
Weeks 17 & 18: 9/15 to 9/28	**2**	**15**
Weeks 19 & 20: 9/29 to 10/12	**0**	**15**
Weeks 21 & 22: 10/13 to 10/26		
Source: Ohio Disease Reporting System (ODRS)		

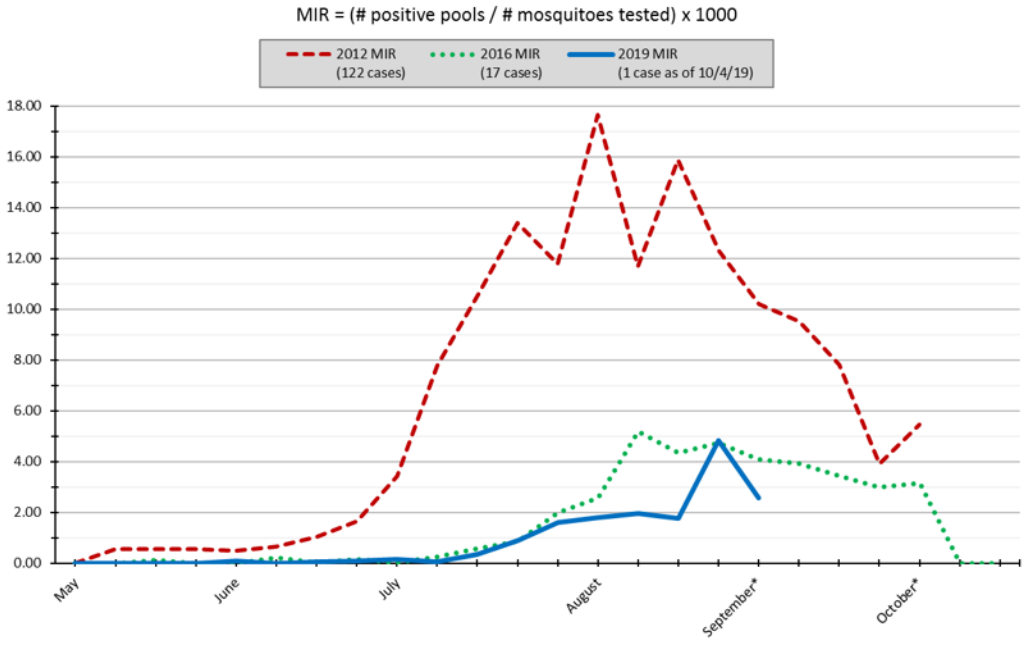
Reported aseptic/viral meningitis cases (Table 5): Prior to the reporting season, there were three reported cases of aseptic meningitis, and no cases were reported during Weeks 19 and 20, keeping the season total at 15. Aseptic/viral meningitis is the most common type of meningitis and occurs predominately 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 October 18, over 91,468 mosquitoes were collected as 2,317 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 10/18/2019*)	
Mosquitoes identified	91,468
Pooled samples tested	2,317
Positive WNV pooled samples	36
Note: All mosquitoes pools tested were *Culex sp.*	

