



## NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Developed by the North Carolina Division of Public Health, Communicable Disease Branch

### La Crosse Encephalitis Surveillance North Carolina, 2012—2018

#### Background

La Crosse encephalitis virus (LACV) is transmitted to humans by the bite of an infected mosquito, first described from a 1960 case in La Crosse, Wisconsin. It is a member of the California serogroup, in the genus *Bunyavirus*, family *Bunyaviridae*.

#### Transmission

LACV is transmitted to humans through the bite of a mosquito (*Aedes triseriatus*, the eastern treehole mosquito). This mosquito is typically infected with LACV after biting a vertebrate reservoir host, especially a small mammal such as a chipmunk or squirrel. *Aedes triseriatus* is an aggressive daytime-biting mosquito, especially in or near deciduous forests. It normally lays its eggs in pools of water accumulated in treeholes, but it will also lay eggs in man-made containers, particularly discarded tires and household items. LACV is passed from the female mosquito to the eggs she lays, and can survive in dormant eggs through the winter. LACV is not thought to be transmitted from human to human, or human to mosquito, because only low levels of virus circulate in human blood.

#### Symptoms

The incubation period (the time from infected mosquito bite to onset of illness) ranges from 5 to 15 days. Many people infected with LACV have no apparent symptoms. Among people who become ill, initial symptoms include fever, headache, nausea, vomiting, and tiredness. Some develop severe neuroinvasive disease (disease that affects the nervous system). Severe LACV disease often involves encephalitis (an inflammation of the brain) and can include seizures, coma, and paralysis. Less than 1% of LAC encephalitis cases are fatal. Severe disease occurs most often in children under the age of 16.

#### Epidemiology

An average of 65 cases of severe (neuroinvasive) LAC disease is reported each year in the United States, and North Carolina alone accounts for approximately one-quarter of those cases each year. In North Carolina, nearly all cases occur in western Appalachian counties, where the *Aedes triseriatus* mosquito is most common.

#### Diagnosis and Treatment

No specific antiviral treatment for LAC encephalitis is available. Patients with suspected LAC encephalitis should be hospitalized, serologic and spinal fluid diagnostic tests ordered (IgM antibody for arboviruses), and supportive treatment (including seizure control) provided.

#### Risk factors

All people who are bitten by mosquitoes in areas where the virus is circulating are at some risk, but residences in western North Carolina counties near wooded areas, or containing numerous small containers, are at elevated risk due to increased exposure to eastern treehole mosquitoes.

#### Prevention

There are no vaccines available for LAC disease. Avoiding bites is the only current means of prevention, such as:

- Using repellents containing DEET, picaridin, IR3535 or oil of lemon eucalyptus;
- Eliminating mosquito breeding sites by emptying standing water from flower pots, buckets, barrels, tires and other containers at least weekly, or by drilling holes so water drains out;
- Wearing long sleeves, pants and socks when weather permits;
- Having secure intact screens on windows and doors to keep mosquitoes out.

## Case Demographics

County Incidence	6 Year Avg (2012-17)			2018		
	No. of Cases	% of total cases	Incidence per 100,000	No. of Cases	% of total cases	Incidence per 100,000
Buncombe	6	35%	2.32	7	29%	2.72
Transylvania	2	11%	5.54	4	17%	11.78
Jackson	2	13%	5.21	4	17%	9.31
Haywood	2	9%	2.51	4	17%	6.55
Swain	<1	5%	5.86	2	8%	13.99
Macon	<1	4%	1.48	1	4%	2.21
Henderson	<1	5%	0.75	1	4%	0.86
Avery	0	0%	0.00	1	4%	5.70
Graham	<1	3%	5.74	0	0%	0.00
Polk	<1	2%	1.64	0	0%	0.00

