

WEST NILE VIRUS REPORT: 2012-2017

LONG BEACH EPIDEMIOLOGY/COMMUNICABLE DISEASE PROGRAM



Overview:

West Nile Virus (WNV) is an arbovirus (Appendix 1) most commonly spread to people by infected mosquitoes. Mosquitoes become infected when they feed on infected birds. It was first detected in eastern United States in 1999 and since then cases have been reported in all states of the continental U.S.¹ The virus was first detected in Long Beach among mosquitoes in 2003, and the first human case was reported a year later in 2004.² WNV cases in humans vary each year due to factors such as drought, rain fall, climate change, and bird populations.^{3,4} The majority of cases in Long Beach occur from June to October (Figure 1).

Symptoms:

Most people who become infected with WNV do not develop any symptoms, however, approximately 1 in 5 people who are infected will develop a fever with symptoms such as headache, body aches, joint pains, vomiting, diarrhea, or rash. West Nile Virus has also been found to cause neurologic illness such as encephalitis or meningitis in approximately 1% of people who are infected. The symptoms of neurologic illness can include headache, high fever, stiff neck, disorientation, or paralysis. Symptoms, if any, usually begin 2-14 days after being bite by a mosquito. Anyone living in an area where WNV is present can become infected, however people over the age of 50 have a higher likelihood of becoming sick and are more likely to develop serious symptoms. There is currently no vaccine or medications to treat WNV.^{5,6}

Reporting:

West Nile Virus is a reportable condition. Clinicians and laboratories must report cases of WNV to the Long Beach Department of Health and Human Services (LBDHHS) within one working day.⁷ The data below reflects cases reported to LBDHHS, Epidemiology and Communicable Disease Control Program with onset dates (or specimen collection dates) from 2012 to 2017. The data includes confirmed and probable cases (Appendix 1) based on the Council of State and Territorial Epidemiologists (CSTE) case definitions for neuroinvasive, non-neuroinvasive, and asymptomatic cases (Appendix 1). From 2012-2017 there were a total of 95 confirmed and probable cases reported to the LBDHHS.

2012-2017 WNV Trends (N=95):

- The median age was 61 years old ranging from 18-93 years old (Figure 2)
- 71.6% of cases were male (Figure 3)
- Approximately 44% of cases occurred during the month of September, followed by 26% in October (Figure 1)
- Majority (20%) of cases resided in the 90808 zip code (Table 2 and Figure 6)
- 70.5% of all reported cases were neuroinvasive disease
- 48.4% of cases had a history of either hypertension and/or diabetes (Figure 4,5)
- 82% of cases of cases were hospitalized and 10.5% were fatal (Table 3)

Table 1: West Nile Virus Counts and Rates per 100,000 by Jurisdiction, 2012-2017

Jurisdiction	2012		2013		2014		2015		2016		2017	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Long Beach ⁸	2	0.4	7	1.5	53	11.1	14	2.9	4	0.8	15	3.1
Los Angeles ⁹	172	1.6	165	1.5	218	2.0	300	2.8	153	1.4	255	2.4
California ⁹	527	1.3	433	1.0	892	2.1	860	2.1	483	1.2	525	1.2