OHIO SURVEILLANCE

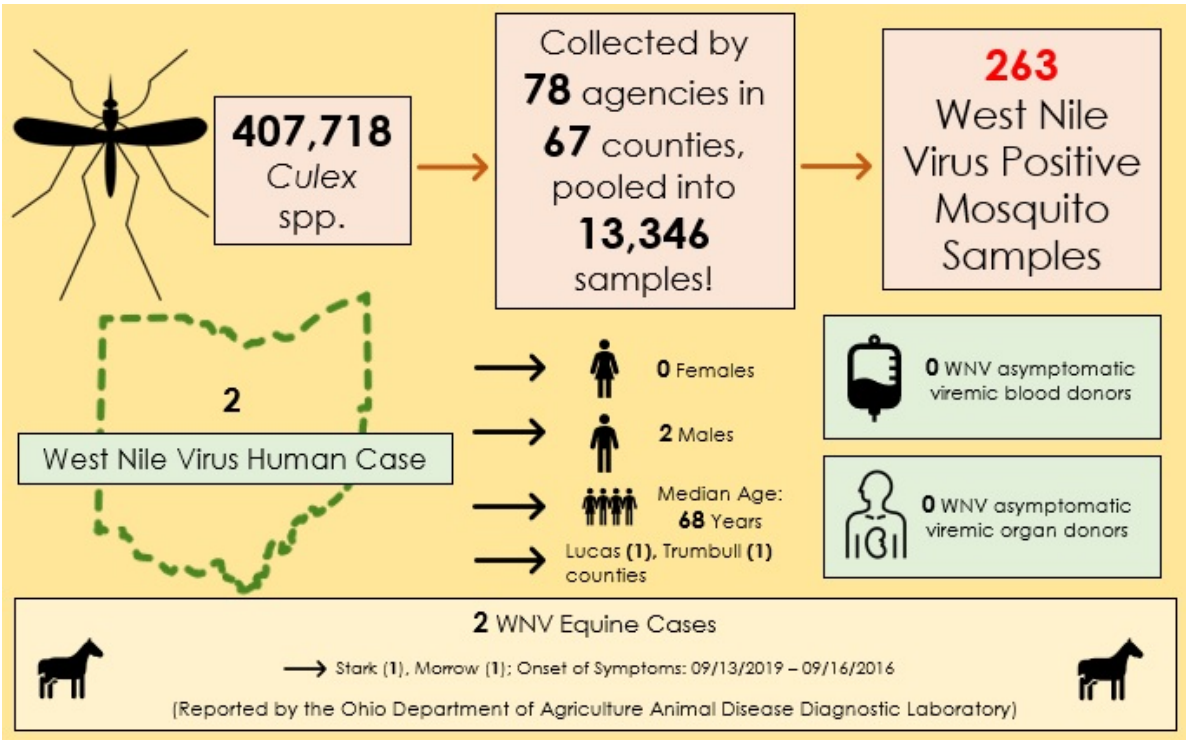
Figure 1. Minimum infection rate (MIR) of West Nile Virus in *Culex spp.* collected in Ohio as of 10/18/2019

