



Centers for Disease Control and Prevention



Zika virus epidemiology update

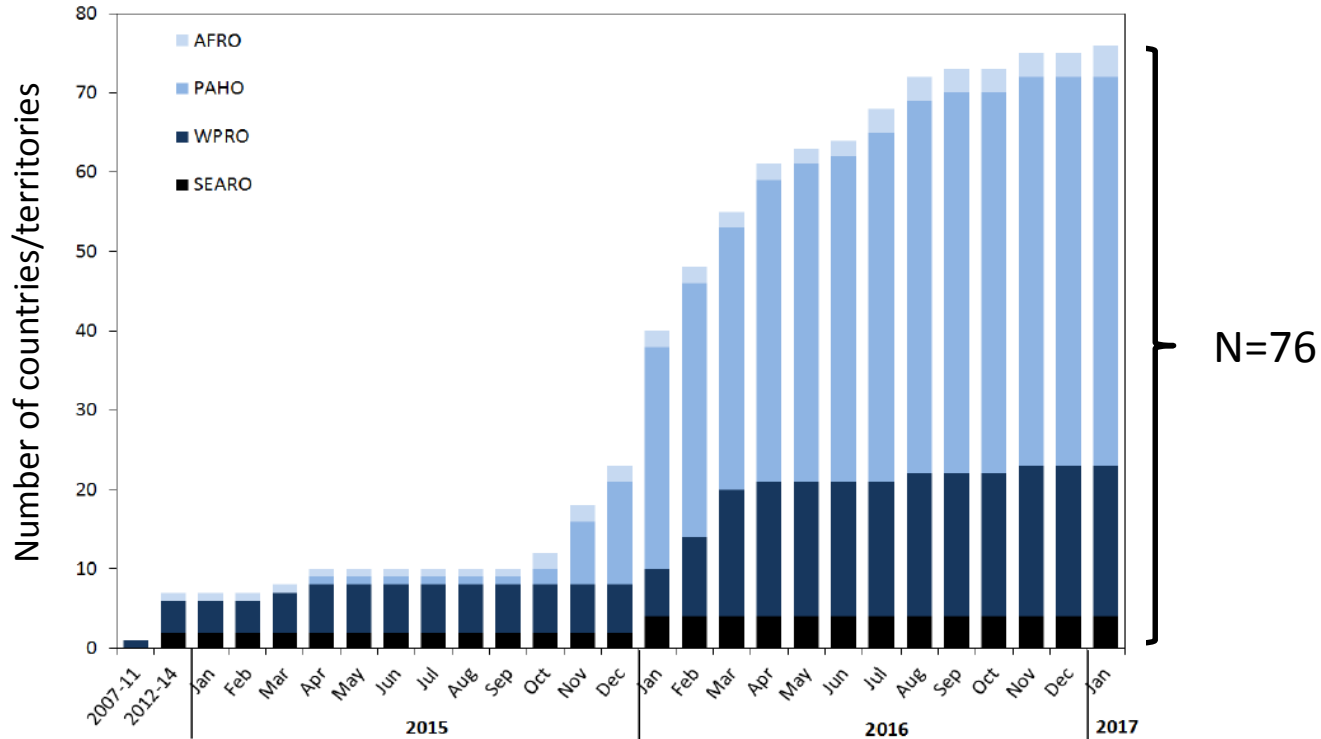
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Zika virus epidemiology

- First isolated from a monkey in Uganda in 1947
- Before 2007, only sporadic human disease cases reported from Africa and southeast Asia
- In 2007, first outbreak reported on Yap Island, Federated States of Micronesia
- From 2013–2015, >30,000 suspected cases reported from French Polynesia and other Pacific islands

