



Vector Borne Disease 2018 Surveillance Report

Summit County Public Health



Report Weeks 21 and 22 (October 14 to October 27, 2018)
CDC/MMWR Weeks 42 and 43

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: 5/27 to 6/9	5	0	5	0	0.0%
Weeks 3 & 4: 6/10 to 6/23	2	0	7	0	0.0%
Weeks 5 & 6: 6/24 to 7/7	4	0	11	0	0.0%
Weeks 7 & 8: 7/9 to 7/21	6	0	17	0	0.0%
Weeks 9 & 10: 7/22 to 8/4	8	0	25	0	0.0%
Weeks 11 & 12: 8/5 to 8/18	5	0	30	0	0.0%
Weeks 13 & 14: 8/19 to 9/1	11	0	41	0	0.0%
Weeks 15 & 16: 9/2 to 9/15	8	1	49	1	2.0%
Weeks 17 & 18: 9/16 to 9/29	5	1	54	2	3.7%
Weeks 19 & 20: 9/30 to 10/13	7	0	61	2	3.3%
Weeks 21 & 22: 10/14 to 10/27	10	2	71	4	5.6%

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

West Nile virus testing (Table 1): During surveillance Weeks 21 and 22, there were 10 tests for West Nile virus (or arbovirus panels) ordered by Summit County hospitals, and there were two positive test results for WNV (Table 1).

Lyme Disease testing (Table 2): There were 31 diagnostic test series performed for Lyme disease during Weeks 21 and 22, five 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. If the Western blot test result is deemed indeterminate, the Lyme disease diagnosis may be based on the doctor's interpretation of the results and clinical symptoms.

Table 2. Lyme Disease tests ordered in Summit County hospitals

Week(s)	# of Lyme tests ordered this period	# of positive or indeterminate Lyme tests this period	Cumulative # of tests ordered this season	Cumulative # of positive or indeterminate tests this season	% of positive or indeterminate tests
Weeks 1 & 2: 5/27 to 6/9	63	9	63	9	14.3%
Weeks 3 & 4: 6/10 to 6/23	50	3	113	12	10.7%
Weeks 5 & 6: 6/24 to 7/7	60	5	173	17	9.8%
Weeks 7 & 8: 7/9 to 7/21	43	4	216	21	9.7%
Weeks 9 & 10: 7/22 to 8/4	51	2	267	23	8.6%
Weeks 11 & 12: 8/5 to 8/18	34	2	301	25	8.3%
Weeks 13 & 14: 8/19 to 9/1	36	1	337	26	7.7%
Weeks 15 & 16: 9/2 to 9/15	24	4	361	30	8.3%
Weeks 17 & 18: 9/16 to 9/29	26	0	387	30	7.6%
Weeks 19 & 20: 9/30 to 10/13	41	4	428	34	7.9%
Weeks 21 & 22: 10/14 to 10/27	31	5	459	39	8.5%

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

Reported Vector-borne diseases in 2018 (Table 3): As of October 27, there were 27 reported cases of Lyme disease, 5 reported cases of Rocky Mountain spotted fever, 1 case of dengue and 4 cases of malaria (dengue and malaria cases were the result of international travel). Three symptomatic cases of West Nile Virus infection were reported in October. Two of the WNV cases experienced severe neurological complications: WNV meningitis and WNV myelitis.

Table 3: Vector-borne diseases reported in Summit County, 2018 cumulative totals (as of 10/27/2018)

	Confirmed	Probable/Suspected	Notes
Tick-borne diseases:			
Babesiosis	0	0	
Ehrlichiosis / anaplasmosis	0	0	
Lyme disease	8	19	
Rocky Mountain spotted fever	0	5	
Mosquito-borne diseases:			
Chikungunya	0	0	
Dengue	1	0	Case was imported
Eastern equine encephalitis	0	0	
LaCrosse virus disease	0	0	
Malaria	4	0	All cases were Imported
St. Louis encephalitis virus disease	0	0	
Zika virus infection	0	0	
West Nile virus infection	1	2	Two cases had severe neurological complications

Source: Ohio Disease Reporting System (ODRS); only confirmed, probable, and suspected cases are included. Case counts may updated as case status changes.

