

West Nile virus (WNV) and other arboviral activity -- United States, 2011 Final 2011 data reported to ArboNET

This report contains final ArboNET data for **2011** for nationally notifiable arboviral diseases caused by West Nile, eastern equine encephalitis, La Crosse, Powassan, and St. Louis encephalitis viruses. Dengue cases are reported in a separate update available from the CDC Dengue Branch.

West Nile virus (WNV) activity in 2011

In 2011, 568 counties from 48 states/districts reported WNV activity, including 44 states/districts with reported WNV human infections (i.e., disease cases or viremic blood donors) and four additional states with reported WNV activity in non-human species only (i.e., veterinary cases, mosquito pools, dead birds, or sentinel animals) [Figures 1 and 2]. The only states with no WNV activity reported in 2011 were Alaska, Hawaii, and Maine.

Figure 1. West Nile virus (WNV) activity reported to ArboNET, by state, United States, 2011

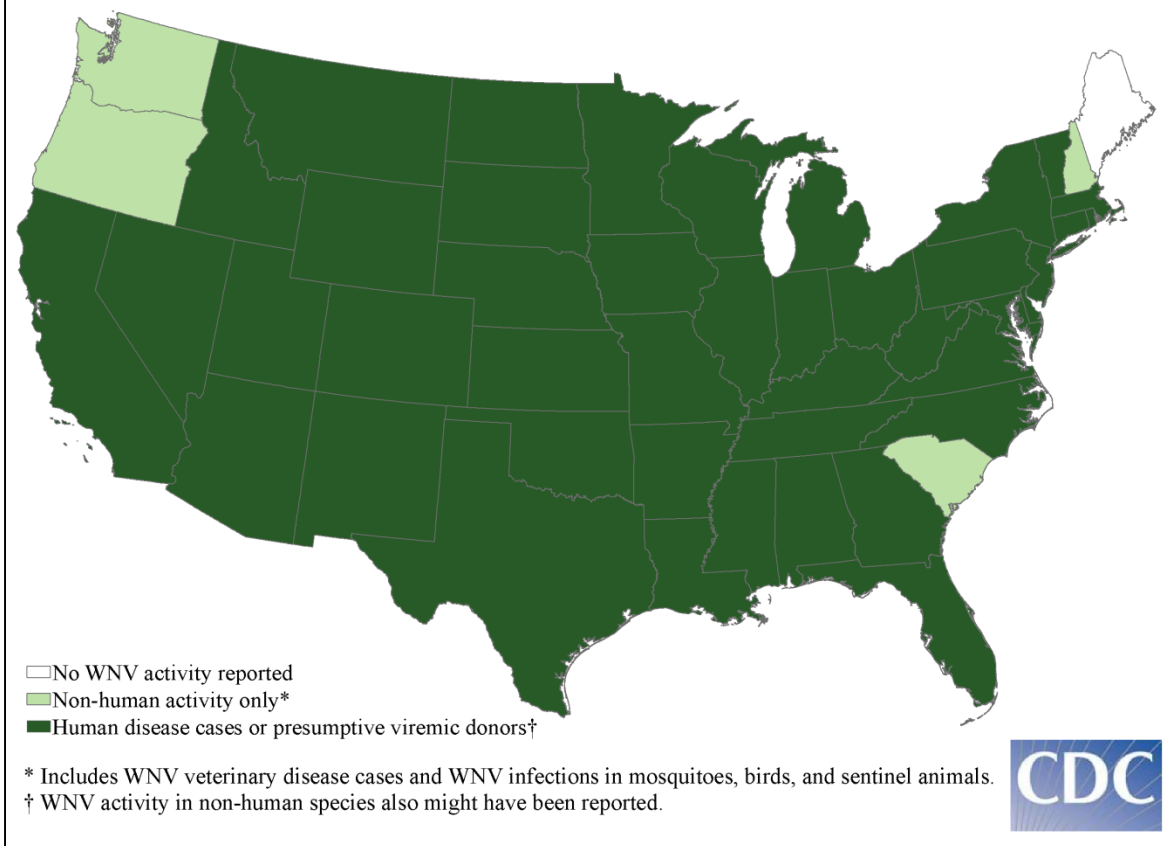
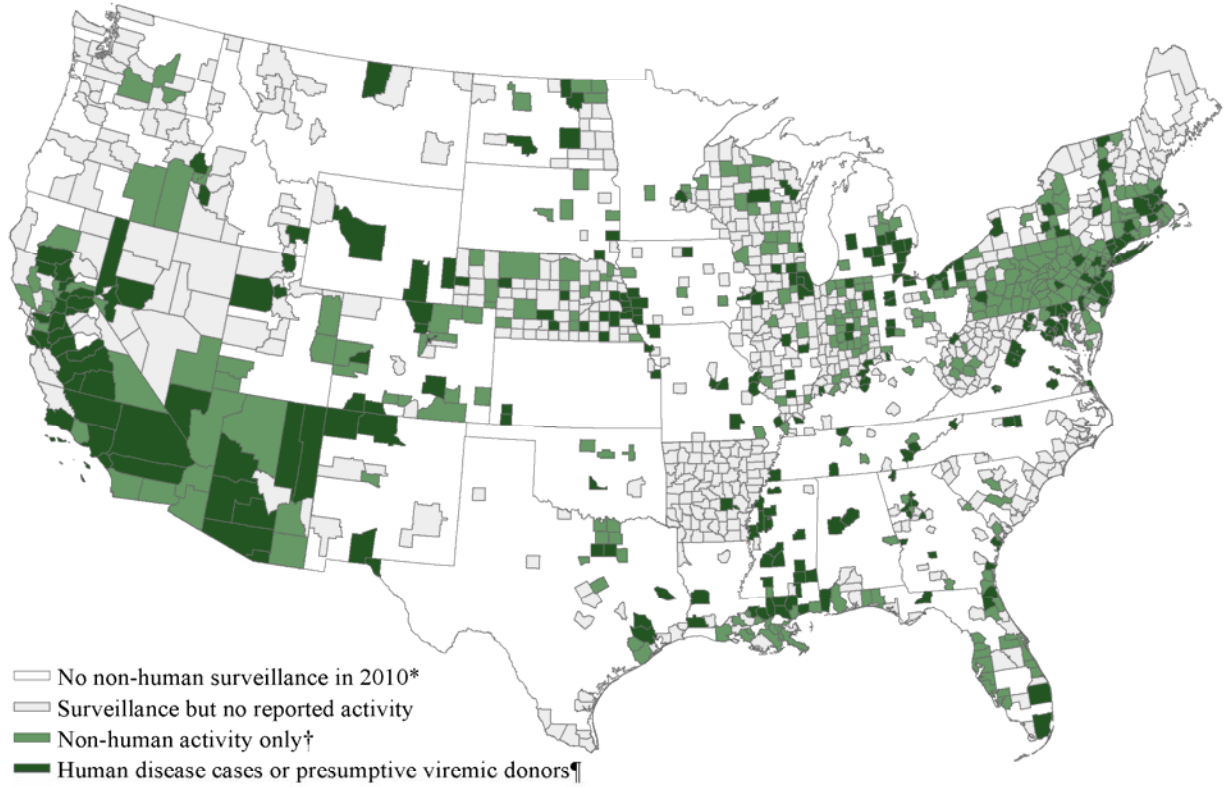


