



**TEXAS**  
Health and Human  
Services

**Texas Department of State  
Health Services**

# **Arbovirus Activity in Texas, 2002 - 2011**

**October 2018**

**Texas Department of State Health Services  
Infectious Disease Control Unit  
Zoonosis Control Branch**

## **Overview**

Viruses transmitted by mosquitoes are referred to as **arthropod-borne** viruses or arboviruses. Arboviruses reported in Texas included California serogroup viruses (CAL), Cache Valley virus (CVV), dengue virus (DENV), eastern equine encephalitis virus (EEEV), Japanese encephalitis virus (JEV), Saint Louis encephalitis virus (SLEV), western equine encephalitis virus (WEEV), and West Nile virus (WNV), many of which are endemic or enzootic in the state. Between 2002-2011, reported human arboviral disease cases were attributed to WNV (89%), DENV (6%), SLEV (1%), JEV (~1%), and CAL (~1%) (Table 1). In addition, there were 91 (4%) cases attributed to unspecified arboviruses. Animal infections or disease caused by EEEV, WEEV, and WNV were also reported during this time frame.

**Table 1. 2002-2011 Arbovirus Activity Summary, Texas**

Arbovirus	Positive Mosquito Pools	Avian	Equine	Sentinel Chicken	Human**							TOTAL
					Fever	Neuro-invasive	Other*	Severe	TOTAL (Human)	Deaths	PVDs‡	
CAL	11				0	2			2	0		13
CV	1				0	0			0	0		1
DEN	0				146	0		1	147	0		147
EEE	0	12	62	19	0	0			0	0		93
JE	0				0	2			2	0		2
SLE	71	0		0	3	27	18		48	0		119
WEE	8	0	1	0	0	0			0	0		9
WN	6,225	1,727	2,811	21	689	1,513			2,202	135	286	12,986
<b>TOTAL</b>	<b>6,316</b>	<b>1,739</b>	<b>2,874</b>	<b>40</b>	<b>838</b>	<b>1,544</b>	<b>18</b>	<b>1</b>	<b>2,401</b>	<b>135</b>	<b>286</b>	<b>13,370</b>

CAL - California serogroup includes California encephalitis, Jamestown Canyon, Keystone, La Crosse, Snowshoe hare and Trivittatus viruses

CV - Cache Valley

DEN - Dengue

EEE - Eastern equine encephalitis

JE - Japanese encephalitis

SLE - Saint Louis encephalitis

WEE - Western equine encephalitis

WN - West Nile

\*Clinical syndrome designation for SLE was not reported in 2002

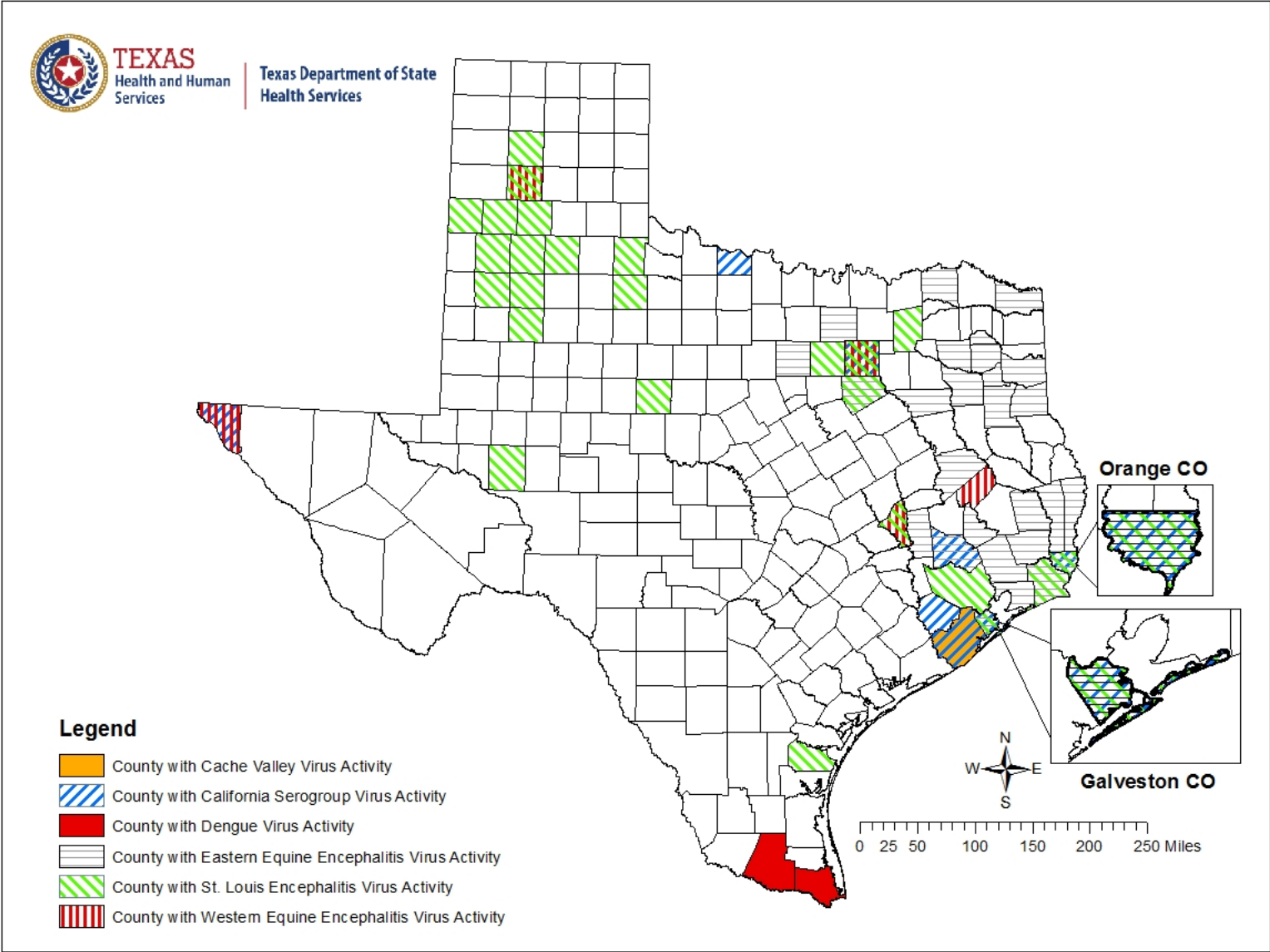
\*\*Does not include 91 cases attributed to unspecified arboviruses

‡PVD - Presumptive viremic blood donors are people who had no symptoms at the time of donating blood through a blood collection agency, but whose blood tested positive when screened for the presence of WN virus. Unless they meet the case reporting criteria, they are not counted as a case for official reporting purposes and are not included in the "Total" columns.

## **Cache Valley Virus**

Cache Valley virus is a bunyavirus maintained in a cycle between a variety of mosquito species and mammals, including sheep and cattle. It is widely spread throughout North and Central America. Human disease from CVV is rare, with only a few cases reported in the United States (U.S.). From 2002-2011, one CVV-positive mosquito pool was reported in Brazoria County (Figure 1).

**Figure 1. Texas Counties Reporting Arbovirus Activity\* in Any Species, 2002-2011**



\* Indicated by an arbovirus-positive bird, mosquito pool, sentinel chicken, horse, or human (mosquito-transmitted disease case or presumptive viremic donor). Absence of reported activity from counties may be due to absence of a surveillance program for non-human cases. Excludes West Nile virus (see Figure 9).