Table 4: Reported aseptic meningitis cases in Summit County (confirmed & probable)

Week(s)	Cases reported this period	Cumulative cases for the season
Aseptic meningitis cases reported prior to season (1/1 to 5/26/2018)	6	-
Week 1-2: 5-27 to 6-9	2	2
Week 3-4: 6-10 to 6-23	0	2
Week 5-6: 6-24 to 7-7	2	4
Week 7-8: 7-8 to 7-21	5	9
Week 9-10: 7-22 to 8-4	2	11
Week 11-12: 8-5 to 8-18	2	13
Week 13-14: 8-19 to 9-1	2	15
Week 15-16: 9-2 to 9-15	0	15
Week 17-18: 9-16 to 9-29	6	21
Week 19-20: 9-30 to 10-13	0	21
Week 21-22: 10-14 to 10-27	1	22

Source: Ohio Disease Reporting System (ODRS)

Reported aseptic meningitis cases (Table 4): There were no new cases reported during Weeks 21 and 22, increasing the season total case count to 22 and the 2018 YTD total to 28. Aseptic (viral) meningitis is the most common type of meningitis and occurs predominately in the summer and fall. While most aseptic meningitis cases are due to gastrointestinal or respiratory viruses, similar symptoms may be present with arthropod-borne diseases.

Mosquito testing (Table 5): Based on the ODH mosquito testing summary released on October 22, 127,730 mosquitoes were collected as 3,557 pooled samples throughout Summit County. 646 of the pooled samples tested positive for West Nile virus during the 2018 season.

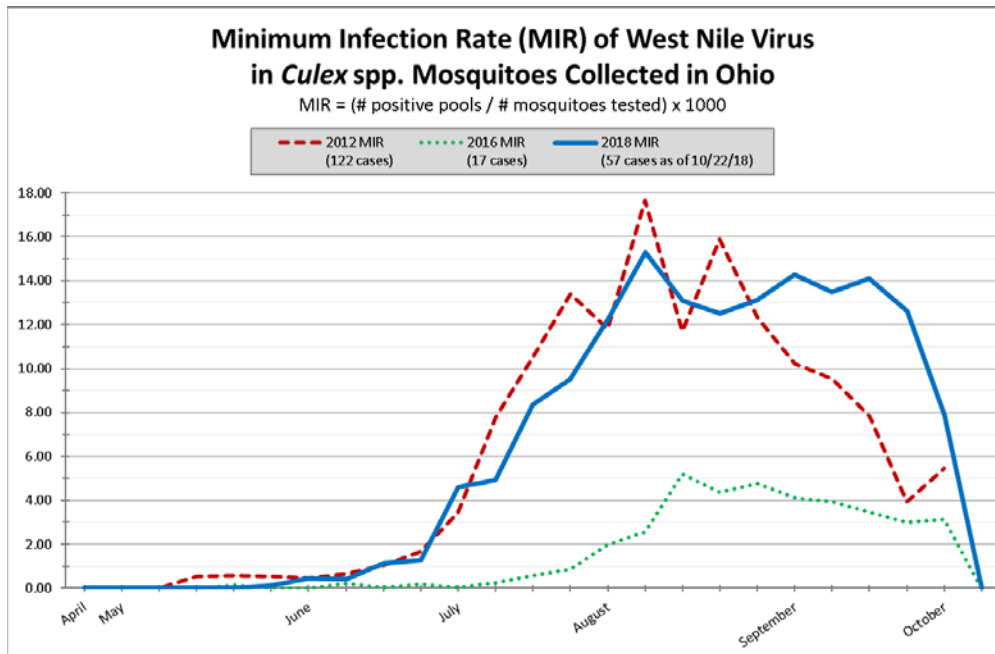
Table 5. Mosquito testing in Summit County (Final counts, reported 10/22/2018)