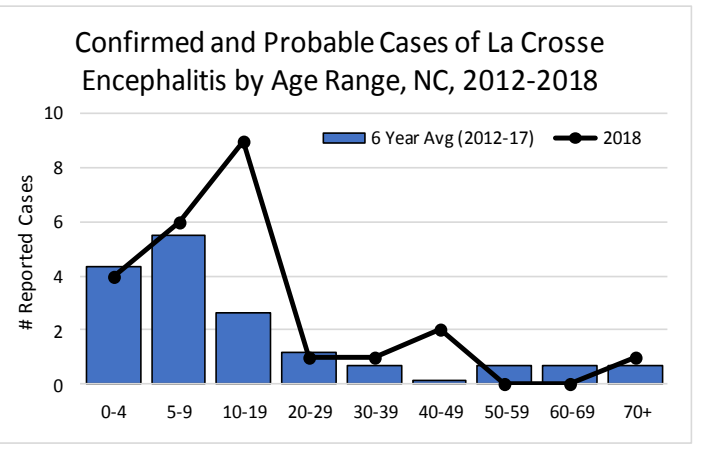
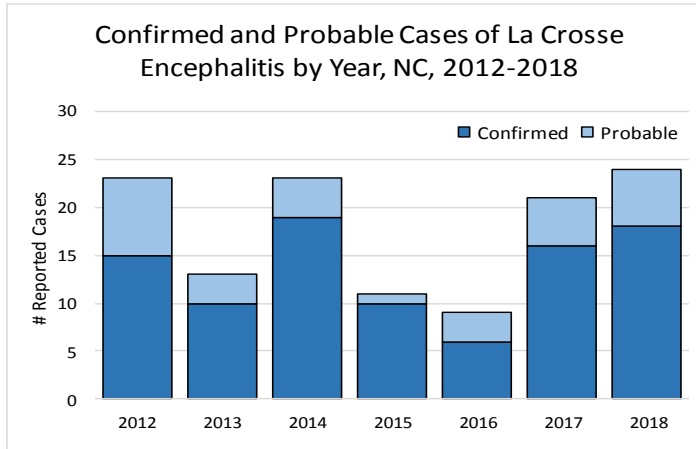
Race	6 Year Avg (2012-17)		2018	
	No. of Cases	% of total cases	No. of Cases	% of total cases
White	14	84%	20	83%
Black or African American	<1	2%	0	0%
Native Hawaiian or Pac. Islander	0	0%	0	0%
Amer. Indian or Alaskan	1.2	7%	3	13%
Asian	<1	1%	0	0%
Other	<1	1%	0	0%
Unknown	<1	5%	1	4%

Sex	5 Year Avg (2012-16)		2017	
	No. of Cases	% of total	No. of Cases	% of total
Male	9	53%	10	42%
Female	8	47%	12	50%
Unknown	<1	3%	2	8%

Hispanic Ethnicity	6 Year Avg (2012-17)		2018	
	No. of Cases	% of total	No. of Cases	% of total
Yes	<1	4%	0	0%
No	11	70%	13	54%
Unknown	4	26%	11	46%

### Cases by Year

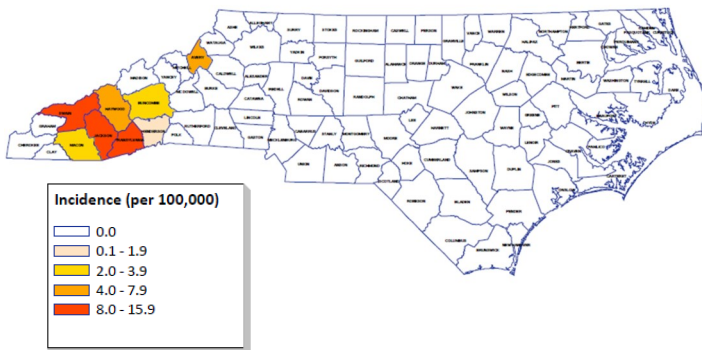
### Cases by Age



### Geographic Distribution

### Cases by Month

Confirmed and Probable Incidence of La Crosse Encephalitis by County of Residence, NC, 2018



Confirmed and Probable La Crosse Encephalitis Cases by Month of Illness Onset, NC

