



Animal and Plant Health Inspection Service

Veterinary Services

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2019 Summary of Eastern Equine Encephalitis Cases in the United States

January 1 – December 31, 2019

This report is a descriptive summary of U.S. Eastern equine encephalitis (EEE) cases reported to the United States Department of Agriculture (USDA) in 2019. The USDA Animal and Plant Health Inspection Service (APHIS) Veterinary Services (VS) branch collaborates with the U.S. Centers for Disease Control and Prevention (CDC) and State veterinary and public health officials to facilitate communication about arbovirus disease cases in horses and confirm equine cases in each State. CDC collects arbovirus case information using its ArboNET reporting system, an electronic surveillance and reporting system used to track and report arboviral activity in humans and animals. During the transmission season, VS disseminates the equine arbovirus case information to State animal health officials for confirmation and posts the number of confirmed cases to the USDA equine information Web site <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/equine>. This site also provides specific case definitions. In this document, ‘reported cases’ of EEE may include presumptive positive and confirmed positive cases.

In 2019, **184** equine cases of EEE were reported from **24** States. Figure 1 shows the annual number of equine EEE cases reported in the U.S. from 2006 through 2019. Figure 2 shows the number of equine EEE cases in each State in 2019, and Table 1 provides the number of cases per county or parish in those States in 2019.