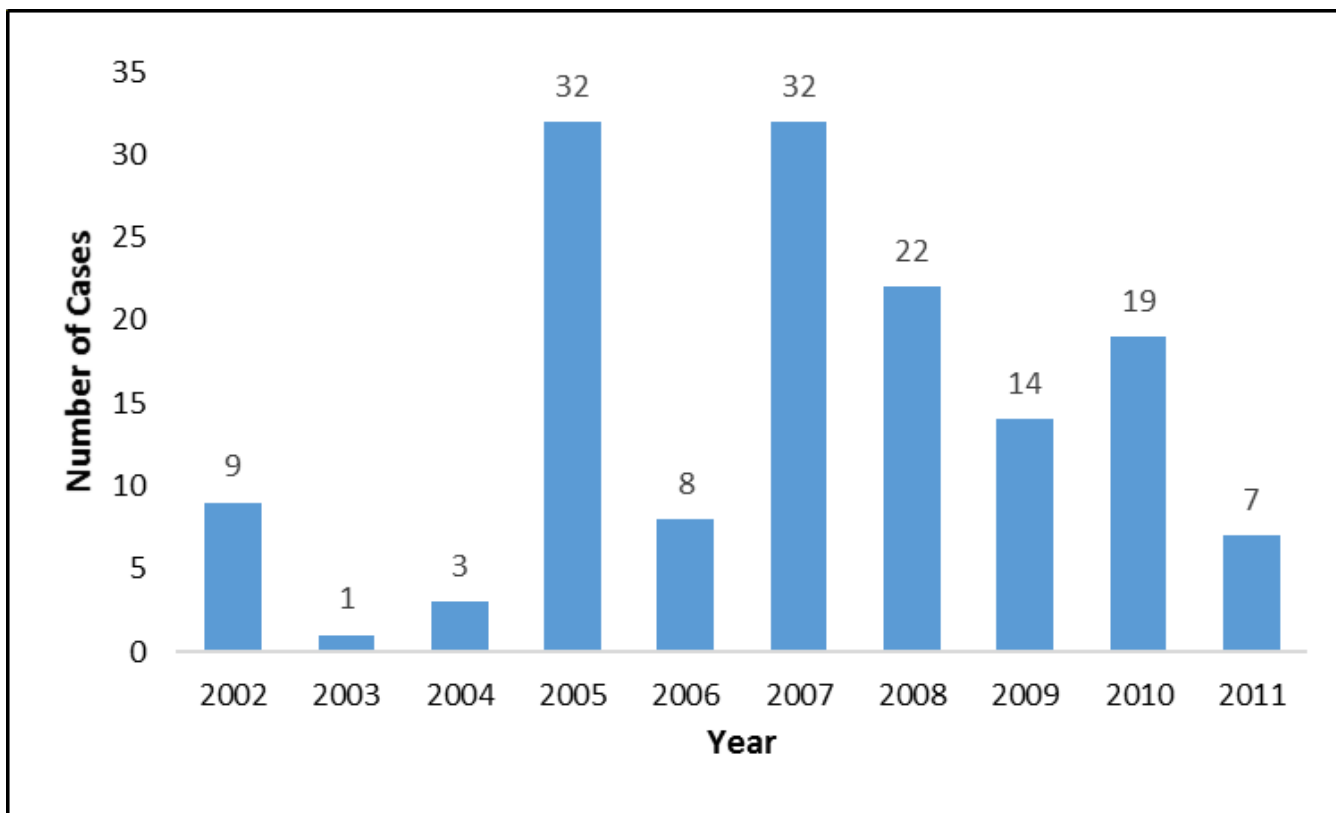
## **California Serogroup Viruses**

California serogroup viruses are bunyaviruses and include California encephalitis virus (CEV), Jamestown Canyon virus, Keystone virus, La Crosse virus (LACV), Snowshoe hare virus, and Trivittatus virus. These viruses are maintained in a cycle between mosquito vectors and vertebrate hosts in forest habitats. In the U.S., approximately 80-100 reported cases of human neuroinvasive disease are caused by LACV each year (CDC), mostly in mid-Atlantic and southeastern states. From 2002-2011, Texas reported two cases of human CAL neuroinvasive disease (range: 0-1 cases/year): one case of CEV neuroinvasive disease reported in 2002 from Galveston County (unknown travel history), and one case of LACV neuroinvasive disease reported in 2010 from Kleberg County in a person who was exposed in Tennessee. In addition to human cases, Texas reported a total of 11 CAL-positive mosquito pools: 9 mosquito pools positive for non-LACV California serogroup viruses, and 2 pools positive for LACV (Figure 1).

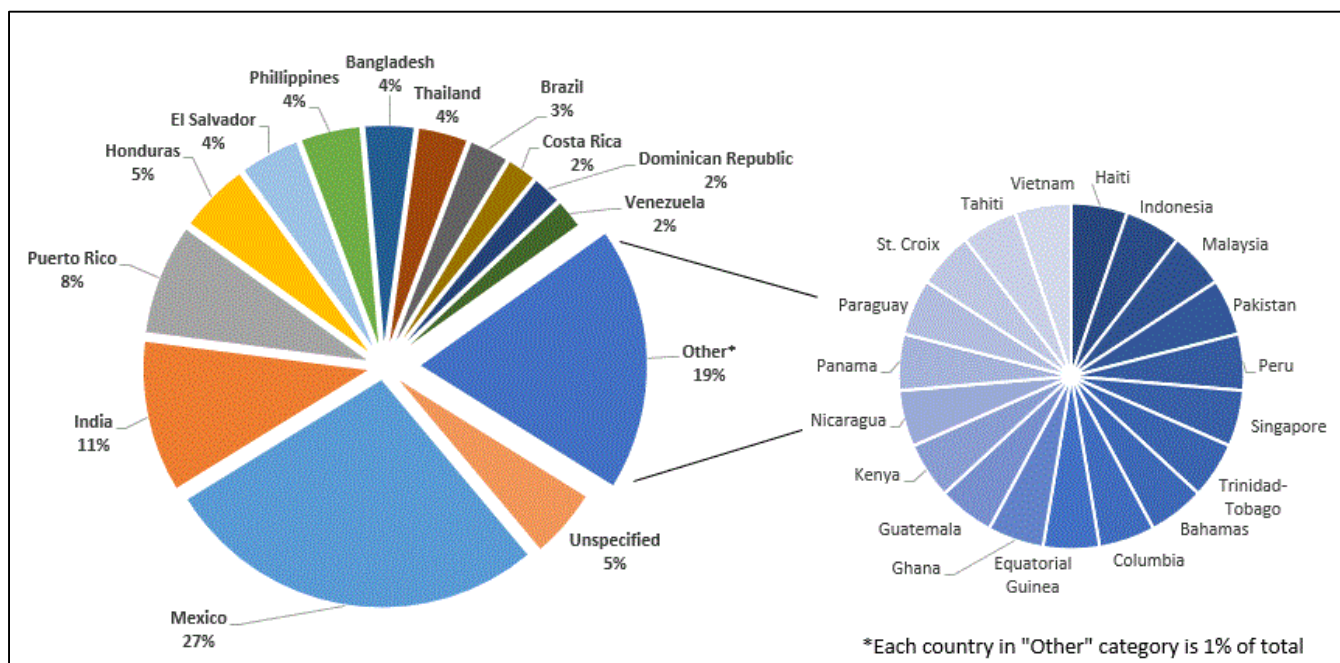
## **Dengue Virus**

Dengue virus is a flavivirus that is maintained in a cycle between *Aedes aegypti* or *Ae. albopictus* mosquitoes and human hosts. It is re-emerging throughout the tropical and subtropical Americas, including northern Mexico. Human cases are most often imported into the U.S. as a result of travel to a dengue-endemic country, but locally-acquired cases have been reported in Florida, Hawaii, and Texas (CDC). From 2002-2011, Texas reported a total of 147 cases of dengue (annual median = 12 cases, range: 1-32 cases/year) (Figure 2). The majority of dengue cases (139) reported were travel-associated, with most reporting travel to Mexico (27%), India (11%), Puerto Rico (8%), and Honduras (5%) (Figure 3). The specific country of exposure could not be determined for 7 travel-associated cases who reported travel to multiple dengue-endemic countries or where only continent of travel was provided. During this time period, 5 cases of locally-acquired dengue were reported from the Lower Rio Grande Valley region of Texas: 4 in Cameron County [2004 (1), 2005 (3)], and 1 in Hidalgo County (2008) (Figure 1). The location of dengue exposure (whether locally-acquired or travel-associated) could not be determined for 3 cases.