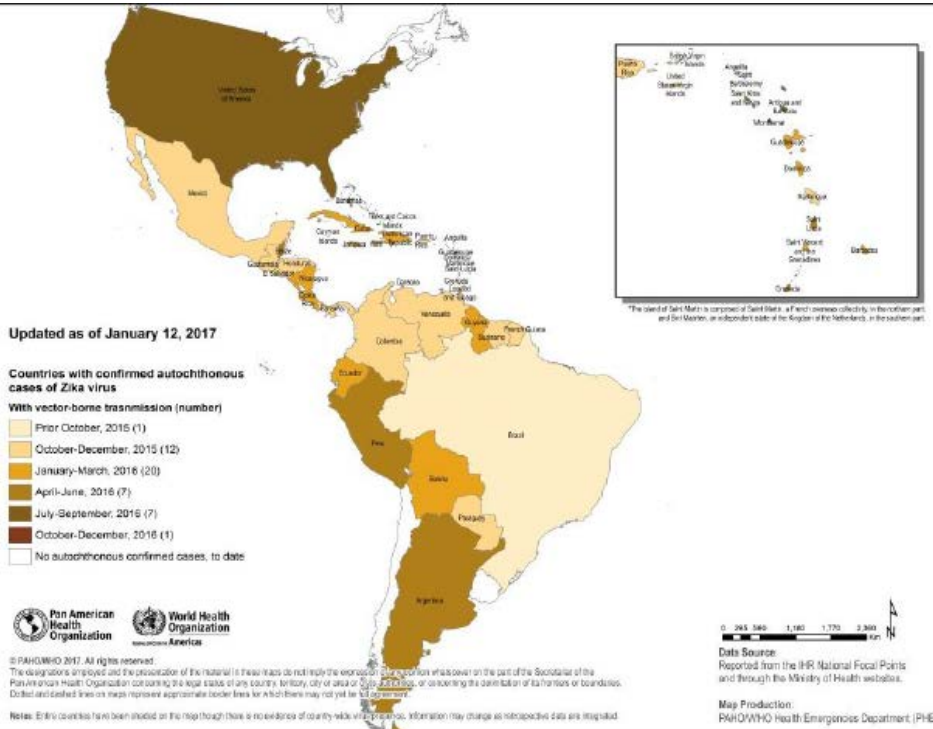
Cumulative number of countries reporting mosquito-borne Zika virus transmission since 2007, by WHO region (as of Jan 18, 2017)



Zika virus in the Americas

- In May 2015, the first locally acquired cases in the Americas were reported in Brazil
- As of January 2017, local transmission reported in 50 countries or territories in the Americas
- Only countries without reported local transmission are Bermuda, Canada, Chile, and Uruguay