Figure 2. West Nile virus (WNV) activity reported to ArboNET, by county, United States, 2011



- No non-human surveillance in 2010*
- Surveillance but no reported activity
- Non-human activity only†
- Human disease cases or presumptive viremic donors‡

* As reported by state health departments in a survey conducted in October 2010. Surveillance for human disease and viremic blood donors is performed in all counties.

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

‡ WNV activity in non-human species also might have been reported.





WNV human infections reported for 2011

Reported WNV disease cases

In 2011, 712 human cases of WNV disease were reported from 43 states and the District of Columbia [Table 1]. Of all WNV disease cases reported, 486 (68%) were classified as neuroinvasive disease (e.g., meningitis, encephalitis, acute flaccid paralysis) and 226 (32%) as non-neuroinvasive disease.

Dates of illness onset for disease cases ranged from January–December; 572 (80%) of reported cases occurred in August and September. [Figure 3]. Additional demographic and clinical characteristics of reported cases are provided in Table 6 on page 9 of this report.

Estimated WNV disease cases

Based on serosurvey results, for every case of WNV neuroinvasive disease, there are an estimated 26.5 non-neuroinvasive disease cases. Using the 486 reported neuroinvasive disease cases, an estimated 12,879 non-neuroinvasive disease cases occurred in the United States in 2011. However, only 226 were diagnosed and reported; 2% of non-neuroinvasive disease cases estimated to have occurred.

