

Zika Virus Background

Zika virus is an emerging mosquito-borne virus that was first identified in Uganda in 1947 in rhesus monkeys. It was subsequently identified in humans in 1952 in Uganda and the United Republic of Tanzania. Outbreaks of Zika virus disease have been recorded in Africa, the Americas, Asia and the Pacific.

Zika Virus Vectors

Aedes aegypti (primary vector) and *Aedes albopictus* (potential vector).

A. albopictus first collected by Craven County Health Department- circa mid 1980s

A. aegypti last collected by Craven County Health Department - circa early 1990s

Zika Virus vectors



Zika Virus Symptoms

- Common Symptoms
 - Similar to dengue and chikungunya
- Fever, rash, joint pain, conjunctivitis (red eyes), muscle pain and headaches.
 - 1 in 5 people infected become ill.
 - No treatment

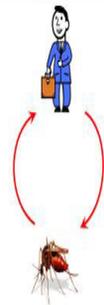
Zika Virus Effects

Virus Effects

- Can be passed to newborn at birth but is rare.
- Microcephaly birth defect
- Reports of Guillain-Barre syndrome

Zika Transmission Cycle

In the United States, people serve as primary vertebrate hosts



Viruses

- Chikungunya
- Dengue
- Yellow fever
- Zika

Vectors

- *Aedes aegypti*
- **Aedes albopictus*

* Unproven vector of yellow fever virus



Zika Transmission Cycle

Zika virus is transmitted to people primarily through the bite of an infected *Aedes aegypti* (*Ae. albopictus*).

The mosquito vectors typically breed in domestic water-holding containers; they are aggressive daytime biters and feed both indoors and outdoors near dwellings.

The spread of the virus through blood transfusion and sexual contact have been reported.

- With on going research

Ae. aegypti and *Ae. albopictus* in the United States

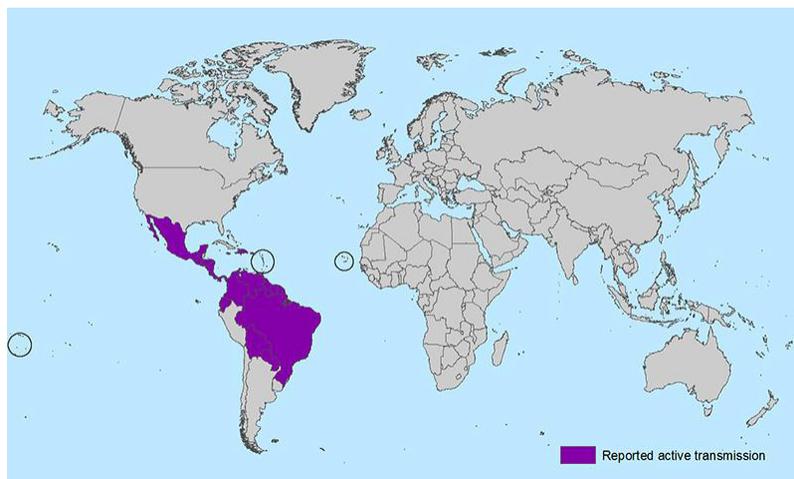
Approximate distribution of *Aedes aegypti* in the United States*



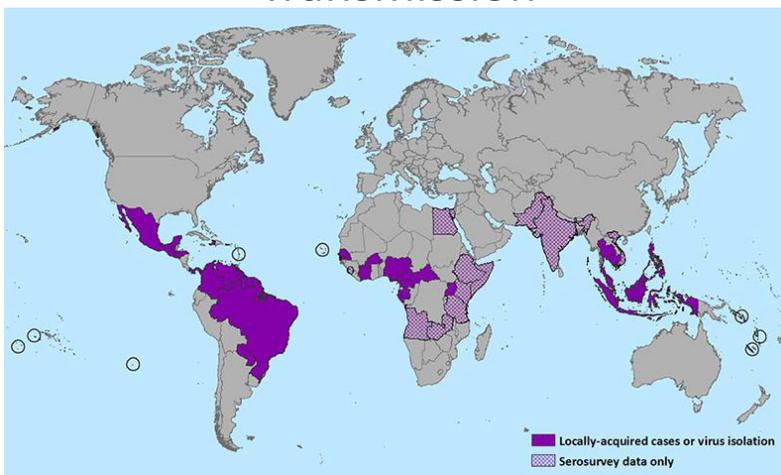
Approximate distribution of *Aedes albopictus* in the United States*



Active Zika Virus Transmission

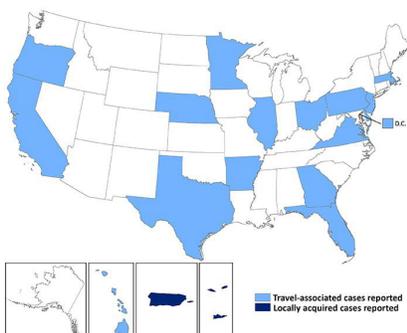


Past and Current Activity of Zika Transmission



Laboratory-confirmed Zika virus disease cases reported to ArboNET by state or territory — United States, 2015–2016