**Figure 2. Reported Dengue Cases by Year, Texas, 2002-2011 (N=147)**



**Figure 3. Reported Cases of Dengue by Country of Travel, Texas, 2002-2011 (N=139)**

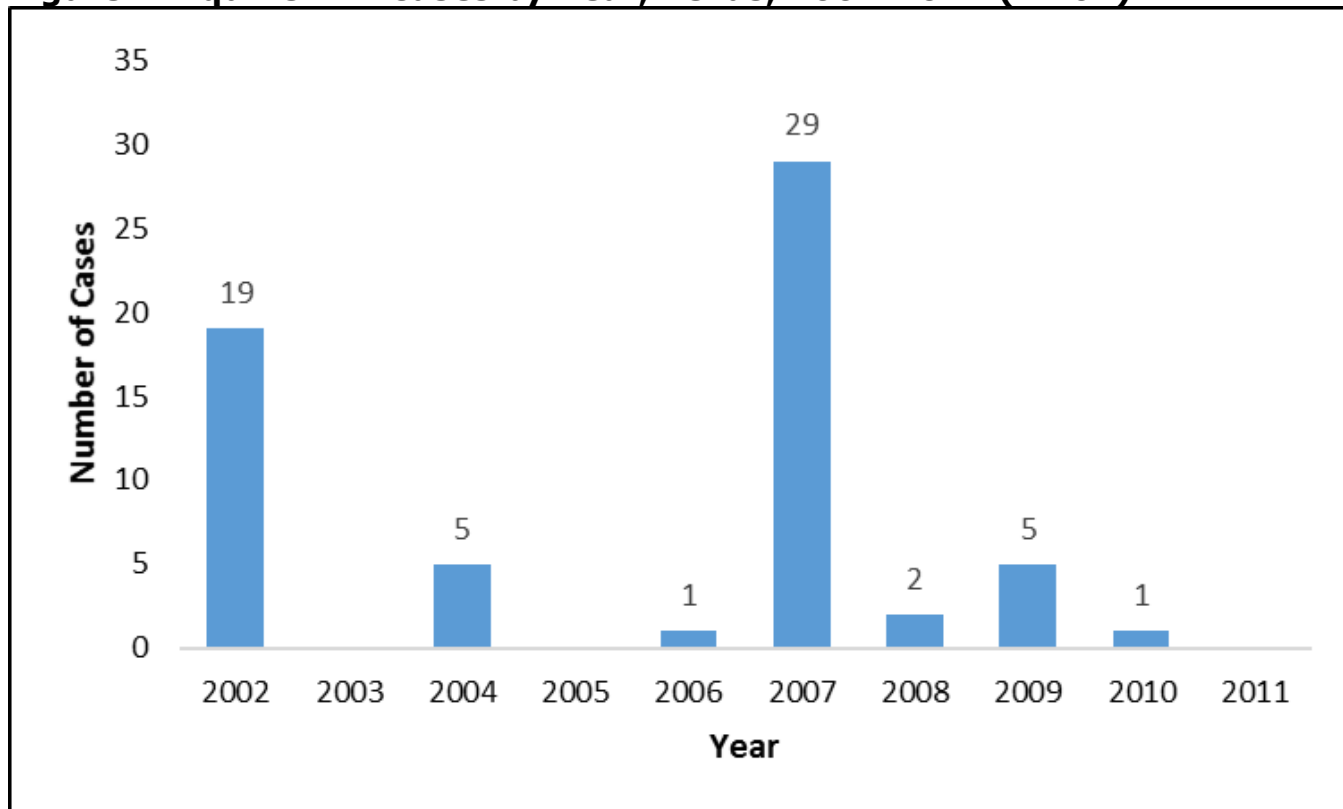


### **Eastern Equine Encephalitis Virus**

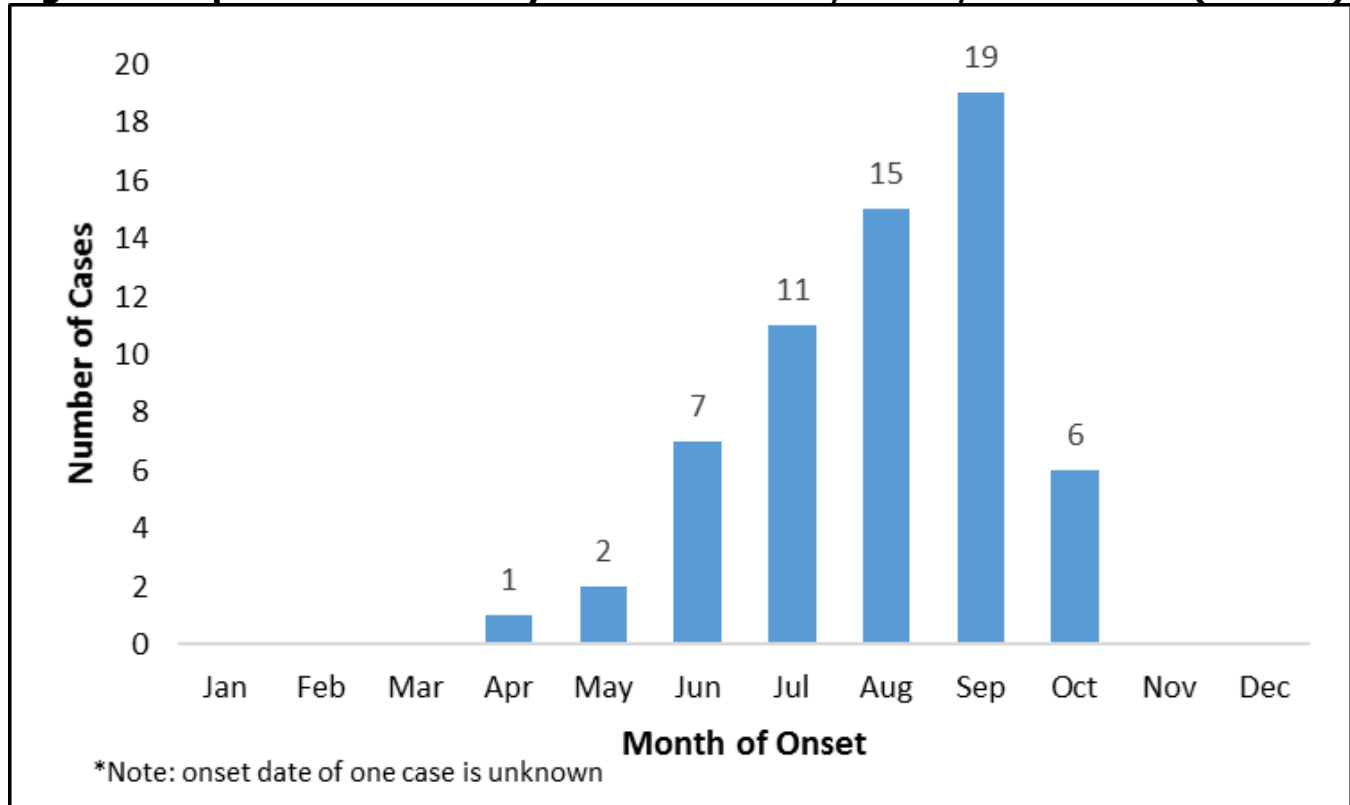
Eastern equine encephalitis virus is an alphavirus maintained in a cycle between *Culiseta melanura* mosquitoes and avian hosts in freshwater swamps. *Culiseta melanura* is not considered to be an important vector of EEEV to humans because it feeds almost exclusively on birds. Transmission to humans requires mosquito species capable of creating a “bridge” between infected birds and uninfected mammals, such as some *Aedes*, *Coquillettidia*, and *Culex* species. Eastern equine encephalitis (EEE) is a rare illness in humans, and only a few cases are reported in the U.S. each year. Most cases of EEE have been reported from Florida, Georgia, Massachusetts, and New Jersey (CDC). Portions of northeast Texas bordering Louisiana contain habitat suitable for EEEV transmission and EEEV-infected horses have been reported from this part of the state (Figure 1).

From 2002-2011, EEEV infection was reported in 12 dead birds and 62 horses from 27 counties (Figure 1). Almost half (47%) of the equine cases of EEE occurred in 2007 during an outbreak involving 15 counties (Figure 4). The onset dates for 52 (84%) of the equine EEE cases were between June and September (Figure 5). In addition, Galveston County reported 19 EEEV antibody-positive sentinel chickens in 2010 (Galveston County is the only Texas county which tested sentinel chickens for EEEV antibodies). No EEEV-infected humans or mosquitoes were reported during this time frame.

**Figure 4. Equine EEE Cases by Year, Texas, 2002-2011 (N=62)**



**Figure 5. Equine EEE Cases by Month of Onset, Texas, 2002-2011 (N=61\*)**



### **Japanese Encephalitis Virus**

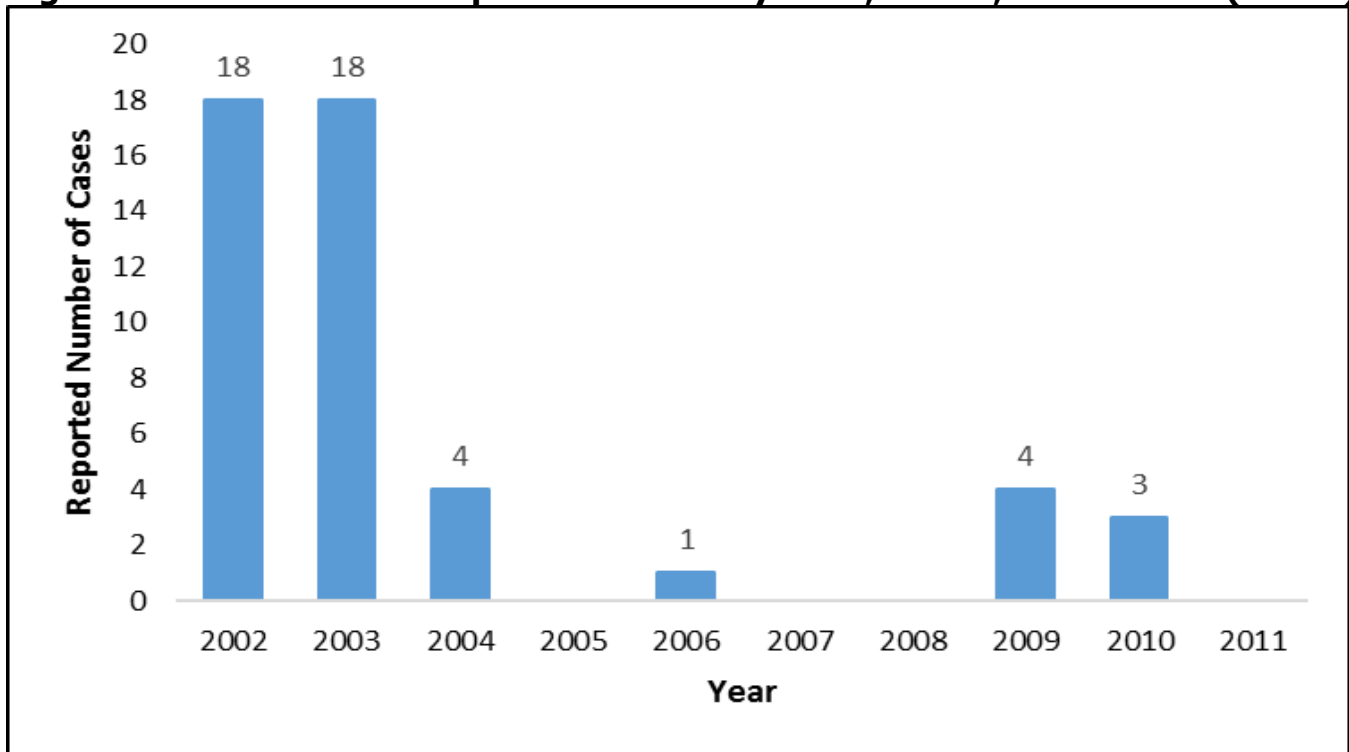
Japanese encephalitis virus is a flavivirus maintained in a cycle between mosquitoes (primarily *Culex* species) and vertebrate hosts, mainly pigs and birds. It is the leading cause of vaccine-preventable encephalitis in Asia and the western Pacific (CDC). Fewer than 1% of people who are infected will develop signs and symptoms. Japanese encephalitis is not endemic in the US, but it is occasionally reported in returning travelers. From 2002-2011, Texas reported 2 travel-associated cases of Japanese encephalitis.