Presumptive viremic donors (PVDs)

A total of 137 WNV PVDs were reported from 24 states [Table 1]. Of these, one (1%) of the viremic blood donors subsequently developed neuroinvasive disease and 32 (23%) subsequently developed non-neuroinvasive disease.

Comparison to 2010 data

In 2010, there were 1,021 human WNV disease cases (629 neuroinvasive disease cases and 392 non-neuroinvasive disease cases) and 144 PVDs reported to ArboNET.

Figure 3. West Nile virus (WNV) human disease cases reported to ArboNET by week of onset, United States, 2011

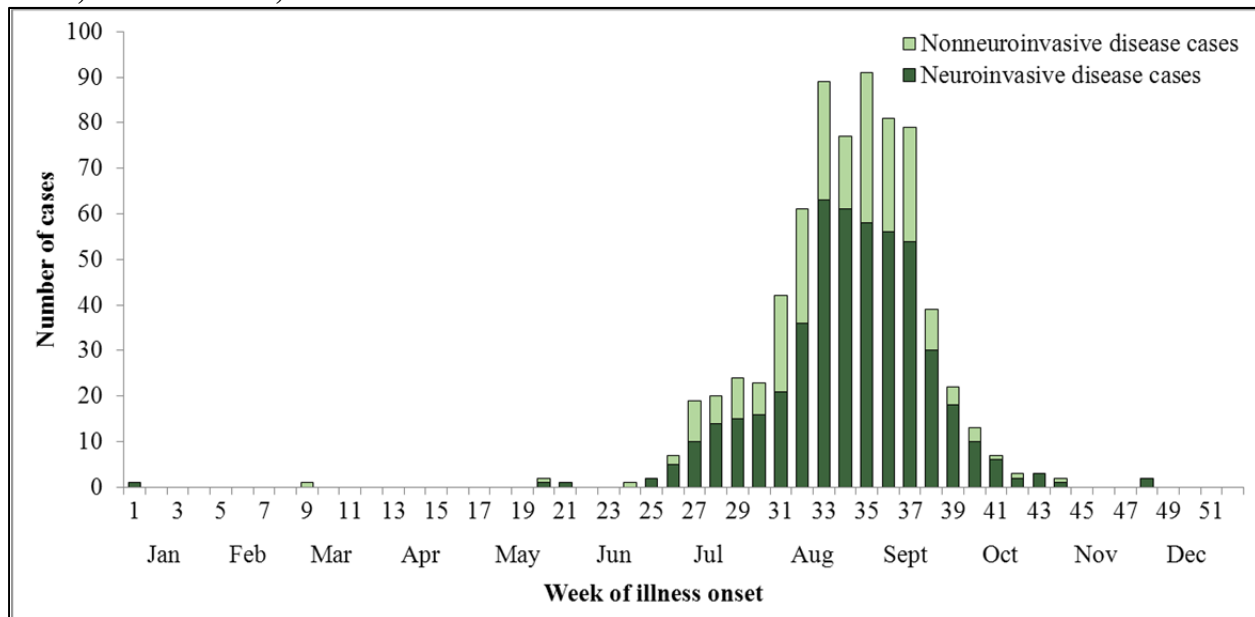


Table 1. Human West Nile virus (WNV) infections reported to ArboNET, 2011

State	Reported human disease cases			Deaths	Presumptive viremic donors (PVDs) [†]
	Neuroinvasive disease cases	Non-neuroinvasive disease cases	Total cases*		
Alabama	5	--¶	5	1	--
Arizona	49	20	69	4	13
Arkansas	1	--	1	--	--
California	110	48	158	9	27
Colorado	2	5	7	--	1
Connecticut	8	1	9	--	--
Delaware	1	--	1	--	--
District of Columbia	10	5	15	--	--
Florida	20	4	24	2	3
Georgia	14	8	22	3	4
Idaho	1	2	3	--	--
Illinois	22	12	34	3	7
Indiana	7	2	9	1	3
Iowa	5	4	9	--	--
Kansas	4	--	4	1	--
Kentucky	4	1	5	1	2
Louisiana	6	4	10	--	3
Maryland	10	9	19	--	3
Massachusetts	5	1	6	--	1
Michigan	32	2	34	2	1
Minnesota	1	1	2	1	--
Mississippi	31	21	52	5	8
Missouri	6	4	10	--	2
Montana	1	--	1	--	--
Nebraska	14	15	29	--	9
Nevada	12	4	16	2	3
New Jersey	2	5	7	--	1
New Mexico	4	--	4	--	2
New York	28	16	44	2	8
North Carolina	2	--	2	--	--
North Dakota	1	3	4	--	--
Ohio	10	11	21	1	9
Oklahoma	1	--	1	--	--
Pennsylvania	5	1	6	--	--
Rhode Island	1	--	1	--	--
South Dakota	--	2	2	--	--
Tennessee	16	2	18	2	--
Texas	20	7	27	2	16
Utah	1	2	3	--	1
Vermont	1	--	1	--	1
Virginia	8	1	9	1	9
West Virginia	2	--	2	--	--
Wisconsin	2	1	3	--	--
Wyoming	1	2	3	--	--
Totals	486	226	712	43	137