Mosquitoes submitted and identified	127,730
Pooled samples tested	3,561
Positive WNV pooled samples	646

Note: All mosquitoes tested for WNV were *Culex sp.*

OHIO AND UNITED STATES ARBOVIRUS SURVEILLANCE

Figure 1. Ohio West Nile virus activity in 2012, 2016 and 2018 (as of 10/26/2018)



The minimum infection rate (MIR) functions as an indicator of seasonal West Nile virus (WNV) activity. A high MIR in mosquitoes is commonly associated with higher WNV case counts in humans. In 2018, the MIR remained elevated throughout September, but experienced a rapid decline in the first two weeks of October. Mosquito testing officially ended on October 13, and there were no positive mosquito pools detected in Ohio during that final week.

Source: Ohio Department of Health, Zoonotic Disease Program

Ohio Mosquito-borne Disease 2018 Numbers At-A-Glance
As of October 29, 2018 12:00 pm

West Nile virus (WNV)	Notes
501,366 Mosquitoes tested	Collected by 82 agencies in 69 counties, pooled into 16,902 samples
3,281 WNV positive mosquito samples	Adams (6), Ashland (4), Ashtabula (5), Athens (22), Belmont (1), Brown (5), Butler (8), Clark (9), Clermont (12), Columbiana (2), Coshocton (1), Cuyahoga (34), Delaware (7), Fairfield (4), Franklin (1,324), Geauga (1), Greene (5), Guernsey (2), Hamilton (9), Hancock (11), Henry (12), Hocking (13), Huron (8), Jefferson (2), Lake (98), Licking (75), Lorain (26), Lucas (293), Mahoning (10), Medina (1), Meigs (1), Miami (6), Montgomery (71), Morgan (2), Morrow (7), Noble (1), Ottawa (20), Pickaway (42), Portage (88), Richland (39), Ross (10), Scioto (28), Seneca (16), Stark (103), Summit (646), Trumbull (3), Tuscarawas (29), Union (5), Vinton (4), Warren (94), Washington (13), Williams (5), Wood (34) and Wyandot (4) counties
43 WNV veterinary cases	43 equines in Ashtabula (3), Champaign (1), Coshocton (2), Geauga (3), Holmes (19), Knox (1), Lorain (2), Medina (1), Pickaway (1), Seneca (1), Stark (1), Trumbull (2), Tuscarawas (1) and Wayne (5) counties, onset of symptoms 08/06/2018-09/29/2018
12 WNV asymptomatic viremic blood donors	4 females, 8 males ranging in age 30-69 years (median 55.5 years) in Carroll (1), Columbiana (1), Coshocton (1), Cuyahoga (1), Darke (1), Delaware (1), Franklin (2), Hancock (1), Henry (1), Lucas (1) and Summit (1) counties
57 WNV human cases	23 females, 34 males ranging in age 23-89 years (median 60 years) in Auglaize (2), Belmont (1), Clark (1), Columbiana (1), Cuyahoga (9), Defiance (1), Erie (1), Franklin (2), Fulton (1), Guernsey (1), Hamilton (5), Hardin (1), Holmes (2), Lake (2), Lucas (2), Medina (1), Montgomery (3), Paulding (1), Preble (1), Ross (2), Stark (6), Summit (2), Trumbull (4), Wayne (2), Williams (1) and Wyandot (1) counties, onset of symptoms 06/23/2018-10/09/2018
67 Ohio counties with WNV activity reported	Includes counties with WNV positive mosquitoes, equine WNV cases, human WNV cases and human WNV asymptomatic viremic blood donors

Other locally-acquired mosquito-borne cases		Notes
31	La Crosse human cases	16 females, 15 males ranging in age 3-17 years (median 7 years) in Coshocton (1), Crawford (1), Fairfield (1), Hocking (2), Holmes (1), Knox (2), Licking (6), Lorain (1), Medina (1), Miami (1), Morgan (1), Morrow (2), Muskingum (2), Perry (1), Richland (1), Ross (1), Stark (4), Union (1) and Wayne (1) counties, onset of symptoms 06/20/2018-09/26/2018
3	Unspecified California virus human cases	1 female, 2 males ranging in age 11-16 years (median 11 years) in Franklin (1), Medina (1) and Morrow (1) counties, onset of symptoms 07/06/2018-08/06/2018