### **Saint Louis Encephalitis Virus**

Saint Louis encephalitis virus is a flavivirus maintained in a cycle between *Culex* species mosquitoes and birds. The geographic range of SLEV extends from North to South America, but the majority of cases have occurred in the eastern and central U.S., where periodic epidemics have occurred since the 1930s (CDC). In Texas and states with milder climates, SLEV can circulate year-round. Between 2002 and 2011, evidence of SLEV activity in any species was reported from 25 (10%) of the 254 counties in Texas: 4 (2%) counties reported SLE-positive mosquito pools, and 24 (9%) counties reported human SLE disease cases (Figure 1). Forty-eight cases of human disease caused by SLEV were reported (annual median = 1 case, range: 0-18 cases/year) (Figure 6). Twenty-seven (56%) cases were classified as neuroinvasive, and 3 (6%) were uncomplicated febrile illnesses; the clinical syndrome was not reported for 18 (38%) cases. The majority of cases (77%)

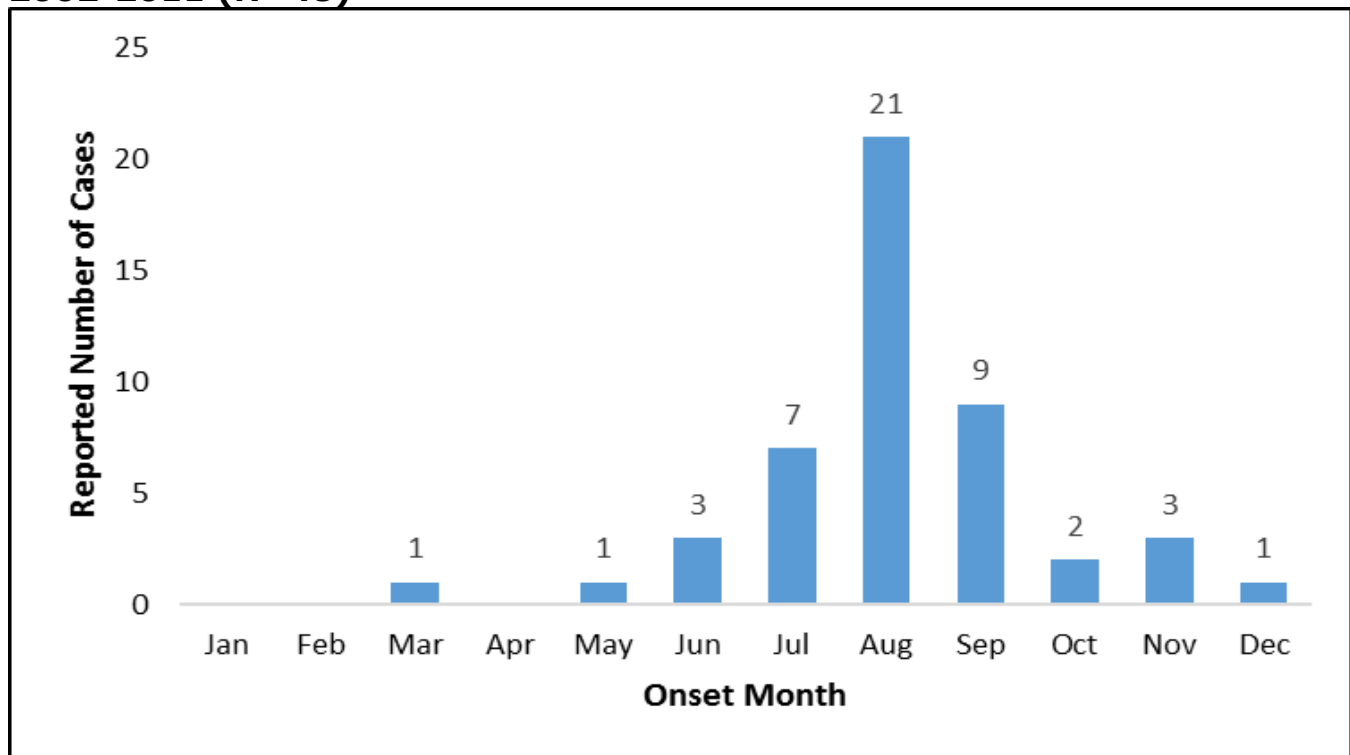
reported onset of illness between July and September (Figure 7). During that same time period, 71 SLEV-positive mosquito pools were reported.

**Figure 6. Saint Louis Encephalitis Cases by Year, Texas, 2002-2011 (N=48)**





**Figure 7. Saint Louis Encephalitis Cases by Month of Illness Onset, Texas, 2002-2011 (N=48)**



**Western Equine Encephalitis Virus**

Western equine encephalitis virus is an alphavirus maintained in a cycle between *Culex tarsalis* mosquitoes and avian hosts. Western equine encephalitis (WEE) is a rare illness in humans, and the last confirmed human case in the U.S. was reported in 1999.

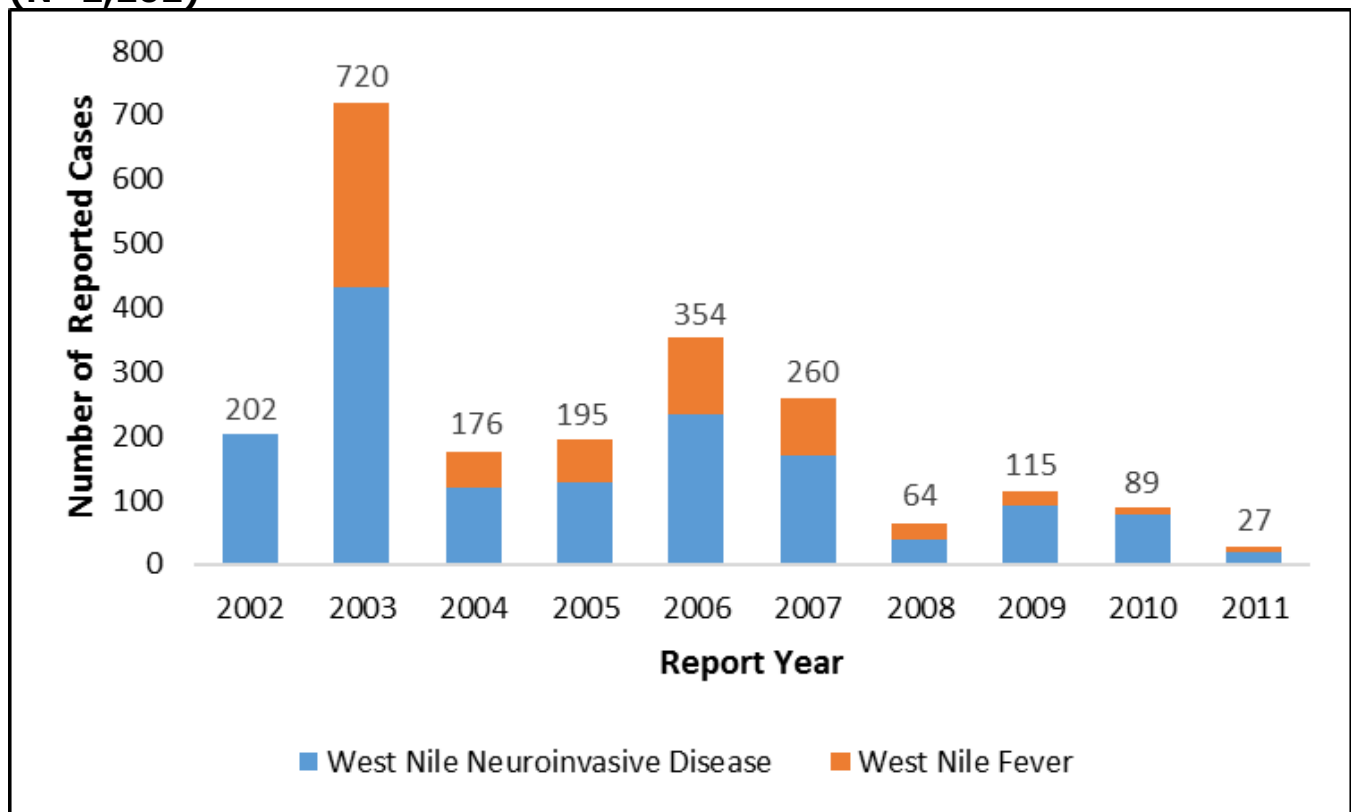
From 2002-2011, evidence of WEEV activity in any species was reported from 5 (2%) of the 254 counties in Texas: 4 (2%) counties reported WEE-positive mosquito pools, and 1 (~1%) county reported an equine WEE disease case (Figure 1). No WEEV-infected humans or birds were reported during this time frame.