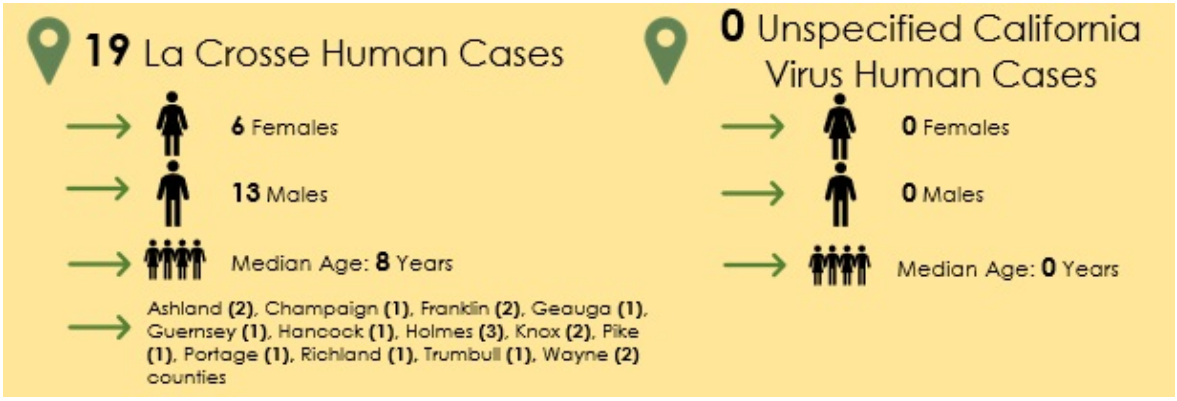


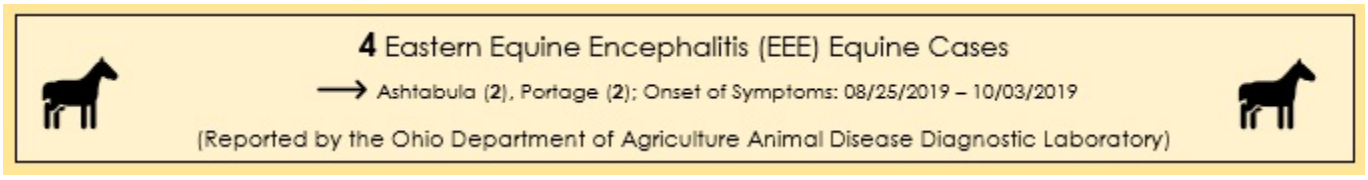
West Nile virus infection rates peaked at 4.81 in late August, but remained below average in Ohio (Figure 1). *Routine testing of mosquitoes in Ohio officially ended on September 7, but mosquitos suspected of being positive will be tested until the end of the season.* 263 mosquito pools in Ohio tested positive for West Nile virus, including 36 pools in Summit County. At this time in 2018, Summit County had 646 mosquito pools that tested positive for West Nile virus.

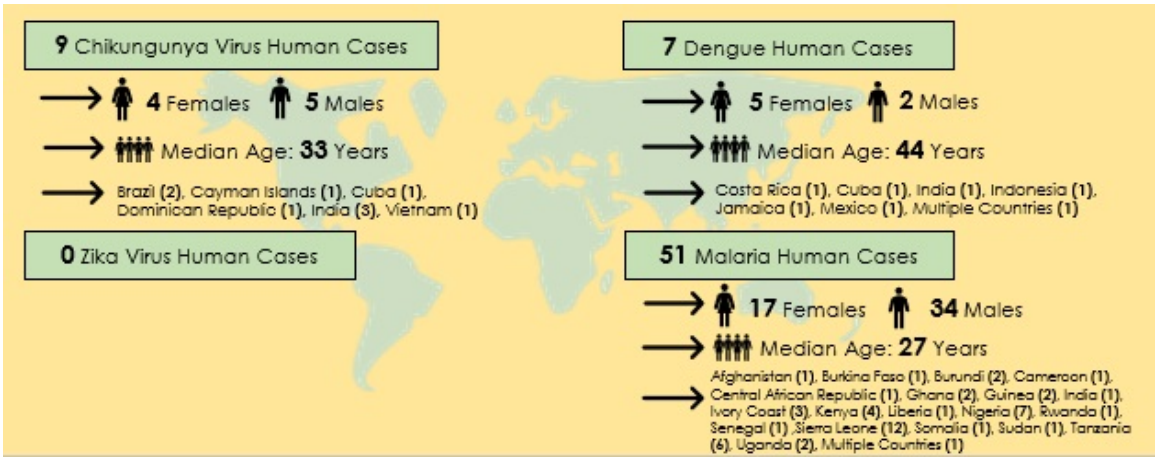
Source: Ohio Department of Health

Ohio Mosquito-borne diseases (as of 10/17/2019):