(as of February 10, 2016)



(as of May 5, 2016) – 426 cases – travel assoc. cases

State/Territory	Travel-associated cases (N=51)	Locally acquired cases (N=0)
Alabama	2	0
Arizona	1	0
Arkansas	2	0
California	29	0
Colorado	2	0
Connecticut	1	0
Delaware	3	0
District of Columbia	3	0
Florida	90	0
Georgia	13	0
Hawaii	7	0
Illinois	12	0
Indiana	6	0
Iowa	4	0
Kansas	1	0
Kentucky	5	0
Louisiana	4	0
Maine	2	0
Maryland	11	0
Massachusetts	7	0
Michigan	3	0
Minnesota	14	0
Mississippi	3	0
Missouri	3	0
Montana	1	0
Nebraska	2	0
Nevada	2	0
New Hampshire	3	0
New Jersey	9	0
New Mexico	1	0
New York	77	0
North Carolina	10	0
Ohio	12	0
Oklahoma	4	0
Oregon	6	0
Pennsylvania	16	0
Tennessee	2	0
Texas	30	0
Utah	2	0
Vermont	1	0
Virginia	12	0
Washington	2	0
West Virginia	6	0
Territories (N=1)	(N=0)	
American Samoa		14
Puerto Rico	3	570
US Virgin Islands	1	12

Incubation Periods

- | | |
|--|---|
| <p style="text-align: center;">Eastern Equine Encephalitis</p> <ul style="list-style-type: none"> • It takes 4 to 10 days after the bite of an infected mosquito for mammals to develop symptoms of EEE. Anyone in an area where the virus is circulating can get infected with EEE. The risk is highest for people who live in or visit woodland habitats, and people who work outside or participate in outdoor recreational activities, because of greater exposure to potentially infected mosquitoes. | <p style="text-align: center;">West Nile Virus</p> <ul style="list-style-type: none"> • Most people get infected with West Nile virus by the bite of an infected mosquito. Mosquitoes become infected when they feed on infected birds. Infected mosquitoes can then spread the virus to humans and other animals. The incubation period is usually 2 to 6 days but ranges from 2 to 14 days. |
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Incubation Periods

Dengue Fever Incubation Periods

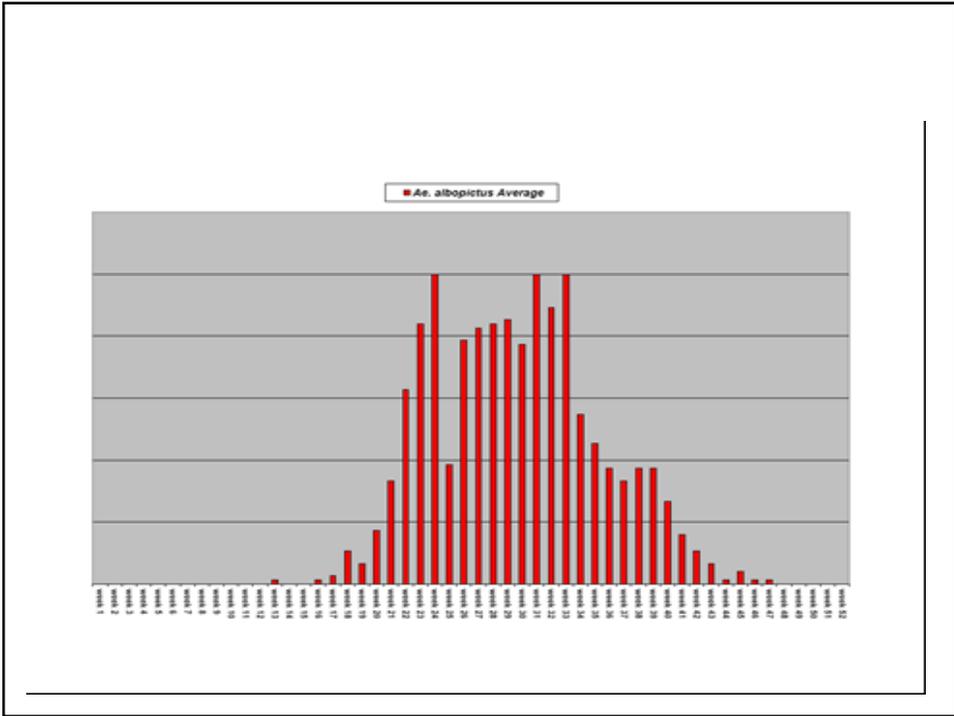
Symptoms of infection usually begin 4 - 7 days after the mosquito bite and typically last 3 - 10 days. In order for transmission to occur the mosquito must feed on a person during a 5- day period when large amounts of virus are in the blood; this period usually begins a little before the person become symptomatic. Some people never have significant symptoms but can still infect mosquitoes. After entering the mosquito in the blood meal, the virus will require an additional 8-12 days incubation before it can then be transmitted to another human. The mosquito remains infected for the remainder of its life, which might be days or a few weeks.