Travel-associated mosquito-borne disease cases		Notes
1	Chikungunya virus human cases*	1 female aged 22 years with travel to Peru, onset of symptoms 08/26/2018
4	Dengue human cases*	3 females, 1 male ranging in age 6-45 years (median 28.5 years) with travel to Haiti (2), Mexico (1) and Venezuela (1), onset of symptoms 04/07/2018-08/01/2018
0	Zika virus human cases*	
45	Malaria human cases	17 females, 28 males ranging in age 9 months-72 years (median 36 years) with travel to several African countries, Peru and Thailand

Source: <https://www.odh.ohio.gov/arboupdate>

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 bites. Additional information can be found from the [Centers for Disease Control and Prevention \(CDC\)'s Travelers' Health](#) and [Pan-American Health Organization](#) websites.

Table 6. Reported Vector Borne disease in Ohio and the United States, 2018

Disease	OHIO	UNITED STATES	
	2018 (as of 10/27) Cumulative	Weeks 21 and 22 (10/14 to 10/27)	2018 (as of 10/27) Cumulative
Babesiosis	1	29	1442
Chikungunya	1	0	76
Dengue (includes dengue-like illness)	4	0	215
Eastern equine encephalitis	0	0	5
Erlchiosis / anaplasmosis	23	83	4180
LaCrosse virus disease	32	1	67
Lyme Disease	320	Not reported weekly by CDC	
Malaria	46	15	1139
Spotted fever rickettsiosis	55	45	4034
St. Louis encephalitis virus disease	0	0	4
West Nile virus infection (total)	57	4	2208
Neuroinvasive		3	1301
Non neuroinvasive		1	907
Zika virus infection, non congenital	0	0	55

Note: Data is provisional and subject to change

Source: Ohio Disease Reporting System (ODRS), MMWR weekly reports

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

Figure 2. West Nile virus activity by state – United States, 2018 (as of October 30, 2018)



There have been no changes in West Nile Virus reporting by state since the previous report. In addition to Ohio, human WNV cases have been reported in all but 3 of the 48 contiguous states and the District of Columbia. Three states, West Virginia, New Hampshire, and Vermont, reported non-human WNV activity only.

Source: <https://www.cdc.gov/westnile/statsmaps/preliminarymapsdata2018/activitybystate2018.html>

VECTOR BORNE DISEASE NEWS

Virginia hawk is first bird in North America found carrying invasive tick

Although the geographic spread of the invasive longhorned tick has slowed during the second half of the surveillance season, there was one new major development in September. Some of the ticks collected from a red-tailed hawk in northern Virginia were identified as longhorned ticks, the first time this was documented in the United States. The hawk was being treated at the Blue Ridge Wildlife Center in Boyce, VA. Previous to this finding, the invasive tick has only been found on non-flying animals, including sheep, dogs, and humans. The presence of the longhorned tick on birds may hasten the expansion of its range to areas outside the eight states it has been identified in so far: New Jersey, Virginia, West Virginia, North Carolina, Pennsylvania, New York, Arkansas, and most recently, Maryland.