**West Nile Virus**

West Nile virus is a flavivirus maintained in a cycle between mosquitoes (primarily *Culex* species) and birds. West Nile virus circulates on every continent except Antarctica. Before 1999, WNV had not been documented in the Western Hemisphere. In 1999, human disease associated with WNV infection was identified in New York City. By the end of October 1999, WNV infections had been confirmed in multiple native species of birds as well as horses from New York City and areas within a 200-mile radius. Testing methods, diagnostic capacity, surveillance strategies, and reporting requirements changed rapidly after recognition of this emerging disease threat. Since 1999, WNV infections in humans, birds, equines, other animals, and mosquitoes have been reported throughout the U.S. The first WNV vaccine for horses in the U.S. was introduced in 2001.

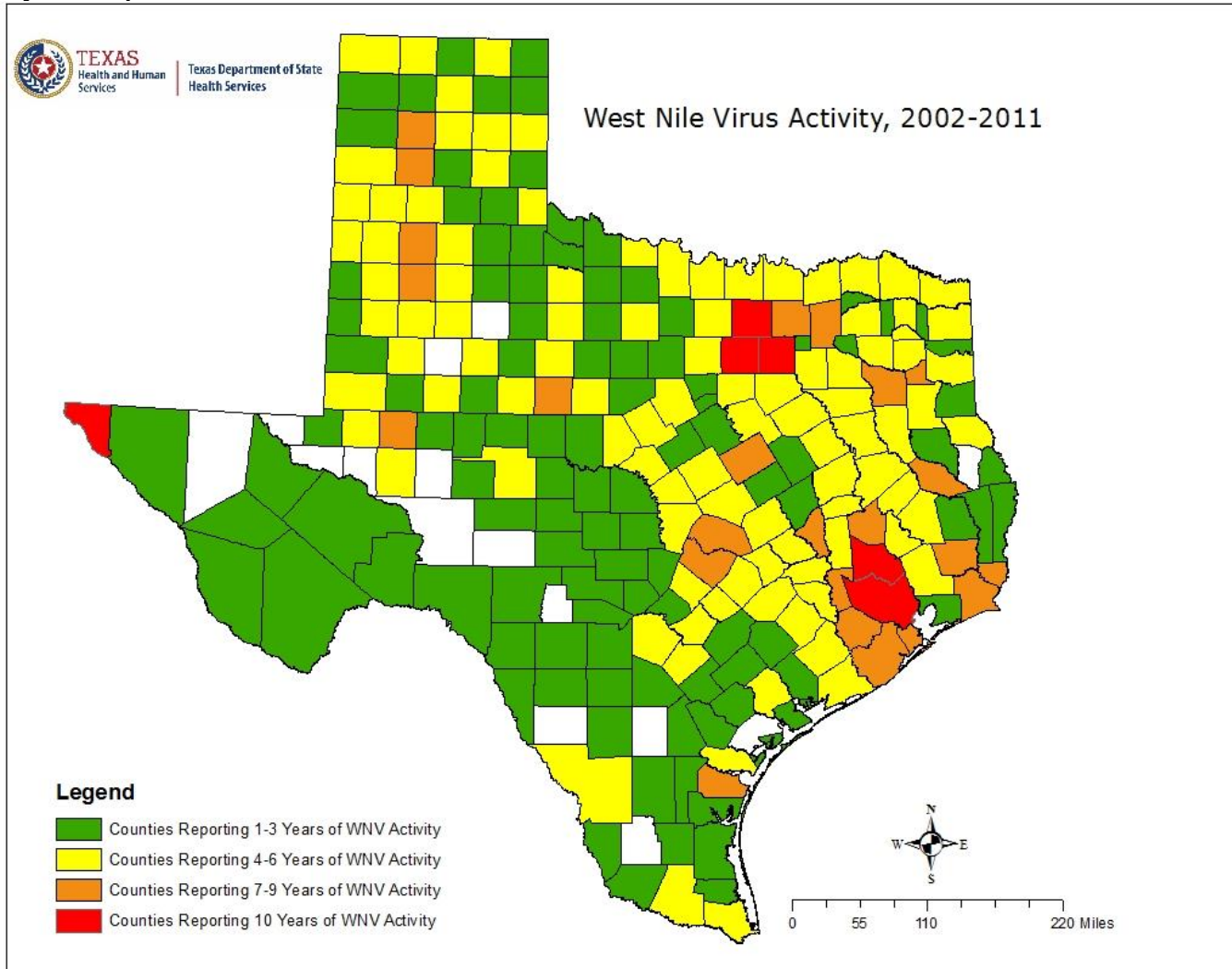
West Nile virus activity was first reported in Texas in 2002. Initially, only WN neuroinvasive disease (WNND) was reportable in humans; West Nile fever (WNF) became a reportable condition in 2003. From 2002-2011, a total of 2,202 human WNV disease cases were reported in Texas (annual median = 186 cases, range: 27-720 cases/year) (Figure 8). In 2011, Texas reported 27 WNV disease cases, its lowest since 2002. Of the 2,202 WNV disease cases, 1,513 (69%) were WNND and 689 (31%) were WNF. Additionally, there were 286 presumptive viremic donors (PVDs) reported by blood collection agencies (Table 1).

**Figure 8. Human West Nile Disease Cases by Year, Texas, 2002-2011 (N=2,202)**



Between 2002 and 2011, evidence of WNV activity in any species (human, horse, bird, mosquito, or other animal) was reported from 239 (94%) of the 254 counties in Texas (Figure 9). Forty-two (12%) counties reported WNV-positive mosquito pools, 163 (64%) counties reported human WNV disease cases, 138 (54%) counties reported presumptive viremic blood donors (PVDs), 234 (92%) counties reported WNV-infected horses, 87 (34%) counties reported WNV-positive birds, and 2 (1%) counties reported WNV-positive sentinel chickens (Table 2).

**Figure 9. Texas Counties Reporting West Nile Virus Activity\* in Any Species, 2002-2011**



\*Indicated by an WNV-positive bird, mosquito pool, sentinel chicken, horse, other animal, or human (disease case or presumptive viremic donor). Absence of WNV activity from counties may be due to absence of an active surveillance program.

From 2002-2011, WNV infection was reported in 6,225 mosquito pools, 1,727 birds, 2,811 equines, 2 camelids, 1 canine, 21 sentinel chickens, and 7 unspecified species (Table 2). The majority (57%) of equine WNV disease cases were reported in 2002 (Figure 10). Eighty-four percent of equine WNV disease cases had onsets of illness between August and October (Figure 11).

**Table 2. WNV Activity Reported by Species and County, Texas, 2002-2011**

County	WNV							COUNTY TOTAL	
	M	A	E	SC	H				
					WNF	WNND	PVD#		TOTAL
Anderson		1	6			1		1	8
Andrews		1	6		6	7		13	20
Angelina		7	19		11	28	2	39	65
Aransas	1		2					0	3
Archer		1	15					0	16
Armstrong			15			1		1	16
Atascosa			3					0	3
Austin			6					0	6
Bailey		1	3		5	5		10	14
Bandera			2					0	2
Bastrop		2	9		1			1	12
Baylor			3					0	3
Bee			5				1	0	5
Bell	9	3	27		1	2	1	3	42
Bexar	2	23	13		8	26	13	34	72
Blanco			3					0	3
Bosque			6					0	6
Bowie		9	16			3	1	3	28
Brazoria	41	26	27		2	2		4	98
Brazos	87	32	19		12	18	2	30	168
Brewster			1					0	1
Briscoe			11		1			1	12
Brooks			3					0	3
Brown		6	15		1	1		2	23
Burleson			4		1			1	5
Burnet			18		1	1		2	20
Caldwell			9			2		2	11
Calhoun			2					0	2
Callahan			18		3	3		6	24
Cameron	4	6	7		12	14	1	26	43
Camp		2	5				1	0	7
Carson			9		3	1	2	4	13
Cass		3	9					0	12