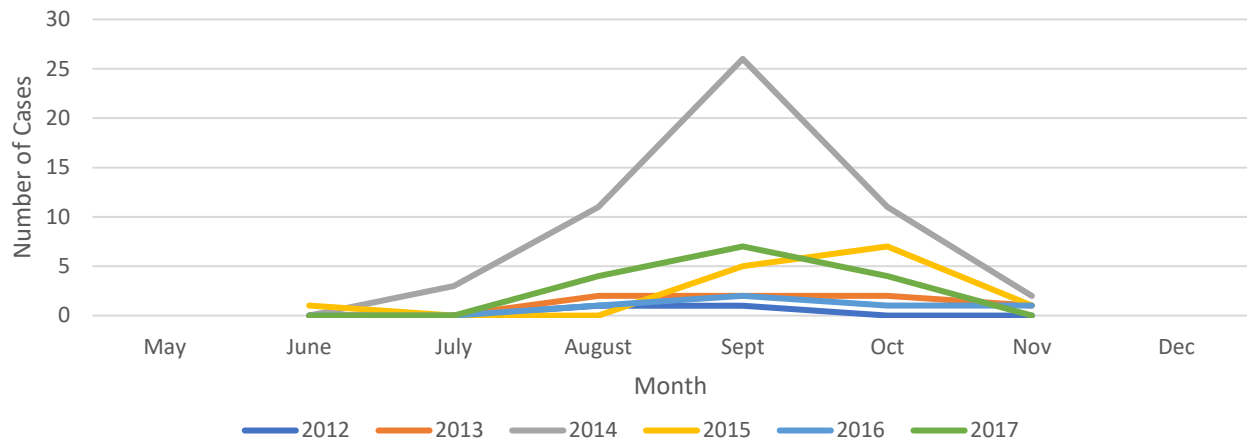
Note: Any indicators with < 20 cases do not meet the requirement for a minimum degree of accuracy outlined by the National Center for Health Statistics. Case counts/rates are included for reporting purposes only.

**Table 2: West Nile Virus by Age Group, Gender, Race/Ethnicity, and Zip Code
Long Beach, 2012-2017**

	2012	2013	2014	2015	2016	2017	Total (N=95)	
	(N=2)	(N=7)	(N=53)	(N=14)	(N=4)	(N=15)	N	%
Age Group								
<18	<5	<5	<5	<5	<5	<5	0	0.0
18-34	<5	<5	<5	<5	<5	<5	6	6.3
35-49	<5	<5	12	<5	<5	<5	15	15.8
50-64	<5	<5	17	5	<5	5	35	36.8
≥ 65	<5	<5	23	5	<5	8	39	41.1
Gender								
Female	<5	<5	19	<5	<5	<5	27	28.4
Male	<5	6	34	11	<5	11	68	71.6
Race/Ethnicity								
Hispanic	<5	<5	9	<5	<5	5	17	17.9
White	<5	<5	29	7	<5	5	49	51.6
Black	<5	<5	<5	<5	<5	<5	0	0.0
Asian	<5	<5	<5	<5	<5	<5	3	3.2
Other	<5	<5	<5	<5	<5	<5	2	2.1
Unknown	<5	<5	13	<5	<5	5	24	25.3
Zip Code								
90802	<5	<5	<5	<5	<5	<5	5	5.3
90803	<5	<5	11	<5	<5	<5	17	17.9
90804	<5	<5	<5	<5	<5	<5	7	7.4
90805	<5	<5	<5	<5	<5	<5	10	10.5
90806	<5	<5	5	<5	<5	<5	6	6.3
90807	<5	<5	<5	<5	<5	<5	5	5.3
90808	<5	<5	11	<5	<5	<5	19	20.0
90810	<5	<5	<5	<5	<5	<5	1	1.1
90813	<5	<5	<5	<5	<5	<5	7	7.4
90814	<5	<5	<5	<5	<5	<5	4	4.2
90815	<5	<5	7	<5	<5	<5	13	13.7