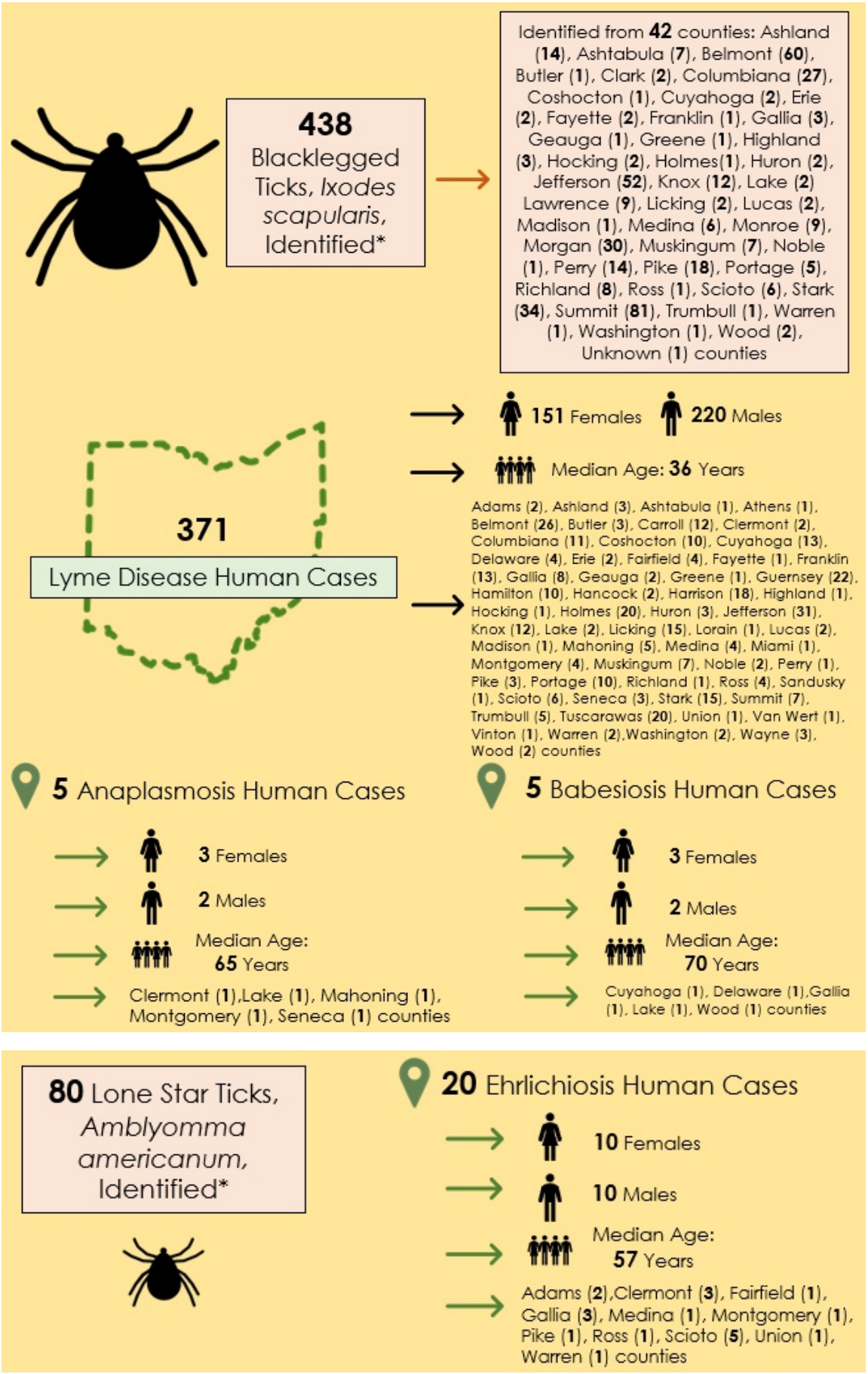


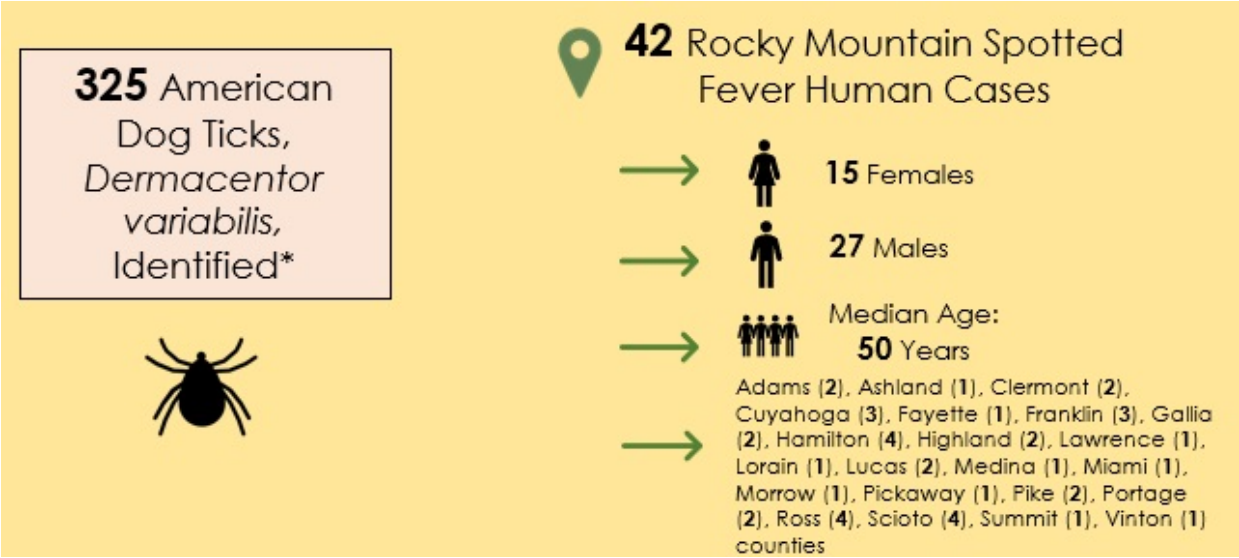






Ohio Tick-borne diseases (as of 10/17/2019):





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

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 AND UNITED STATES SURVEILLANCE

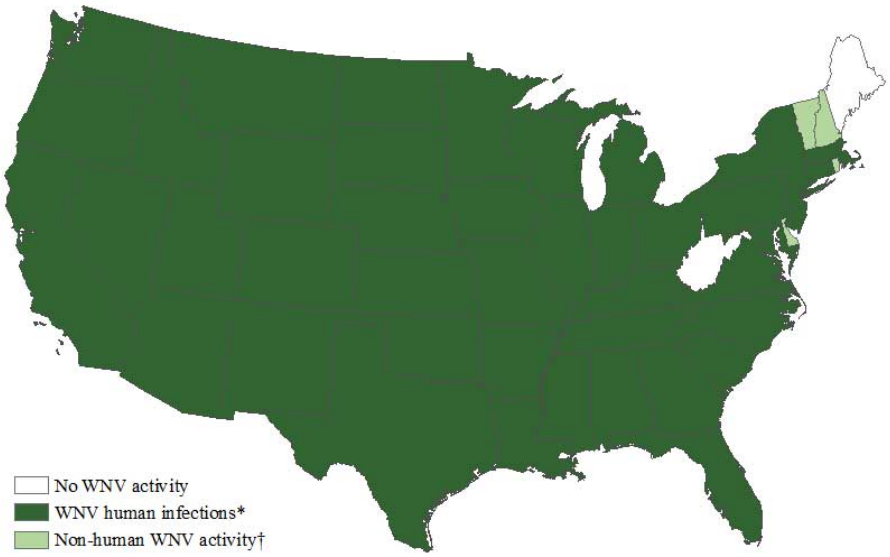
Table 7. Reported Vector Borne disease in Ohio and the United States, 2019

	OHIO		UNITED STATES	
Disease	2019 (as of 10/12) cumulative		Weeks 19 and 20 (9/29 to 10/12)	2019 (as of 10/12) Cumulative
Babesiosis	7		3	1816
Chikungunya	10		1	78
Dengue (includes dengue-like illness)	8		13	765
Eastern equine encephalitis	0		0	35
Erlichiosis / anaplasmosis	29		31	5454
Jamestown Canyon virus disease	0		0	18
LaCrosse virus disease	19		0	33
Lyme Disease	460		Not reported weekly by CDC	
Malaria	50		30	1257
Powassan virus disease	0		0	26
Spotted fever rickettsiosis	59		62	3429
St. Louis encephalitis virus disease	0		0	11
West Nile virus infection	2		6	742
Zika virus infection, non-congenital	0		0	13

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 October 15, 2019)



*WNV human disease cases or presumptive viremic blood donors. Presumptive viremic blood donors have a positive screening test which has not necessarily been confirmed.

†WNV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals.

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

West Nile virus infections in humans have been reported to CDC ArboNET from all 48 contiguous states except: Delaware, Maine, New Hampshire, Rhode Island, Vermont, and West Virginia.

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

VECTOR BORNE DISEASE NEWS

West Nile Nirus confirmed in Ohio horses, first two positive cases this year

The Ohio Department of Agriculture confirmed the first two positive cases this year of West Nile Virus in Ohio horses. A horse in Stark County confirmed with WNV was vaccinated once in the spring but did not receive a booster. The second horse's county of origin and vaccination history are not yet known. The spread of WNV in horses is preventable with proper vaccination and horse owners are urged to ensure their animal's vaccine and boosters are up to date.