County	WNV							COUNTY TOTAL	
	M	A	E	SC	H				
					WNF	WNND	PVD#		TOTAL
Castro			16		19	4	1	23	39
Chambers		3	7			1	1	1	11
Cherokee		1	13			2		2	16
Childress			5			3		3	8
Clay			11			3		3	14
Cochran	6		1		3	2		5	12
Coke			5		1			1	6
Coleman			4			1		1	5
Collin	42	7	43		7	24	6	31	123
Collingsworth			2		1			1	3
Colorado		1	4		1			1	6
Comal			3		1			1	4
Comanche	1		17			1		1	19
Concho			1					0	1
Cooke		1	28		2	7		9	38
Coryell	1		17			1	1	1	19
Cottle			6					0	6
Crosby			5		7	8	1	15	20
Dallam			14		3	1		4	18
Dallas	632	70	42	15	65	198	25	263	1,022
Dawson			11		1	2		3	14
Deaf Smith			23		8	6	1	14	37
Delta			3					0	3
Denton	73	9	84		11	22	8	33	199
DeWitt	1				1		1	1	2
Dickens			6			1	1	1	7
Donley		2	6		1	3		4	12
Duval			4					0	4
Eastland			21					0	21
Ector			26		7	8	2	15	41
Edwards			4					0	4
El Paso	102	3	3		35	168	38	203	311
Ellis	4	4	29			7	1	7	44

County	WNV							COUNTY TOTAL	
	M	A	E	SC	H				
					WNF	WNND	PVD#		TOTAL
Erath		2	54			2		2	58
Falls			12			1		1	13
Fannin		2	16					0	18
Fayette			7					0	7
Fisher			5		1			1	6
Floyd			9		6	5	1	11	20
Foard						1		1	1
Fort Bend	16	1	15		1	6		7	39
Franklin		1	3		1		2	1	5
Freestone			11			3		3	14
Frio			3			1	1	1	4
Gaines			1		3			3	4
Galveston	38	4	29		1	9	2	10	81
Garza			4			1	1	1	5
Gillespie			3					0	3
Glasscock			3		1		1	1	4
Goliad			1					0	1
Gonzales			5					0	5
Gray			13			4		4	17
Grayson		3	18		1	1	1	2	23
Gregg	16	9	11		7	9	1	16	52
Grimes			12					0	12
Guadalupe			3			1	1	1	4
Hale	1	2	14		29	19	3	48	65
Hall			5		1	1		2	7
Hamilton			10					0	10
Hansford		1	13		4	1	1	5	19
Hardeman			3			1		1	4
Hardin		4	16		2	3	2	5	25
Harris	3569	1,242	62		49	303	51	352	5,225
Harrison		6	6		1	2		3	15
Hartley			8		1			1	9
Haskell			9		2	2		4	13

County	WNV							COUNTY TOTAL	
	M	A	E	SC	H				
					WNF	WNND	PVD#		TOTAL
Hays			10				0	10	
Hemphill			5			1	1	6	
Henderson			12		1	2	3	15	
Hidalgo		1	5		8	18	1	26	32
Hill			12			2	2	2	14
Hockley	9		16		4	8	3	12	37
Hood		2	30			1	1	1	33
Hopkins		1	14		2	1	3	3	18
Houston		1	8			1	1	1	10
Howard		5	3		1	1	2	2	10
Hudspeth			1			1	1	1	2
Hunt		3	30		2	7	2	9	42
Hutchinson			9		1	4	5	5	14
Irion			1				0	0	1
Jack			5			1	1	1	6
Jackson			1				0	0	1
Jasper			10			1	1	1	11
Jeff Davis			2			1	1	1	3
Jefferson	156	11	12		12	46	58	58	237
Jim Wells	1		7		2	1	3	3	11
Johnson		9	55			5	1	5	69
Jones			25		3	3	6	6	31
Karnes			4				0	0	4
Kaufman			26		1	3	1	4	30
Kendall			5				0	0	5
Kenedy			1				0	0	1
Kerr			5				0	0	5
Kimble			2				0	0	2
King						1	1	1	1
Kinney			1				0	0	1
Kleberg			1			1	1	1	2
Knox		1	8			2	2	2	11
La Salle			3				0	0	3

County	WNV								COUNTY TOTAL
	M	A	E	SC	H				
					WNF	WNND	PVD#	TOTAL	
Lamar		1	12			1		1	14
Lamb		1	8		14	6		20	29
Lampasas			17					0	17
Lavaca			3					0	3
Lee			5		1			1	6
Leon		1	7		1			1	9
Liberty		4	22		1	3	1	4	30
Limestone			13			1		1	14
Lipscomb			4		1		1	1	5
Live Oak			3					0	3
Llano			4					0	4
Lubbock	78	19	43	6	32	57	15	89	235
Lynn			5		1	1	1	2	7
Madison		1	12					0	13
Marion			1					0	1
Martin			1					0	1
Mason			6					0	6
Matagorda		4	5					0	9
Maverick			2			1		1	3
McCulloch			2		1			1	3
McLennan	20	8	57		1	9	1	10	95
Medina			5					0	5
Menard			1					0	1
Midland	6	2	24		11	8	3	19	51
Milam		1	5			2		2	8
Mills			7		1			1	8
Mitchell			2					0	2
Montague			31					0	31
Montgomery	247	25	51		8	48	8	56	379
Moore			12			2	1	2	14
Morris		1	3					0	4
Motley			2			2		2	4
Nacogdoches		2	9			2	1	2	13



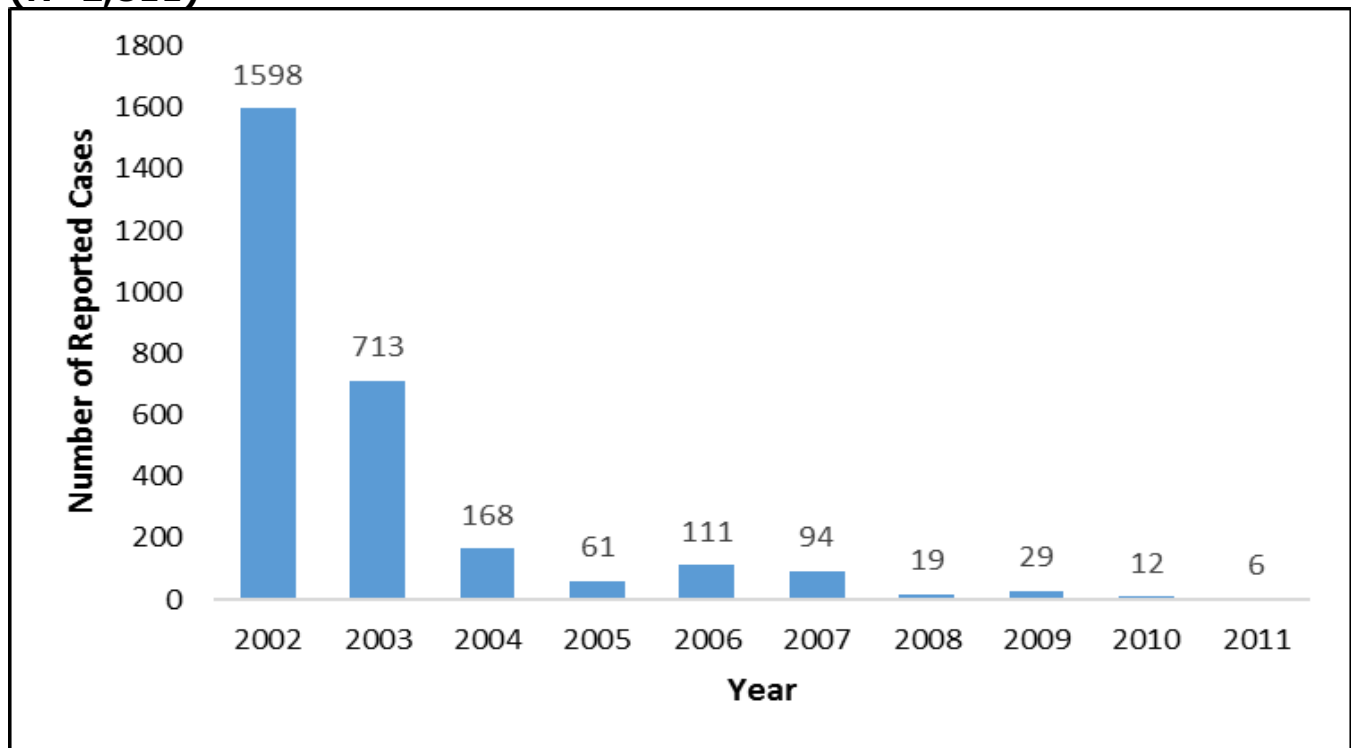
County	WNV								COUNTY TOTAL
	M	A	E	SC	H				
					WNF	WNND	PVD#	TOTAL	
Navarro		1	15		2	2	1	4	20
Newton			2			1		1	3
Nolan		3	6		1		1	1	10
Nueces	527		11		17	21	2	38	576
Ochiltree			5		2	1		3	8
Oldham			6		1	2		3	9
Orange	21	1	10		5	21	2	26	58
Palo Pinto			8			1		1	9
Panola	1	1	6		1	4		5	13
Parker			71					0	71
Parmer		1	3		10	6	2	16	20
Pecos			3			1	1	1	4
Polk			8		1	1		2	10
Potter	5	3	22		11	8	15	19	49
Presidio			2					0	2
Rains			1					0	1
Randall	15	4	70		34	28	7	62	151
Red River		1	7					0	8
Reeves			1					0	1
Roberts			3			1		1	4
Robertson		1	6					0	7
Rockwall			13					0	13
Runnels			1					0	1
Rusk		2	14		3	2	1	5	21
Sabine			3					0	3
San Jacinto		1	4					0	5
San Patricio	22		4		3	5		8	34
San Saba			5					0	5
Schleicher			1					0	1
Scurry			4		2	2		4	8
Shackelford			4			1		1	5
Shelby		1	7					0	8
Sherman			11		1	3		4	15