*Includes confirmed and probable cases.

¶None reported.

[†]Of the 137 PVDs, 33 (24%) developed clinical illness and are also included as “Reported human disease cases”.

Eastern equine encephalitis virus (EEEV) activity in 2011

In 2011, a total of 14 states reported EEEV activity to ArboNET, including three states with reported human disease cases and eleven additional states with reported EEEV activity in non-human species only [Figure 4 and Table 2]. In addition, an imported human case was reported from Missouri (infection acquired in Massachusetts).

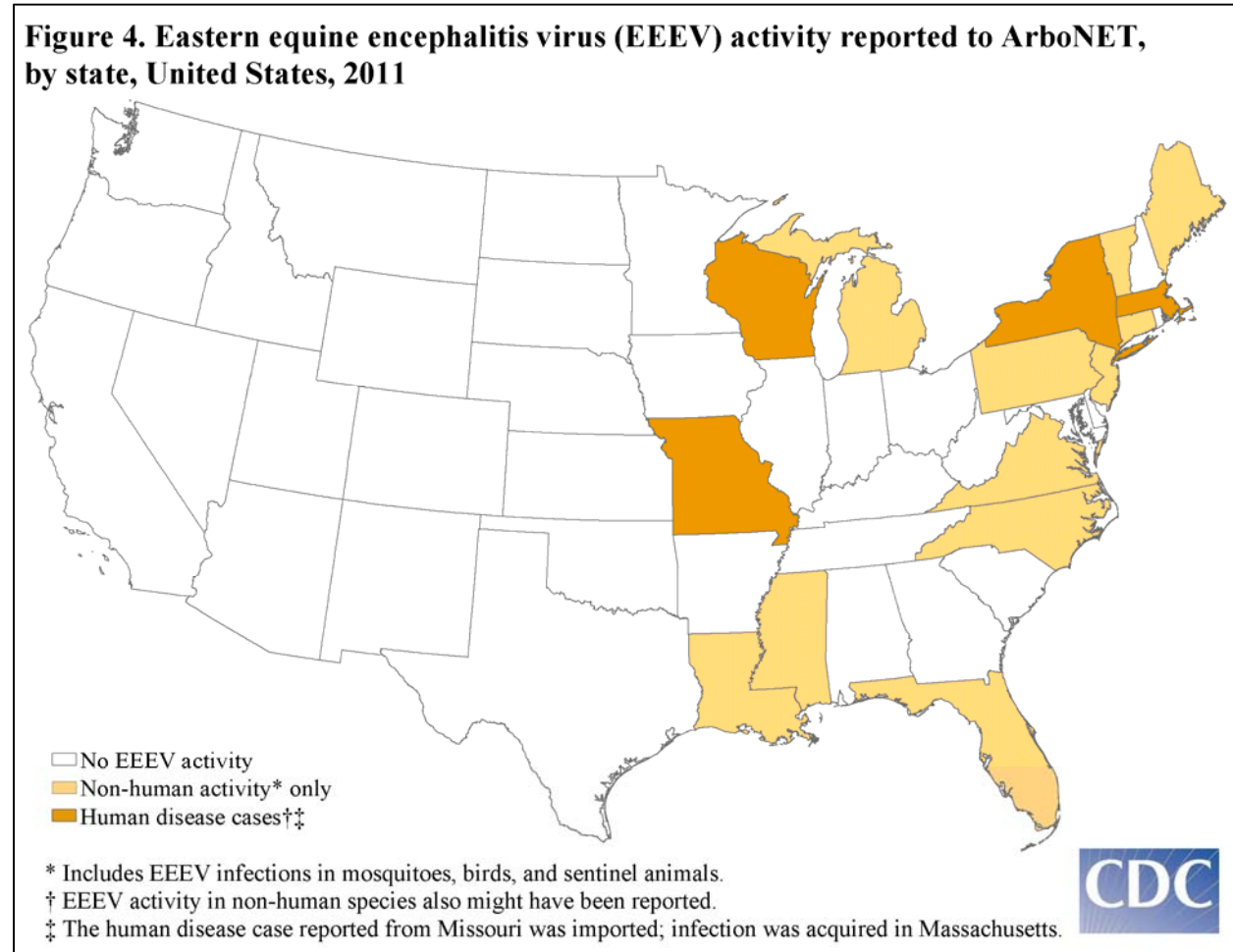


Table 2. Eastern equine encephalitis virus (EEEV) human disease cases reported to ArboNET, United States, 2011