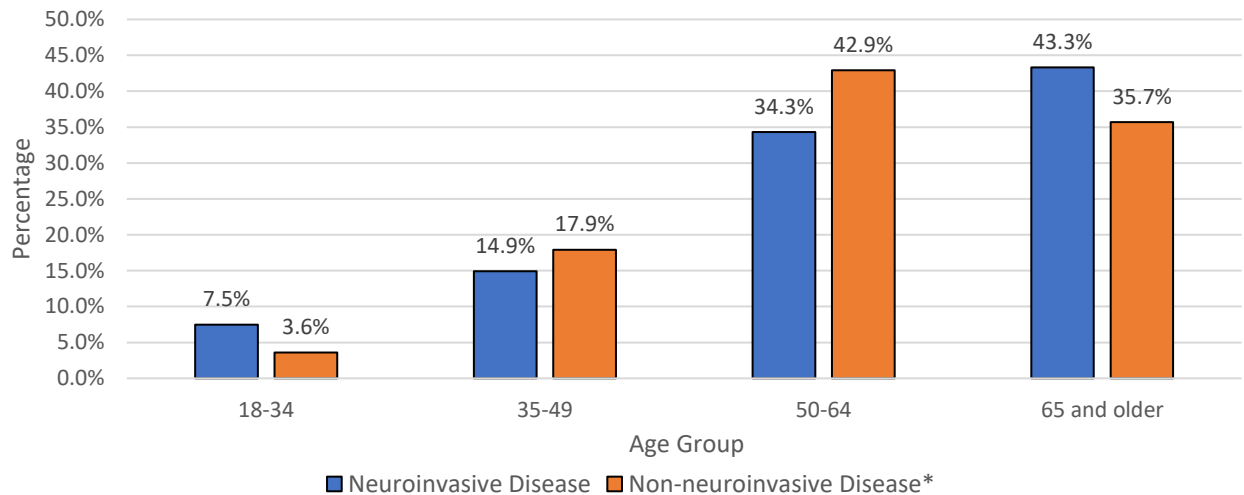
Note: Cells with cases less than five are represented as "<5" for confidentiality purposes

Figure 1: West Nile Virus Cases by Month in Long Beach, 2012-2017



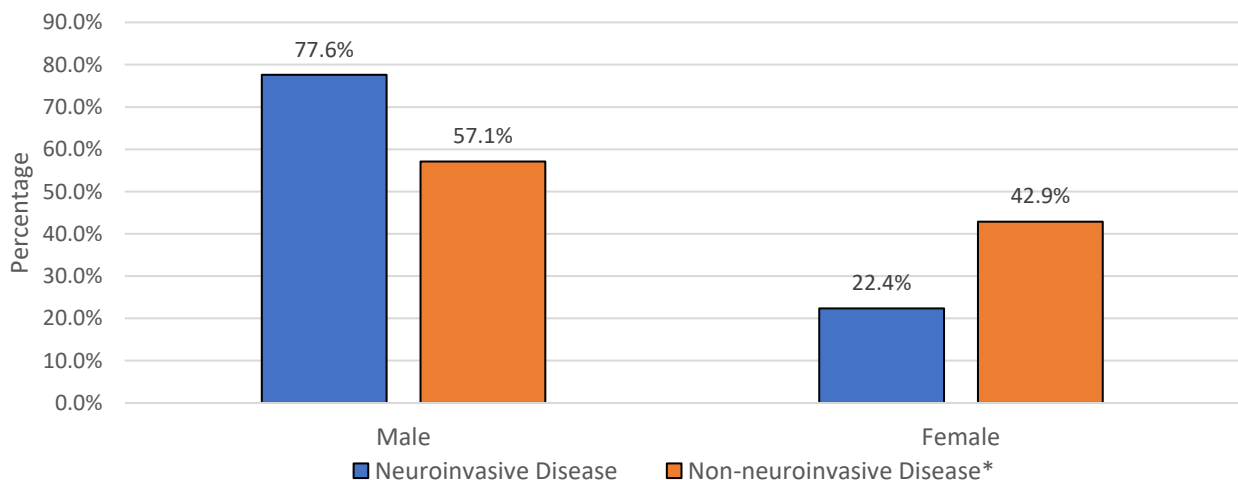
Note: There were no WNV human cases reported between December and May of each year.