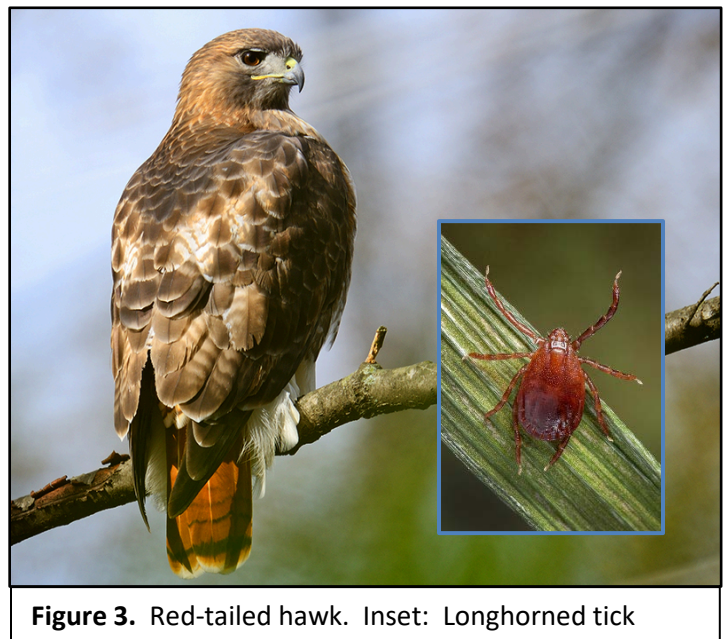
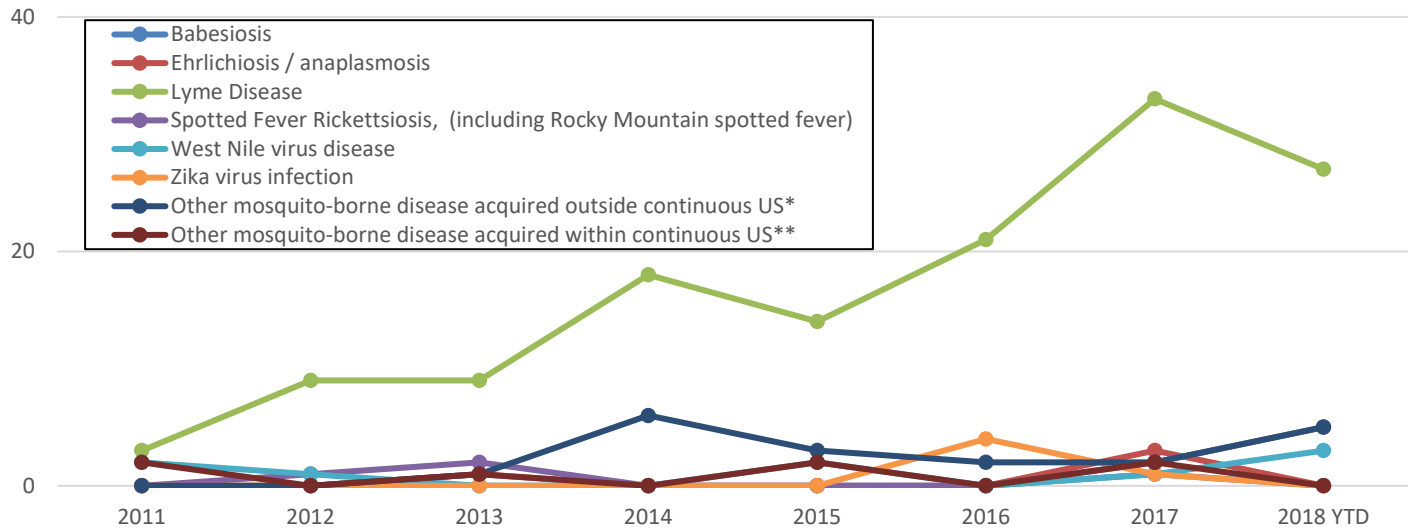


Figure 3. Red-tailed hawk. Inset: Longhorned tick

Source: <https://www.localdvm.com/news/virginia/virginia-hawk-first-bird-in-north-america-found-carrying-invasive-tick/1560920669>

2018 VECTOR BORNE DISEASE SEASON SUMMARY

Figure 4. Vector borne diseases reported in Summit County residents, 2011 to 10/27/2018



Notes:

* Includes imported cases of malaria, chikungunya, and dengue

** Includes LaCrosse virus disease and St. Louis encephalitis virus disease

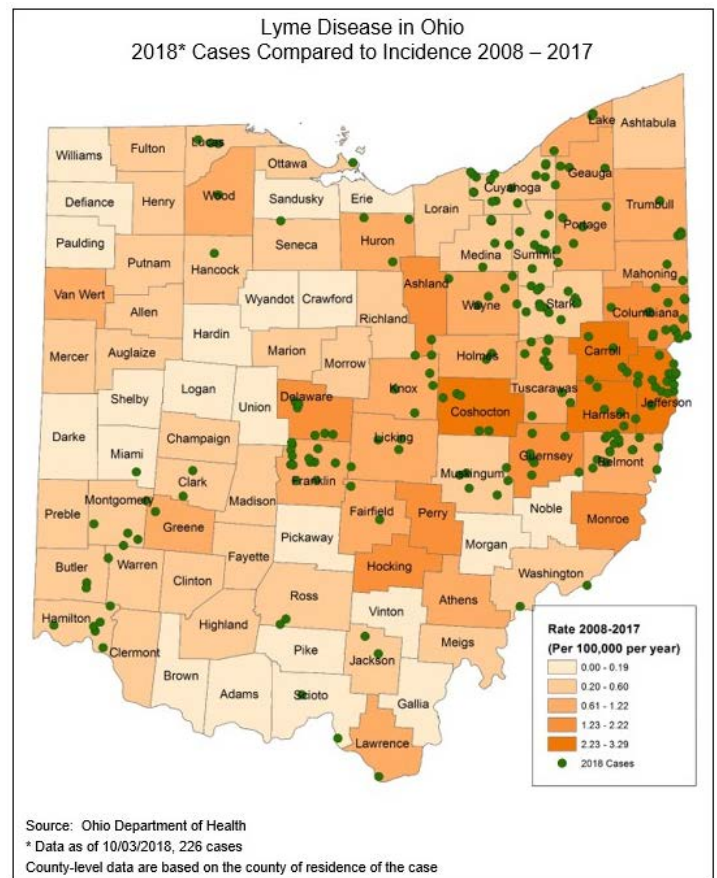
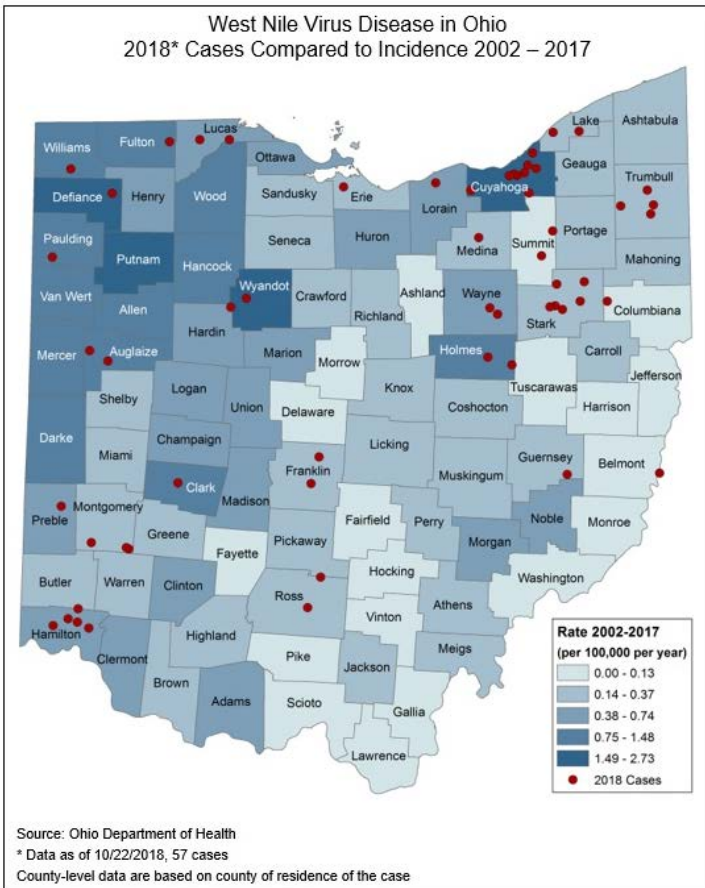
Table 7. Reported vector-borne disease cases in Summit County, 2011 - 10/27/2018