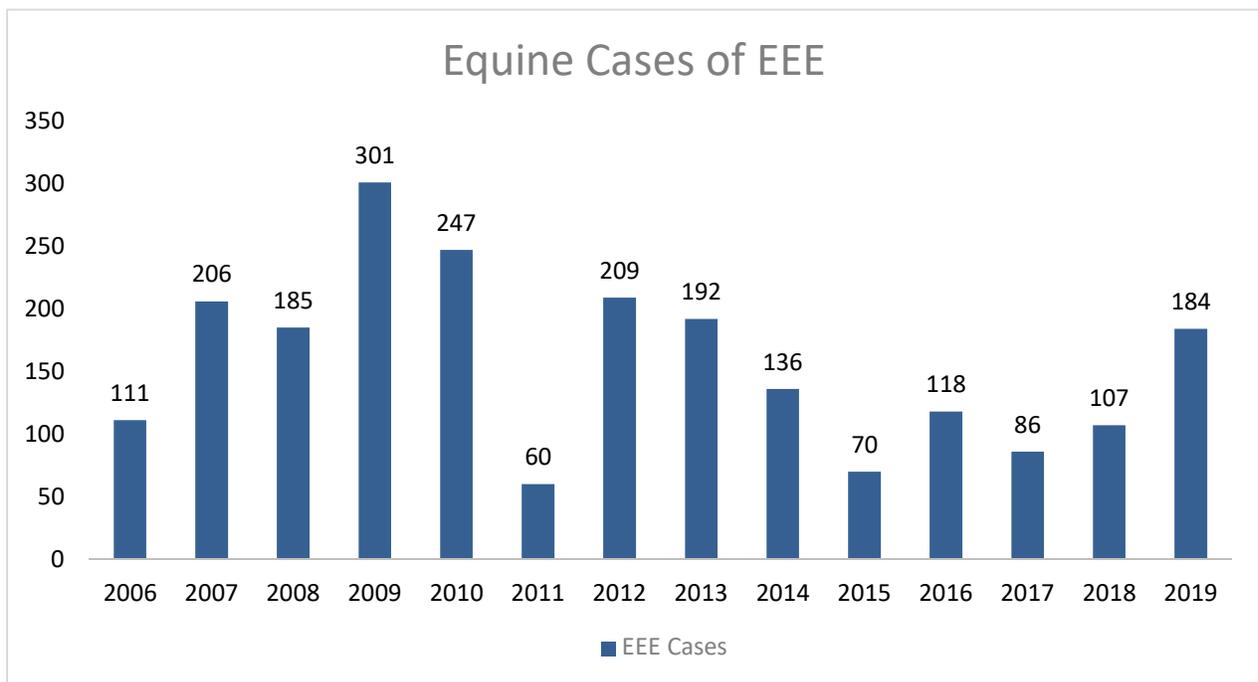


Figure 1. Reported U.S. equine cases of Eastern equine encephalitis, 2006-2019

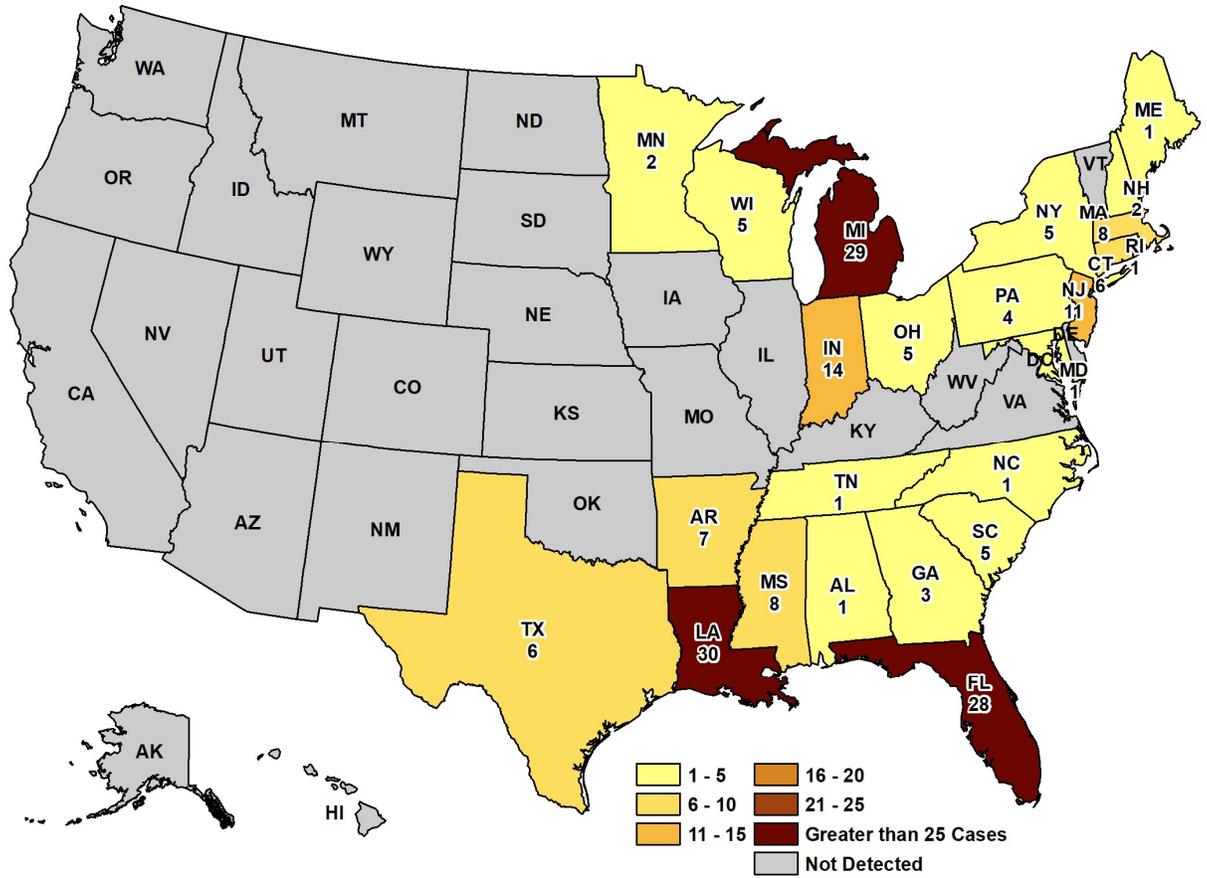


Figure 2. Distribution of reported equine EEE cases in 2019 (184 total cases)

Table 1. Number of reported equine EEE cases by State and county, 2019

State	County	Eastern Equine Encephalitis Reported Cases
Alabama	Houston County	1
Total Cases for Alabama		1
Arkansas	Arkansas County	1
	Hot Spring County	1
	Lonoke County	1
	Pulaski County	2
	Saline County	2

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State	County	Eastern Equine Encephalitis Reported Cases
Total Cases for Arkansas		7
Connecticut	New London County	4
	Tolland County	1
	Windham County	1
Total Cases for Connecticut		6
Florida	Bay County	2
	Calhoun County	3
	Citrus County	1
	Clay County	1
	Columbia County	1
	DeSoto County	2
	Gulf County	1
	Holmes County	3
	Jackson County	1
	Levy County	1
	Madison County	1
	Osceola County	1
	Palm Beach County	1
	Pasco County	1
	Polk County	1
	Putnam County	2
	St. Johns County	1
	Suwannee County	2
	Washington County	2
Total Cases for Florida		28
Georgia	Dooly County	1
	Lowndes County	2
Total Cases for Georgia		3
Indiana	Elkhart County	11
	Lagrange County	3
Total Cases for Indiana		14
Louisiana	Allen Parish	1
	Assumption Parish	2
	Avoyelles Parish	1
	Beauregard Parish	2
	Caddo Parish	4
	De Soto Parish	2
	Iberville Parish	1
	Lafourche Parish	2