West Nile Virus is transmitted to horses via bites from infected mosquitoes. Clinical signs for WNV include flulike symptoms, where the horse seems mildly anorexic and depressed. Changes in mentality, drowsiness, driving or pushing forward (often without control), and asymmetrical weakness may be observed. The mortality rate from WNV can be as high as 30-40 percent in horses. Infection with WNV does not always lead to signs of illness in people or animals. WNV is endemic in the United States and Ohio has reported positive cases in horses each of the last few years.

These WNV cases follow the Ohio Department of Agriculture's report of eastern equine encephalitis in an Ashtabula County horse on August 29. Since then, two additional horses have been confirmed with EEE, one each in Geauga and Portage counties. "West Nile Virus and eastern equine encephalitis are serious diseases that can be prevented with proper vaccination," State Veterinarian Dr. Tony Forshey said. "I encourage all owners to work with their local vet to keep their animals healthy."

In addition to vaccinations, horse owners also should work to reduce the mosquito population and eliminate possible breeding areas.

Recommendations include: *Removing stagnant water sources; keeping animals inside during the bugs' feeding times, which are typically early in the morning and evening; and using mosquito repellents.*

Because WNV and EEE can also be transmitted to humans by the bite of infected mosquitoes, animals diagnosed with these diseases are a sign that people should also take steps to guard themselves against mosquitoes by applying repellent and wearing protective clothing. Both diseases are very rare in humans, and only a few cases are reported in the United States each year.

There are no confirmed human cases associated with any of these equine cases in Ohio.

The Ohio Department of Agriculture is working with the Ohio Department of Health and local health officials to monitor both outbreaks. Suspect horse cases should be reported to a veterinarian as soon as possible. Citizens who are concerned about an illness should contact their physician.

Source: https://www.clermontsun.com/2019/10/11/west-nile-nirus-confirmed-in-ohio-horses-first-two-positive-cases-this-year/

Invasive Asian longhorned tick migrates to Delaware

An invasive tick previously found in Pennsylvania, New Jersey, and nine other states, has been spotted in Delaware for the first time. The Asian longhorned tick has yet to transmit any diseases to humans or animals in the U.S. — there only have been two confirmed cases of it attaching to humans here. However, the invasive species can carry pathogens and diseases that affect humans, wildlife and livestock. The bites have caused serious illness in China, Korea and Japan, according to the Delaware Department of Natural Resources and Environmental Control.

Figure 3. Asian longhorned tick, nymph (left) and adult (right)

The Asian longhorned tick can reproduce without a mate. It is known to swarm livestock, which can lead to substantial blood loss, and death if not removed. The insect also can infest wildlife, including mammals and birds, but the impact on wildlife in the U.S. is unknown.

In June, DNREC's new tick surveillance program found five young Asian longhorned ticks — called nymphs — in northern New Castle County. The creature, which lives in meadows and grassy areas near forested locations, is now one of seven tick species of concern in the state. Prior to migrating to North America, the Asian longhorned tick traveled to Australia and New Zealand. In the U.S., the bug was first discovered on sheep in New Jersey two years ago. However, the species has been in the U.S. since 2010, according to the Northeast Regional Center for Excellence in Vector-Borne Diseases at Cornell University.

DNREC advises the use of insect repellent containing DEET, spraying clothing with the insecticide Permethrin and wearing clothes that cover your arms and legs. DNREC also advises checking daily for ticks, removing them properly and showering after being outdoors. Anyone who develops a fever, rash, or other symptoms following a tick bite should contact their health care provider. Animal owners should consult their veterinarian about methods of tick prevention, and contact a veterinarian immediately if they notice signs of illness in their livestock, horses, or pets.

Source: https://whyy.org/articles/invasive-asian-longhorned-tick-migrates-to-delaware/

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@schd.org) or Tracy Rodriguez (trodriguez@schd.org), Summit County Public Health Communicable Disease Unit (330-375-2662). This report was issued on **October 18, 2019**.