County	WNV								COUNTY TOTAL
	M	A	E	SC	H				
					WNF	WNND	PVD#	TOTAL	
Smith	16	12	31		7	9		16	75
Somervell			4					0	4
Starr			2			2		2	4
Stephens			3		1	2		3	6
Sterling						1		1	1
Stonewall		1	13			1		1	15
Swisher		3	12		11	4		15	30
Tarrant	226	14	72		77	90	19	167	479
Taylor	14	5	70		2	10		12	101
Terrell			1		1			1	2
Terry			5		1	2	2	3	8
Throckmorton			3					0	3
Titus		1	15		1	3		4	20
Tom Green	4		12		1	2		3	19
Travis	195	27	24		15	29	4	44	290
Trinity			7			1		1	8
Tyler					1	1		2	2
Upshur		6	11		1			1	18
Upton			3				1	0	3
Uvalde			8					0	8
Val Verde			11					0	11
Van Zandt		6	18			1		1	25
Victoria		3	1			1	1	1	5
Walker		1	10		1	4		5	16
Waller			17			3		3	20
Washington			20		1	2	1	3	23
Webb	1		5		1	4		5	11
Wharton		8	4			2		2	14
Wheeler			10					0	10
Wichita	13	7	39		2	5	2	7	66
Wilbarger			9					0	9
Willacy			3		2	1		3	6
Williamson	1	4	41		2	1	1	3	49

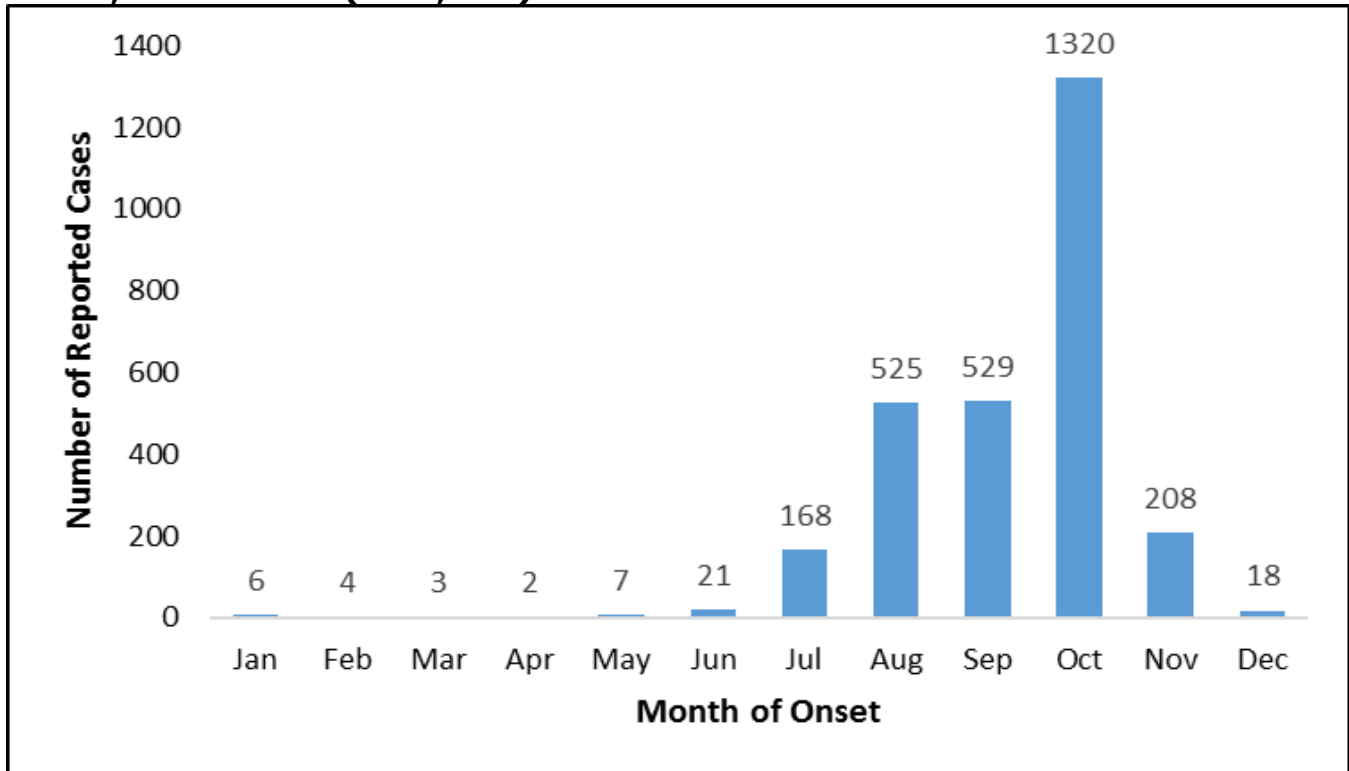
County	WNV								COUNTY TOTAL
	M	A	E	SC	H				
					WNF	WNND	PVD‡	TOTAL	
Wilson			8		1			1	9
Winkler			2					0	2
Wise			63				1	0	63
Wood	1	3	19			1		1	24
Yoakum			1					0	1
Young		1	16		1	1	1	2	19
Zapata			3		2			2	5
Zavala			1					0	1
<b>Total Number of Reports</b>	<b>6,225</b>	<b>1,727</b>	<b>2,811</b>	<b>21</b>	<b>689</b>	<b>1,513</b>	<b>286</b>	<b>2,202</b>	<b>15,474</b>

M-Mosquito A-Avian E-Equine SC-Sentinel Chicken H-Human  
WNV-West Nile Virus WNF-West Nile Fever WNND-West Nile Neuroinvasive Disease  
PVD-Presumptive Viremic Blood Donor  
‡PVDs are not included in any of the "Total" columns.

**Figure 10. Equine West Nile Virus Disease Cases by Year, Texas, 2002-2011 (N=2,811)**



**Figure 11. Equine West Nile Virus Disease Cases by Month of Illness Onset, Texas, 2002-2011 (N=2,811)**



Additional analysis of human WN disease data was performed. Of the reported cases with WNND, 1,053 (70%) presented with encephalitis, including meningoencephalitis, and 460 (30%) presented with meningitis only (Table 3). The median age at onset of illness was 54 years (range: 0-99 years) for all cases. Case patients with WNND tended to be slightly older (median = 58 years, range: 0-99 years), while case patients with WNF were slightly younger (median = 49 years, range: 5-93 years). The majority (55%) of all WNV disease cases were non-Hispanic whites, followed by Hispanics (24%). The majority of WNND cases (88%) and WNF cases (88%) reported onsets of illness between July and September (Figure 12).

A majority of WNND cases were hospitalized (55%), compared with only 22% of WNF cases. There were 135 (9%) deaths attributed to WNV among reported cases of WNND between 2002 and 2011 (Table 4). No WNV-related deaths were reported among WNF cases.