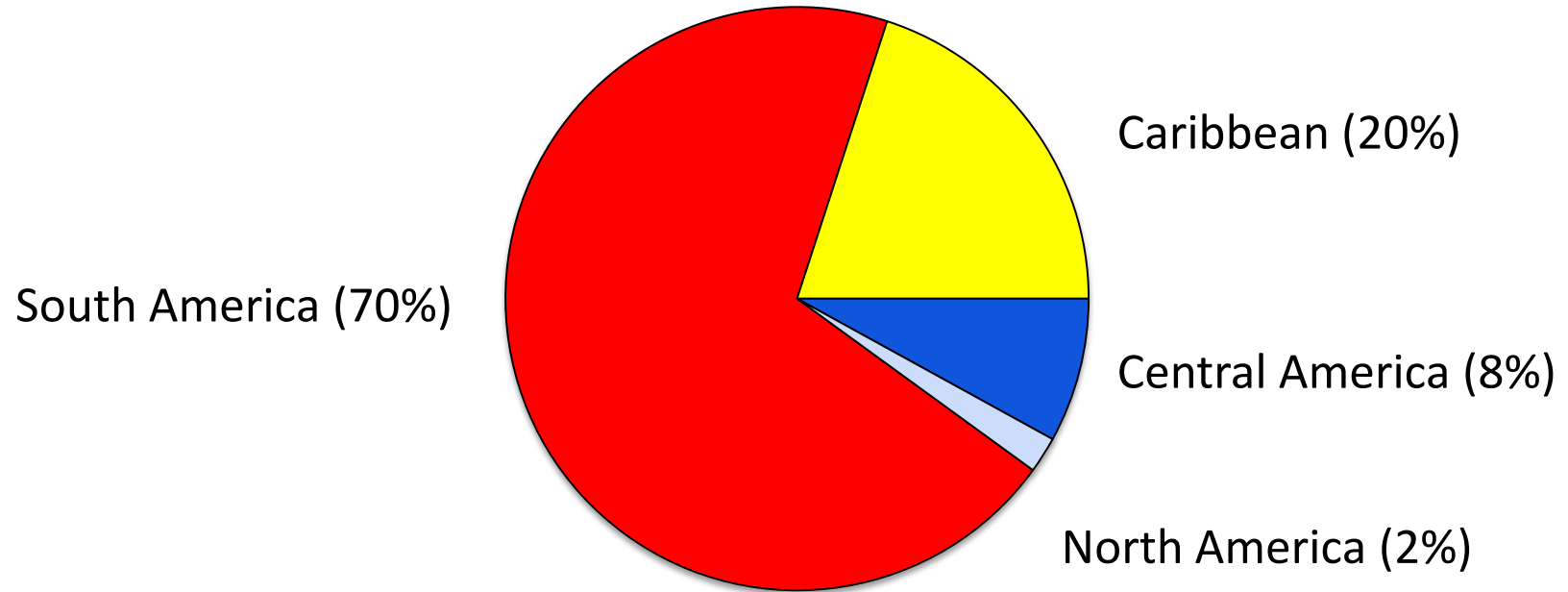
Locally transmitted Zika virus disease cases reported by country/territory in the Americas, 2015–2017 (as of Jan 12, 2017)



Country (N=50)	(N=738,783)*	
Brazil	342,459	(46%)
Colombia	106,697	(14%)
Venezuela	61,825	(8%)
Puerto Rico	37,488	(5%)
Martinique	36,692	(5%)
Honduras	32,234	(4%)
Guadeloupe	31,224	(4%)

***27% of cases are lab-confirmed**

Suspected and confirmed locally transmitted Zika virus disease cases reported in the Americas, 2015–2017 (as of Jan 12, 2017)