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Massachusetts	1	--¶	1	1
Missouri§	1	--	1	--
New York	1	--	1	1
Wisconsin	1	--	1	1
Totals	4	--	4	3

*Includes confirmed and probable cases.

¶None reported.

§Case is a resident of Missouri; infection was acquired in Massachusetts.

La Crosse virus (LACV) activity in 2011

In 2011, a total of 14 states reported LACV activity to ArboNET; these 14 states reported a total of 130 human disease cases [Figure 5 and Table 3]. Demographic and clinical characteristics of reported cases are described on page 9 [Table 6].

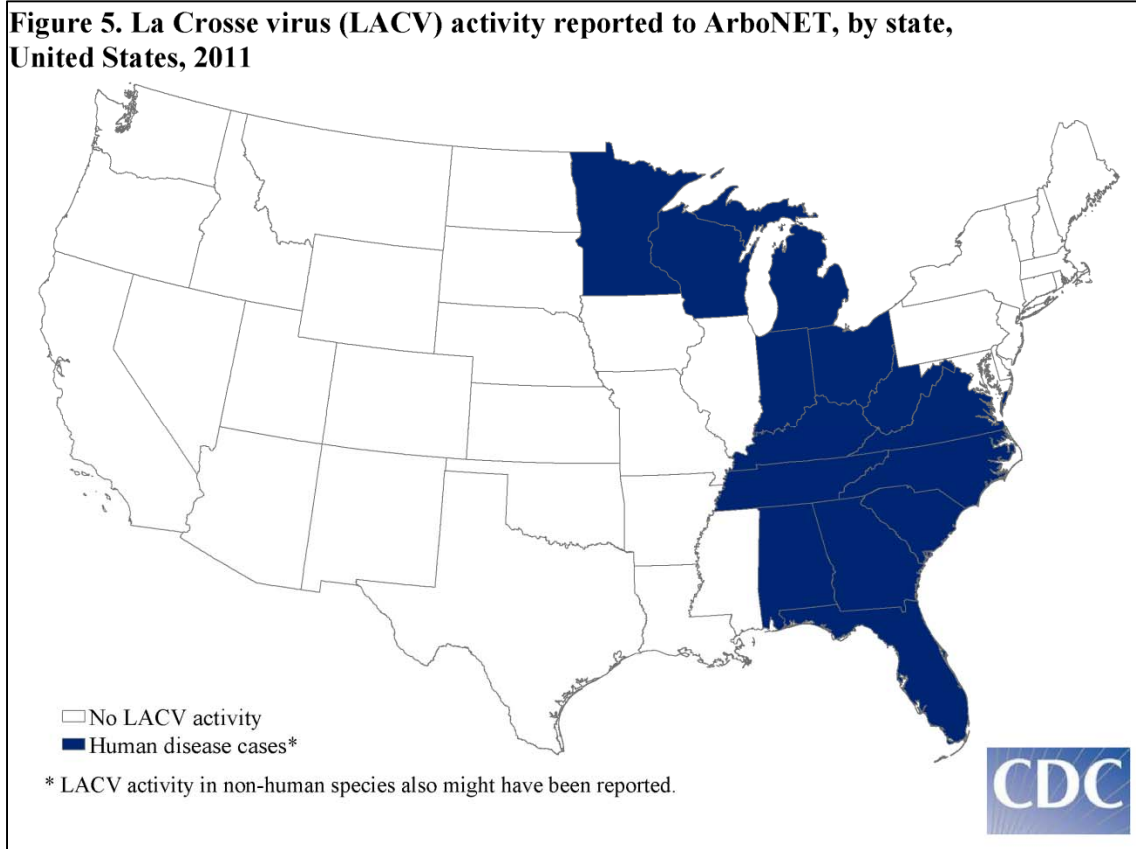


Table 3. La Crosse virus (LACV) human disease cases reported to ArboNET, United States, 2011