	2011	2012	2013	2014	2015	2016	2017	2018 YTD
Babesiosis	0	0	0	0	0	0	1	0
Ehrlichiosis / anaplasmosis	0	0	1	0	0	0	3	0
Lyme Disease	3	9	9	18	14	21	33	27
Spotted Fever Rickettsiosis, (including Rocky Mountain spotted fever)	0	1	2	0	0	0	2	5
West Nile virus disease	2	1	0	0	2	0	1	3
Zika virus infection	0	0	0	0	0	4	1	0
Other mosquito-borne disease acquired outside continuous US*	0	0	1	6	3	2	2	5
Other mosquito-borne disease acquired within continuous US**	2	0	1	0	2	0	2	0

Source: Ohio Disease Reporting System (ODRS)

Summit County Cases: Vector borne disease cases for 2018 year to date, and for the previous years 2011 to 2017, are listed in Table 7 and shown graphically in Figure 4. There have been 27 cases of Lyme disease so far, and the case total for 2018 is projected to be similar to the total for 2017. Summit County also had higher case numbers for West Nile virus disease and spotted fever rickettsiosis, at 3 and 5 cases respectively.

Ohio Cases: Geographic and yearly trends for both West Nile virus disease and Lyme disease are shown in the maps and tables on page 8. As of October 22, there were 57 reported cases of WNV disease in Ohio, even though 2018 was a year with high WNV activity in mosquitos statewide. As of October 3, there were 226 reported cases of Lyme disease in Ohio. Lyme disease incidence rates have increased steadily in Ohio since 2008, with 270 case reported in 2017.



Ohio West Nile Virus Disease Annual Human Case Statistics						
Year	Human Cases	Deaths	Median Age (Years)	Age Range of Cases (Years)	Earliest Date of Symptom Onset	Asymptomatic Blood Donors
2001	0	0	n/a	n/a	n/a	n/a
2002	441	31	61	2 – 98	n/a	n/a
2003	108	8	49	11 – 90	n/a	6
2004	12	2	49.5	12 – 87	Jul 5	1
2005	61	2	53	22 – 96	Jun 14	14
2006	48	4	57.5	2 – 86	Aug 1	10
2007	23	3	52	11 – 86	Jul 12	9
2008	15	1	57	20 – 86	Jul 9	1
2009	2	0	36.5	11 – 62	Aug 27	0
2010	5	0	46	4 – 74	Jul 9	0
2011	21	1	55	14 – 83	Aug 1	6
2012	122	7	57.5	4 – 91	Jul 10	13
2013	24	4	71.5	38 – 82	Jul 29	4
2014	11	1	65	19 – 79	Jul 27	0
2015	35	2	65	14 – 91	Jul 9	10
2016	17	4	66	4 – 84	Jul 28	4
2017	34	5	59	6 – 82	Jul 24	8
AVERAGE	58	4	56	n/a	n/a	6
TOTAL	979	75	n/a	n/a	n/a	86

Ohio Lyme Disease Annual Case Statistics					
Year	Human Cases	Deaths	Median Age (Years)	Age Range of Cases (Years)	Counties with Reported Lyme Cases
2008	45	0	30	5 - 74	28
2009	58	0	36.5	2 - 77	27
2010	44	0	34.5	3 - 62	24
2011	53	0	34	5 - 84	25
2012	67	0	33	3 - 86	30
2013	93	0	43	2 - 84	34
2014	119	0	35	1 - 78	32
2015	154	0	41	1 - 85	45
2016	160	0	37	3 - 85	40
2017	270	0	40	3-86	44
AVERAGE	106	0	36.3	n/a	33
TOTAL	1,063	0	n/a	n/a	n/a

Sources: <https://www.odh.ohio.gov/wnv>
<https://www.odh.ohio.gov/lyme>

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 **November 2, 2018**.