N=738,783 suspected and confirmed cases

Zika virus in the United States

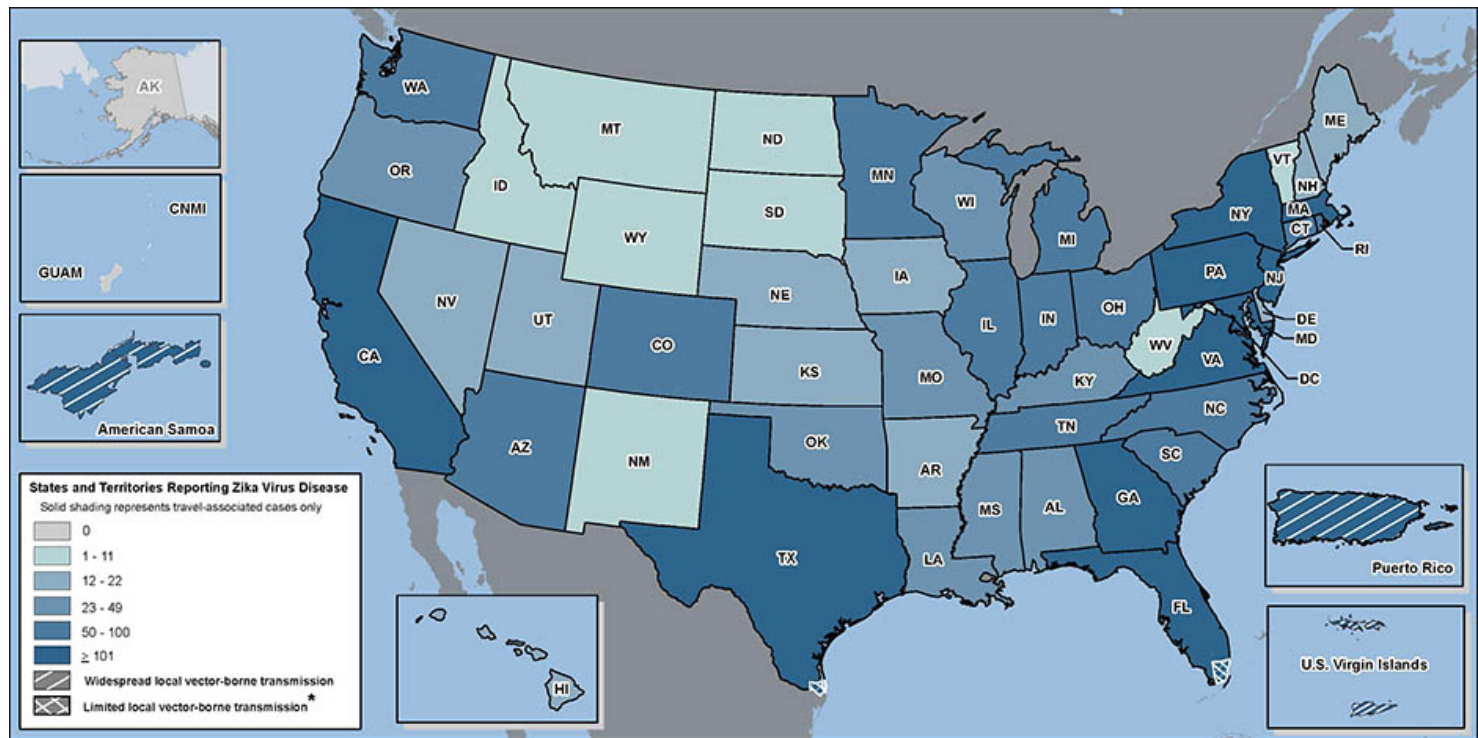
- From 2007–2014, 14 Zika virus disease cases identified in US travelers
- With recent outbreaks in the Americas, cases among US travelers increased substantially
- Limited local mosquito-borne transmission identified in two states (Florida and Texas)
- Outbreaks in three US territories (Puerto Rico, US Virgin Islands, and American Samoa)

Laboratory-confirmed Zika virus disease cases reported to ArboNET by states or territories — United States, 2015–2017 (as of Jan 25, 2017)

	States (N=4,930)		Territories (N=35,784)	
Travel-associated*	4,710	(96%)	140	(<1%)
Locally acquired	219	(4%)	35,644	(99%)
Laboratory acquired	1	(<1%)	0	(0%)

*Includes cases in travelers and their contacts with presumed sexual or in utero transmission, and one case with unknown route of person-to-person transmission.

State or territory of residence for reported Zika virus disease cases — United States, 2015–2017 (as of Jan 25, 2017)



<http://www.cdc.gov/zika/geo/united-states.html>

State of residence for reported Zika virus disease cases — U.S. states, 2015–2017 (as of Jan 25, 2017)

State	Travel associated (N=4,711)	Locally acquired (N=219)
New York	1,001 (21%)	0 (0%)
Florida	840 (18%)	213 (97%)
California	411 (9%)	0 (0%)
Texas	294 (6%)	6 (3%)
New Jersey	174 (4%)	0 (0%)
Pennsylvania	171 (4%)	0 (0%)
Maryland	129 (3%)	0 (0%)

Mosquito-borne Zika virus transmission in Florida

- Beginning in July 2016, sporadic, locally acquired cases identified in multiple counties in South Florida
- Active transmission identified in three small areas of Miami-Dade County
 - Recommendations for pregnant women to avoid travel to those areas and pregnant residents to be tested and followed
 - Intensive public health response, including aerial adulticide and larvicide applications, helped control the outbreaks
 - No evidence of ongoing, sustained local transmission