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Alabama	1	--¶	1	--
Florida	1	--	1	--
Georgia	2	--	2	--
Indiana	2	--	2	--
Kentucky	1	--	1	--
Michigan	1	--	1	--
Minnesota	1	--	1	--
North Carolina	26	--	26	1
Ohio	44	6	50	--
South Carolina	1	--	1	--
Tennessee	12	--	12	--
Virginia	--	1	1	--
West Virginia	22	4	26	--
Wisconsin	2	3	5	--
Totals	116	14	130	1

*Includes confirmed and probable cases.

¶None reported.

Powassan virus (POWV) activity in 2011

In 2011, three states reported POWV activity to ArboNET; these three states reported a total of 16 human disease cases [Figure 6 and Table 4]. Demographic and clinical characteristics of reported cases are described on page 9 [Table 6].

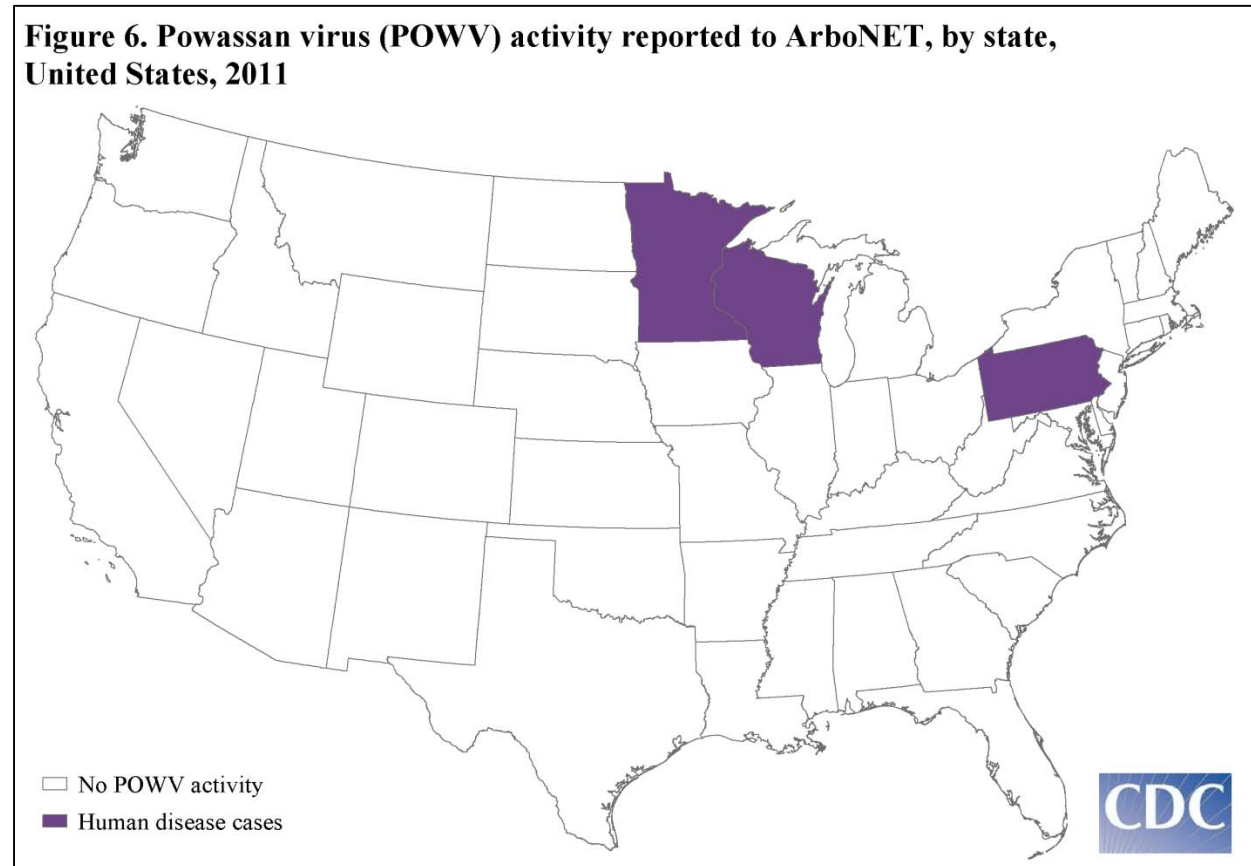


Table 4. Powassan virus (POWV) human disease cases reported to ArboNET, United States, 2011

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Minnesota	9	2	11	1
Pennsylvania	1	--¶	1	--
Wisconsin	2	2	4	--
Totals	12	4	16	1

*Includes confirmed and probable cases.