Zika Virus

Mosquitoes acquire the virus from an infected human host. Following an average incubation period of 10 days in the mosquito, the mosquito is then able to transmit the virus to an uninfected host, such as a human. Disease symptoms typically occur after an average incubation period of 2-7 days with a range of 1-12 days in humans after being bitten by an infected mosquito.

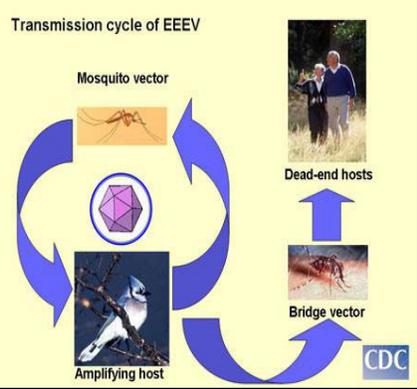
Chikungunya Virus

Mosquitoes acquire the virus from an infected human host. Following an average incubation period of 10 days in the mosquito, the mosquito is then able to transmit the virus to an uninfected host, such as a human. Disease symptoms typically occur after an average incubation period of three to-seven days with a range of 1-12 days in humans after being bitten by an infected mosquito.

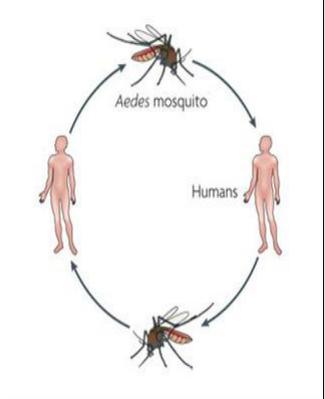


What's the Reservoir?

Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV)



Dengue fever, Zika Virus and Chikungunya virus



Mosquitoes Involved

Primary Amplifying Host

- **Primary Amplifying Host**
- *Cs melanura* (EEE)
- Wild Birds
- *Cx. pipiens* (WNV)
- Wild Birds
- *Oc. triseriatus* (LAC)
- Chipmunks are the reservoir
- Primarily in the western part of the State

Human Host

- *Aedes aegypti*
Humans
- *Aedes albopictus*
Humans

Zika Prevention

GOING TO THE AMERICAN TROPICS?
MOSQUITOES spread **DENGUE, CHIKUNGUNYA, ZIKA,** and other diseases

Mosquitoes bite day and night.
 Prevent mosquito bites:

- Use insect repellent
- Use air conditioning or window/door screens
- Wear long-sleeved shirts and long pants

DON'T LET MOSQUITOES RUIN YOUR TRIP

For more information, visit www.cdc.gov/travel

Pregnant?
 Warning: Zika might be linked to birth defects
 There is no vaccine to prevent Zika virus infection

Protect yourself from mosquito bites

- Daytime is most dangerous**
 Mosquitoes that spread chikungunya, dengue, and Zika are aggressive daytime biters. They can also bite at night.
- Use insect repellent. It works!**
 Look for the following active ingredients:
 • DEET • ICARIDIN • IR3535
- Wear protective clothes**
 Wear long-sleeved shirts and long pants and use insect repellent. For extra protection, treat clothing with permethrin.
- Mosquito-proof your home**
 Use the screens on windows and doors. Use air conditioning when available. Keep mosquitoes from laying eggs in and near standing water.

For more information:
www.cdc.gov/chikungunya • www.cdc.gov/dengue • www.cdc.gov/zika

U.S. Department of Health and Human Services
 Centers for Disease Control and Prevention

Education and Control Strategy

- Water + 7 days = mosquitoes
- Eliminate standing water (tip & toss) every five days
- Fix leaky faucets & outdoor hoses that are dripping water
- Clean gutters so water flows freely
- Repair screens to keep mosquitoes out
- Dispose of old tires
- Apply repellent when outdoors
- Use proper light colored clothing to reduce exposed skin
- Avoid outdoor activities when mosquitoes are most active

Key Points

- Travelers follow precautions to minimize bites
- Pregnant women urged to note CDC travel recommendations
- Transmitted through bite of infected mosquito. Symptoms: rash, red eyes, fever, joint pains & muscle aches
- 1 in 5 show symptoms
- Sexual transmission is possible
- Virus can be passed to unborn babies; microcephaly
- Women talk with doctors before travel
- Refrain from donating or selling blood until symptoms resolved or 28 days after travel to areas w/ ongoing transmission
- Prevent mosquito bites by :
 - Wear insect repellent –use as directed
 - Wear long sleeved shirts and pants. Don't forget socks
 - Use air conditioning or make sure window and door screens are in place
 - Tip and Toss
 - Clean up leaves and debris in yard and in gutters

Discussion?