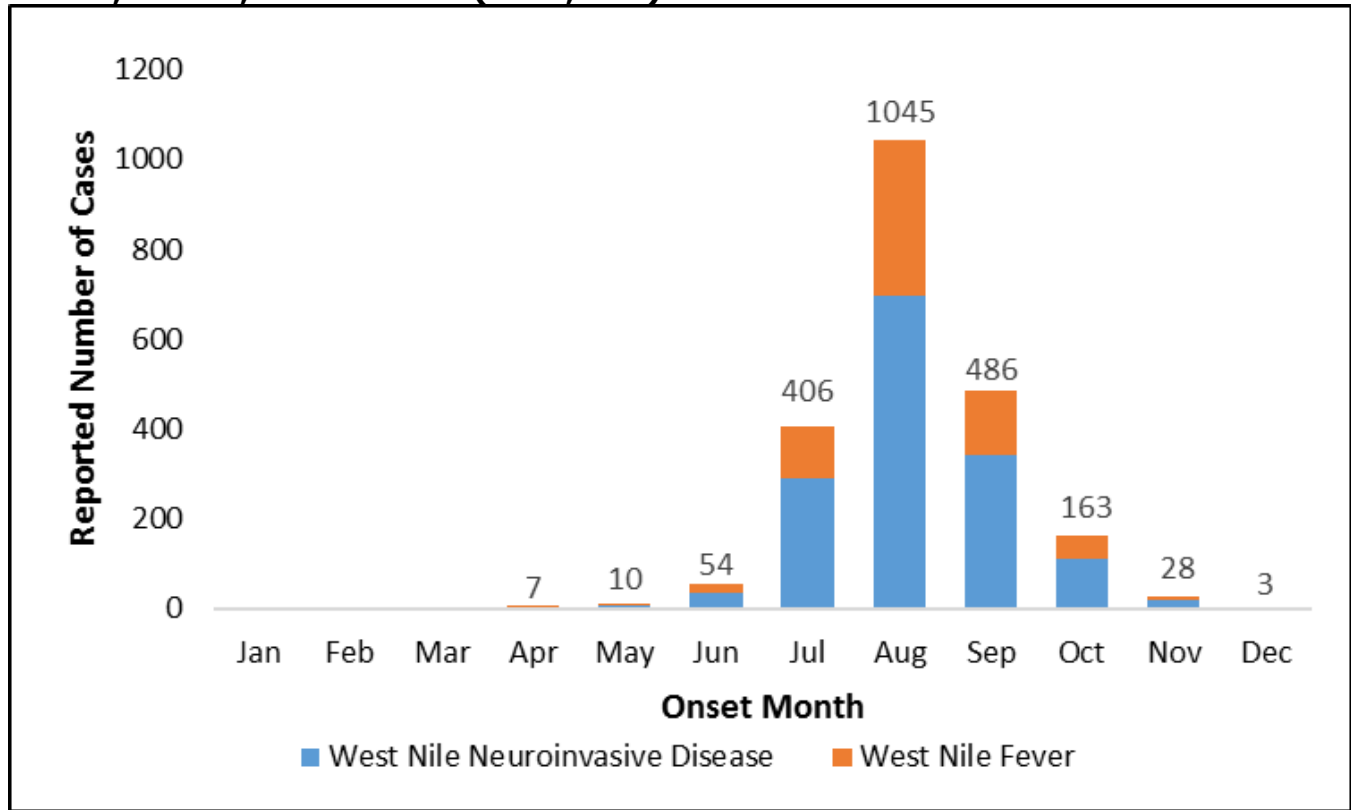
**Table 3. Characteristics of Reported Human WNV Disease Cases, Texas, 2002-2011**

Characteristic	WNND (N=1,513)		WNF (N=689)	
	Number	%*	Number	%*
<b>Gender</b>				
Male	918	61	385	56
Female	593	39	304	44
Unknown	2	0	0	0
<b>Age Group at Onset (years)</b>				
<1-9	19	1	8	1
10-19	55	4	38	6
20-29	93	6	65	9
30-39	153	10	100	15
40-49	242	16	146	21
50-59	255	17	142	21
60-69	268	18	84	12
70-79	288	19	74	11
80+	138	9	32	5
Unknown	2	0	0	0
<b>Race/Ethnicity</b>				
Non-Hispanic White	764	50	451	65
Hispanic	379	25	154	22
Asian/Pacific Islander	6	0	3	0
Black	103	7	33	5
American Indian/Alaska Native	1	0	0	0
Unknown	260	17	48	7
<b>Clinical Syndrome</b>				
Encephalitis/Meningoencephalitis	1,053	70		
Meningitis	460	30		
Uncomplicated Fever			689	100
<b>Clinical Course</b>				
Hospitalized	836	55	152	22
Death	135	9	0	0

WNV-West Nile virus WNF-West Nile fever WNND-West Nile neuroinvasive disease

\*Percentages may not add to 100 due to rounding.

**Figure 12. Reported Human West Nile Disease Cases by Month of Illness Onset, Texas, 2002-2011 (N=2,202)**



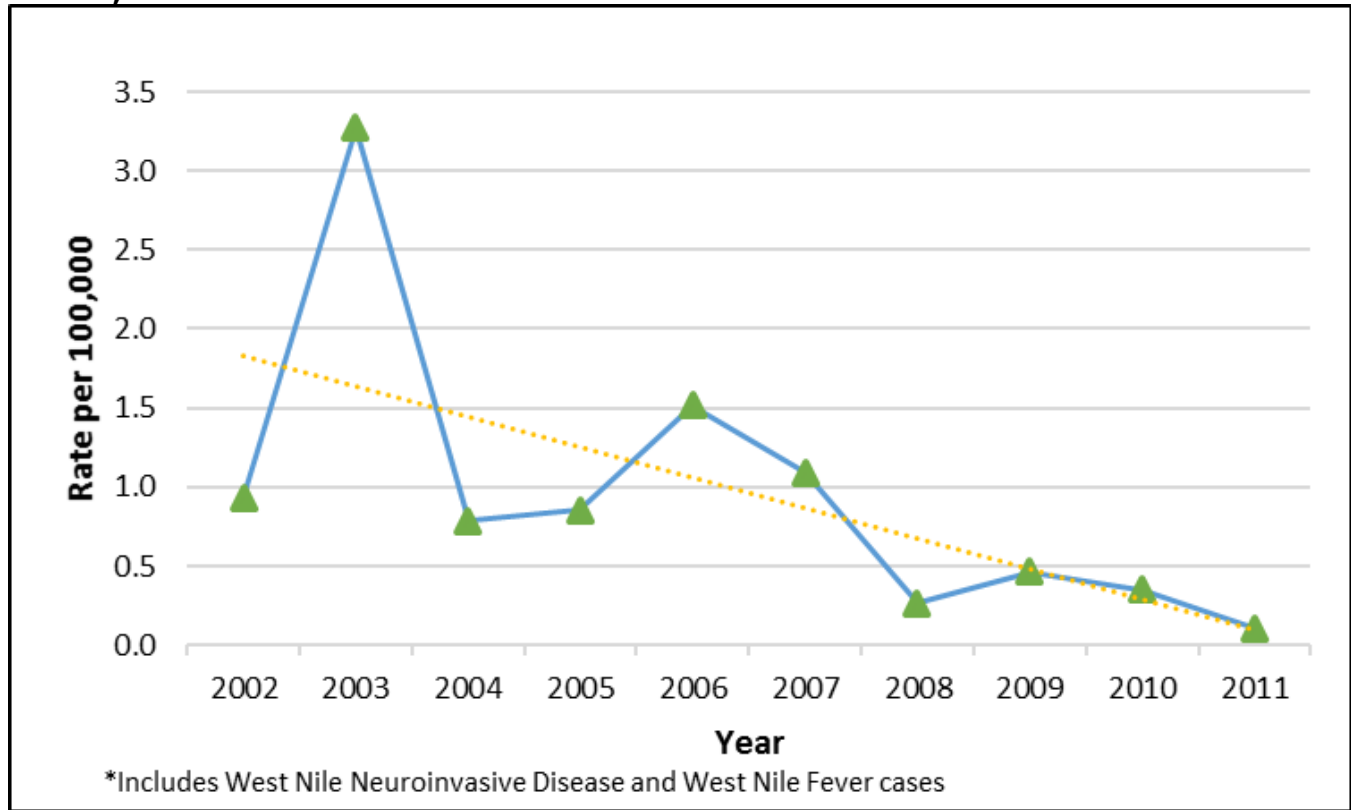
**Table 4. Human WNV Case Counts and Case Fatality Ratios (CFR) by Year, Texas, 2002-2011**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
WNF	*	289	57	67	121	90	24	22	12	7
WNND	202	431	119	128	233	170	40	93	77	20
<b>Total Cases</b>	<b>202</b>	<b>720</b>	<b>176</b>	<b>195</b>	<b>354</b>	<b>260</b>	<b>64</b>	<b>115</b>	<b>89</b>	<b>27</b>
WNV Deaths	13	37	8	11	32	16	1	9	6	2
CFR (%) All Cases	6.4	5.1	4.5	5.6	9.0	6.2	1.6	7.8	6.7	7.4
CFR (%) WNND	6.4	8.6	6.7	8.6	13.7	9.4	2.5	9.7	7.8	10.0

WNV-West Nile virus    WNF-West Nile fever    WNND-West Nile neuroinvasive disease  
 \* WNF cases were not reportable in 2002

Between 2002 and 2011, the statewide incidence rate of WNV disease cases ranged from 0.1 cases per 100,000 population in 2011 to 3.3 cases per 100,000 population in 2003 (Figure 13). Overall, the incidence rates decreased during the timeframe of this report.

**Figure 13. Reported Human West Nile Virus Disease\* Incidence Rates, Texas, 2002-2011**



**Resources:**

CDC La Crosse Encephalitis webpage: <https://www.cdc.gov/lac/>

CDC Chikungunya Virus webpage: <https://www.cdc.gov/chikungunya/>

CDC Dengue webpage: <https://www.cdc.gov/dengue/>

CDC Eastern Equine Encephalitis webpage:  
<https://www.cdc.gov/EasternEquineEncephalitis/>

CDC Saint Louis Encephalitis webpage: <https://www.cdc.gov/sle/>

CDC West Nile Virus webpage: <https://www.cdc.gov/westnile/>

**Acknowledgements and Data Sources:**

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