¶None reported.

St. Louis encephalitis virus (SLEV) activity in 2011

In 2011, six states reported SLEV activity to ArboNET, including four states with reported human disease cases and two additional states with reported SLEV activity in non-human species only [Figure 7 and Table 5].

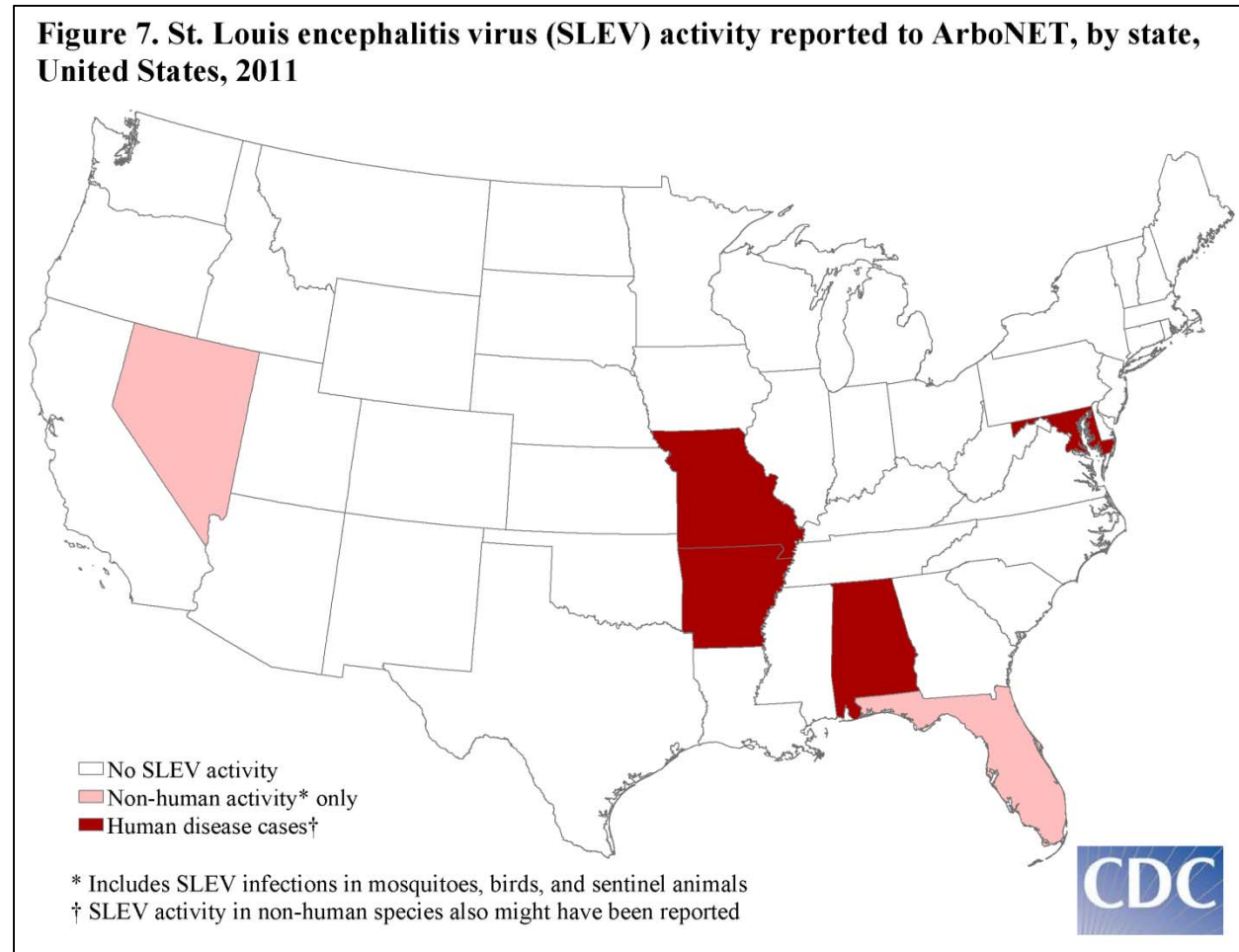


Table 5. St. Louis encephalitis virus (SLEV) human disease cases reported to ArboNET, United States, 2011

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Alabama	1	--¶	1	--
Arkansas	3	--	3	--
Maryland	--	1	1	--
Missouri	--	1	1	--
Totals	4	2	6	--

*Includes confirmed and probable cases.