Figure 2: WNV Disease Type by Age Group 2012-2017 (N=95)



*Non-neuroinvasive Disease includes: Asymptomatic, WNV Fever, and Unspecified cases

Figure 3: WNV Disease by Gender 2012-2017 (N=95)



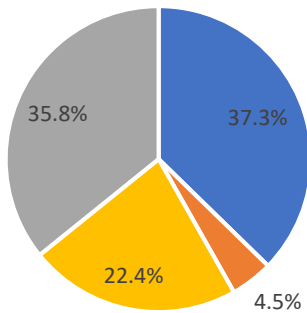
*Non-neuroinvasive Disease includes: Asymptomatic, WNV Fever, and Unspecified cases

Table 3: West Nile Virus Hospitalizations and fatal cases, 2012-2017

	2012	2013	2014	2015	2016	2017
Count	2	7	53	14	4	15
Hospitalizations	1	6	45	9	3	14
Fatal Cases*	0	2	4	0	1	3

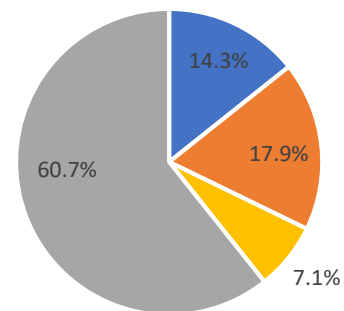
*Fatalities which were reported within 3 months of illness onset

Figure 4: Underlying Health Conditions Among Cases with Neuroinvasive Disease (N=67)



■ Hypertension only ■ Diabetes only
 ■ Hypertension and Diabetes ■ None

Figure 5: Underlying Health Condition Among Cases with Non-Neuroinvasive Disease (N=28)



■ Hypertension only ■ Diabetes only
 ■ Hypertension and Diabetes ■ None

Note: Only hypertension and diabetes were selected for analysis as underlying health conditions in this analysis.

Appendix 1: Definitions

Arbovirus¹⁰:

Any group of viruses that are transmitted by mosquitoes, ticks, or other arthropods

Confirmed Neuroinvasive Disease¹⁰:

A case that meets the clinical criteria for neuroinvasive disease and one or more of the following laboratory criteria for a confirmed case:

- Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, CSF, or other body fluid, OR
- Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, OR
- Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies in the same or a later specimen, OR
- Virus-specific IgM antibodies in CSF, with or without a reported pleocytosis, and a negative result for other IgM antibodies in CSF for arboviruses endemic to the region where exposure occurred.

Probable Neuroinvasive Disease¹⁰:

A case that meets the clinical criteria for neuroinvasive disease and the following laboratory criteria: Virus-specific IgM antibodies in CSF or serum but with no other testing.

Confirmed Non-neuroinvasive Disease¹⁰:

A case that meets the clinical criteria for non-neuroinvasive disease and one or more of the following laboratory criteria for a confirmed case:

- Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, or other body fluid, excluding CSF, OR
- Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, OR
- Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies in the same or a later specimen.

Probable Non-neuroinvasive Disease¹⁰:

A case that meets the clinical criteria for non-neuroinvasive disease and the laboratory criteria for a probable case: Virus-specific IgM antibodies in serum but with no other testing.

Sources

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3. Paz, Shlomit. "Climate Change Impacts on West Nile Virus Transmission in a Global Context." *Philosophical Transactions of the Royal Society B: Biological Sciences* 370, no. 1665 (April 5, 2015). doi:10.1098/rstb.2013.0561.
4. "West Nile Virus Deaths in California Have Nearly Tripled from Last Year." *Daily News*, November 14, 2017. <http://www.dailynews.com/2017/11/13/california-sees-increase-in-west-nile-virus-deaths-this-year-compared-to-2016/>.
5. "West Nile Virus | West Nile Virus | CDC," December 13, 2017. <https://www.cdc.gov/westnile/index.html>.
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8. State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2011-2017, with 2010 Census Benchmark. Sacramento, California, May 2017.
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10. "Arboviral Diseases, Neuroinvasive and Non-Neuroinvasive | 2015 Case Definition." Accessed December 28, 2017. [/nndss/conditions/arboviral-diseases-neuroinvasive-and-non-neuroinvasive/case-definition/2015/](http://nndss/conditions/arboviral-diseases-neuroinvasive-and-non-neuroinvasive/case-definition/2015/).