Likos et al. MMWR 2016;

<http://www.floridahealth.gov/newsroom/2016/10/101116-zika-update.html>

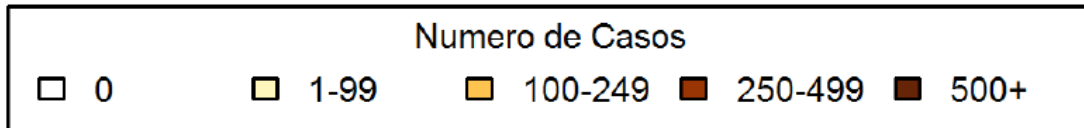
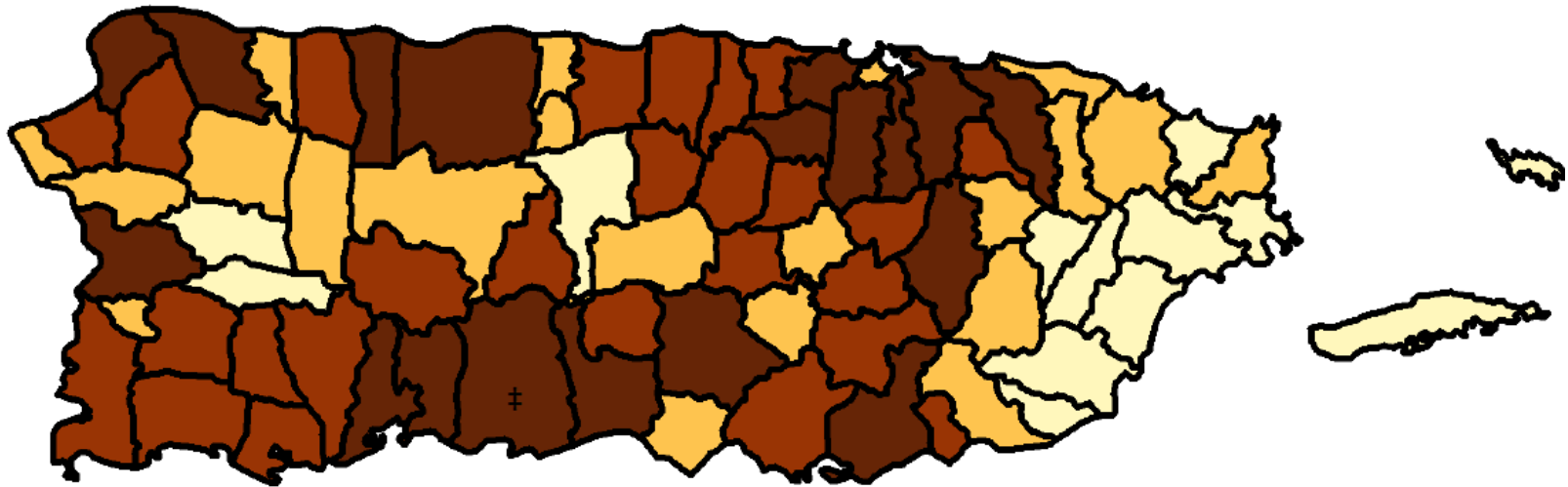
Mosquito-borne Zika virus transmission in Texas

- In November 2016, first case of local mosquito-borne Zika virus infection reported in Brownsville, Texas
- Area borders Mexico with frequent border crossings
- Active Zika virus transmission reported in Mexico near the US-Mexico border
- In December, CDC designated Brownsville a Zika cautionary (yellow) area
 - Recommendations for pregnant women to avoid travel to those areas and pregnant residents to be tested and followed
- As of January 25, six cases of local mosquito-borne transmission reported from the Brownsville area