¶None reported.

Table 6. Characteristics of reported cases of arboviral disease, United States, 2011

	WNV (N=712)		LACV (N=130)		POWV (N=16)	
	No.	(%)	No.	(%)	No.	(%)
Male sex	424	(60)	82	(63)	13	(81)
Age group in years						
<20	25	(4)	123	(95)	3	(19)
20-39	97	(13)	0	(0)	2	(12)
40-49	112	(16)	1	(1)	1	(6)
50-59	155	(22)	3	(2)	3	(19)
≥60	323	(45)	3	(2)	7	(44)
Onset of illness						
January	1	(<1)	0	(0)	0	(0)
February	0	(0)	0	(0)	0	(0)
March	1	(<1)	0	(0)	0	(0)
April	0	(0)	0	(0)	0	(0)
May	3	(<1)	1	(<1)	4	(25)
June	7	(1)	10	(8)	5	(32)
July	91	(13)	40	(31)	4	(25)
August	316	(44)	44	(34)	1	(6)
September	256	(36)	26	(20)	0	(0)
October	34	(5)	9	(7)	1	(6)
November	2	(<1)	0	(0)	1	(6)
December	1	(<1)	0	(0)	0	(0)
Clinical syndrome						
Nonneuroinvasive	226	(32)	14	(11)	4	(25)
Neuroinvasive						
Encephalitis	273	(38)	93	(71)	10	(63)
Meningitis	183	(26)	19	(15)	2	(12)
Acute flaccid paralysis†	30	(4)	4	(3)	0	(0)
Outcome						
Hospitalization	547	(77)	118	(91)	12	(75)
Death	43	(6)	1	(<1)	1	(6)

WNV=West Nile virus; LACV=La Crosse virus; POWV=Powassan virus.

† A total of 21 WNV disease cases classified as acute flaccid paralysis also had encephalitis, seven also had meningitis. All four LACV disease cases classified as acute flaccid paralysis also had encephalitis.



About ArboNET

ArboNET is a national arboviral surveillance system managed by CDC and state health departments. In addition to human disease, ArboNET maintains data on arboviral infections among presumptive viremic blood donors (PVDs), veterinary disease cases, mosquitoes, dead birds, and sentinel animals. As with other national surveillance data, ArboNET data has several limitations that should be considered in analysis, interpretation, and reporting [**Box**].

Box: Limitations of ArboNET data

The following should be considered in the analysis, interpretation, and reporting of ArboNET data:

1. ArboNET is a passive surveillance system. It is dependent on clinicians considering the diagnosis of an arboviral disease and obtaining the appropriate diagnostic test, and reporting of laboratory-confirmed cases to public health authorities. Diagnosis and reporting are incomplete, and the incidence of arboviral diseases is underestimated.
2. Reported neuroinvasive disease cases are considered the most accurate indicator of arboviral activity in humans because of the substantial associated morbidity. In contrast, reported cases of nonneuroinvasive arboviral disease are more likely to be affected by disease awareness and healthcare-seeking behavior in different communities and by the availability and specificity of laboratory tests performed. Surveillance data for nonneuroinvasive disease should be interpreted with caution and generally should not be used to make comparisons between geographic areas or over time.
3. Provisional ArboNET data are provided to help track recent arboviral disease activity. However, these data may change substantially before they are finalized. Provisional data from the current year should not be combined with or compared to final data from previous years.

Additional resources

For additional arboviral disease information and data, please visit the following websites:

- CDC's Division of Vector-Borne Diseases:
www.cdc.gov/ncidod/dvbid/index.html
- National Notifiable Diseases Surveillance System:
http://www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis2011.htm
- U.S. Geological Survey (USGS):
<http://diseasemaps.usgs.gov/>
- AABB (American Association of Blood Banks):
www.aabb.org/programs/biovigilance/Pages/wnv.aspx