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State	County	Eastern Equine Encephalitis Reported Cases
	Morehouse Parish	1
	Pointe Coupee Parish	1
	Rapides Parish	1
	Red River Parish	1
	St. Mary Parish	1
	St. Tammany Parish	2
	Tangipahoa Parish	2
	Terrebonne Parish	3
	Union Parish	1
	Webster Parish	1
	West Baton Rouge Parish	1
Total Cases for Louisiana		30
Massachusetts	Essex County	1
	Middlesex County	1
	Norfolk County	1
	Worcester County	5
Total Cases for Massachusetts		8
Maryland	Worcester County	1
Total Cases for Maryland		1
Maine	York County	1
Total Cases for Maine		1
Michigan	Allegan County	1
	Barry County	2
	Calhoun County	1
	Cass County	2
	Jackson County	4
	Kalamazoo County	6
	Kent County	1
	Lapeer County	1
	Leelanau County	1
	Livingston County	1
	Montcalm County	1
	Newaygo County	1
	St. Joseph County	6
	Tuscola County	1
Total Cases for Michigan		29
Minnesota	Otter Tail County	2
Total Cases for Minnesota		2

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State	County	Eastern Equine Encephalitis Reported Cases
Mississippi	Greene County	1
	Hancock County	1
	Jackson County	5
	Kemper County	1
Total Cases for Mississippi		8
North Carolina	Cumberland County	1
Total Cases for North Carolina		1
New Hampshire	Hillsborough County	1
	Rockingham County	1
Total Cases for New Hampshire		2
New Jersey	Atlantic County	1
	Burlington County	1
	Camden County	1
	Monmouth County	1
	Morris County	1
	Ocean County	5
	Salem County	1
Total Cases for New Jersey		11
New York	Ontario County	1
	Oswego County	4
Total Cases for New York		5
Ohio	Ashtabula County	3
	Portage County	2
Total Cases for Ohio		5
Pennsylvania	Carbon County	2
	Luzerne County	1
	Mercer County	1
Total Cases for Pennsylvania		4
Rhode Island	Washington County	1
Total Cases for Rhode Island		1
South Carolina	Beaufort County	2
	Chesterfield County	1
	Marlboro County	1
	Sumter County	1
Total Cases for South Carolina		5
Tennessee	Gibson County	1
Total Cases for Tennessee		1
Texas	Liberty County	1
	Montgomery County	1

State	County	Eastern Equine Encephalitis Reported Cases
	Orange County	3
	Smith County	1
Total Cases for Texas		6
Wisconsin	Barron County	1
	Green Lake County	1
	Taylor County	1
	Walworth County	1
	Waushara County	1
Total Cases for Wisconsin		5
Total Reported Eastern Equine Encephalitis Cases for the United States		184

The 2019 case count of EEE cases in equids throughout the U.S. did not set a high historical record; however, there are several observations surrounding EEE infections that made this year particularly interesting for both human medical doctors and veterinarians. Thirty-eight human cases of EEE with 15 fatalities were confirmed in 10 States. This is a record-setting number of human cases, with the next highest yearly total of 15 cases recorded in 2012 and an average of 7 EEE cases confirmed annually from 2009-2018.

Another unexplained yet interesting finding is the number of equine West Nile Virus (WNV) cases compared to the number of equine EEE cases in 2019. Historically, the annual WNV case counts in equids have been at least double or more the total number of EEE case counts. In 2019, a complete reversal of these disease totals occurred, with 90 WNV equine cases recorded compared to 184 EEE equine cases. Finally, the number of EEE cases confirmed and reported in alternate and wildlife species has not previously been seen at such a high level and in so many different species as during 2019.

When spikes in human cases of EEE occur, causes may include environmental and viral factors, from weather and geographic features to new EEE strains infecting migratory birds and circulating among them and mosquito populations.¹ Like equids, humans are a dead-end host for the virus, which is predominantly spread by mosquitoes. No commercial vaccine is available for people. Thus, EEE infection often causes death or leads to significant neurological deficits for survivors, making it one of the worst viral encephalitides that people can acquire.

EEE is also a deadly disease in equids, where mortality rates can approach 90 percent in unvaccinated animals. This susceptibility to the virus makes equids a recognized EEE sentinel species for the human population. The main public health purpose of confirming and reporting equine EEE cases is to inform human surveillance efforts. Because equine commercial vaccines are available and convey good protection against EEE infection, reported cases of EEE in equids tend to be in unvaccinated or under-vaccinated animals. Equine vaccination practices effective against new and established strains of EEE may explain, in part, why overall numbers of equine EEE cases did not show a similar annual spike as reported in humans or additional species.

1. Tan Y, Lam TT, Heberlein-Larson LA, et al. Large-Scale Complete-Genome Sequencing and Phylodynamic Analysis of Eastern Equine Encephalitis Virus Reveals Source-Sink Transmission Dynamics in the United States. *J Virol.* 2018;92(12):e00074-18. Published 2018 May 29. doi:10.1128/JVI.00074-18