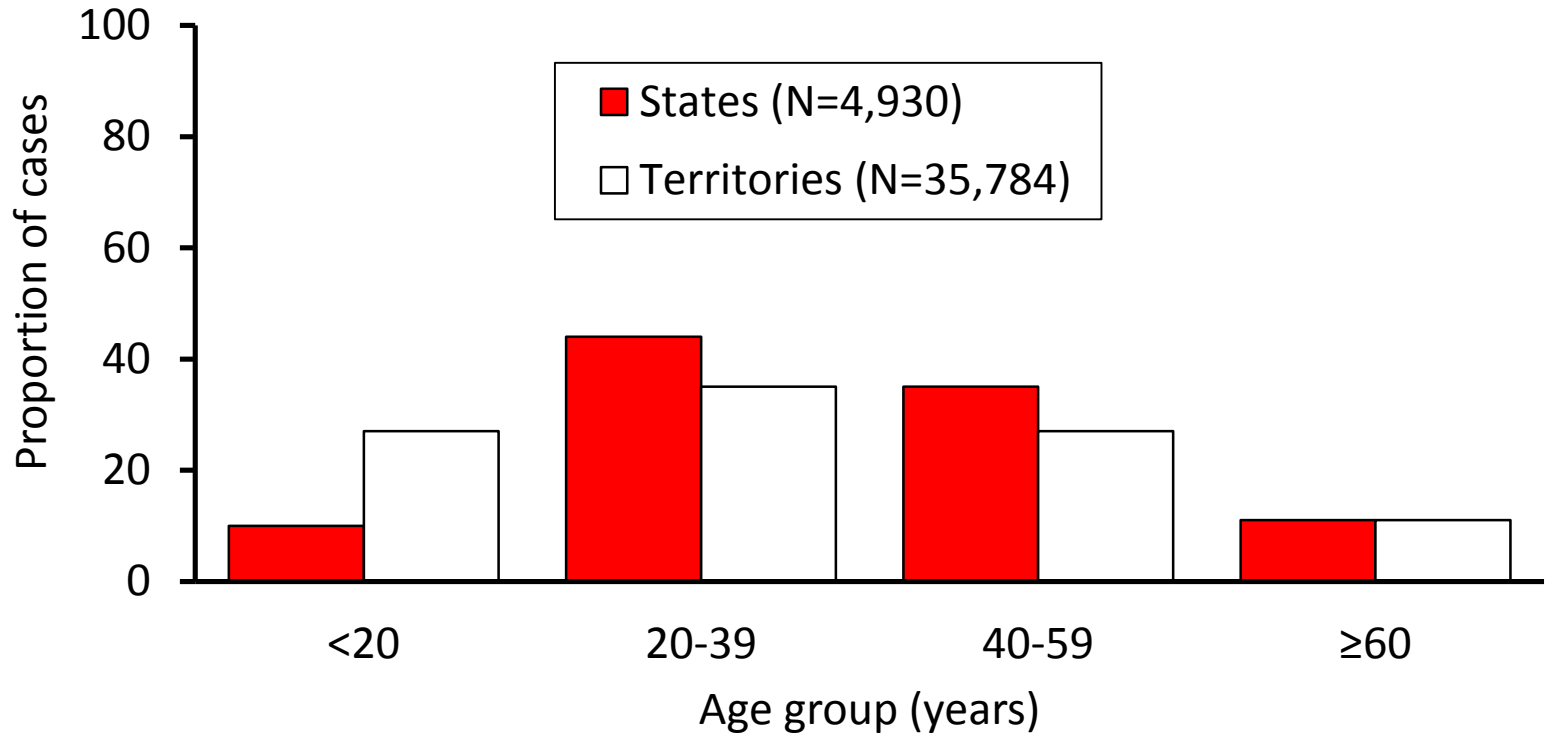
Numbers of reported Zika virus disease cases — U.S. territories, 2015–2017 (as of Jan 25, 2017)

Territory	Travel associated (N=126)	Locally acquired (N=33,712)
Puerto Rico	124 (98%)	32,848 (97%)
US Virgin Islands	2 (2%)	807 (2%)
American Samoa	0 (0%)	57 (1%)

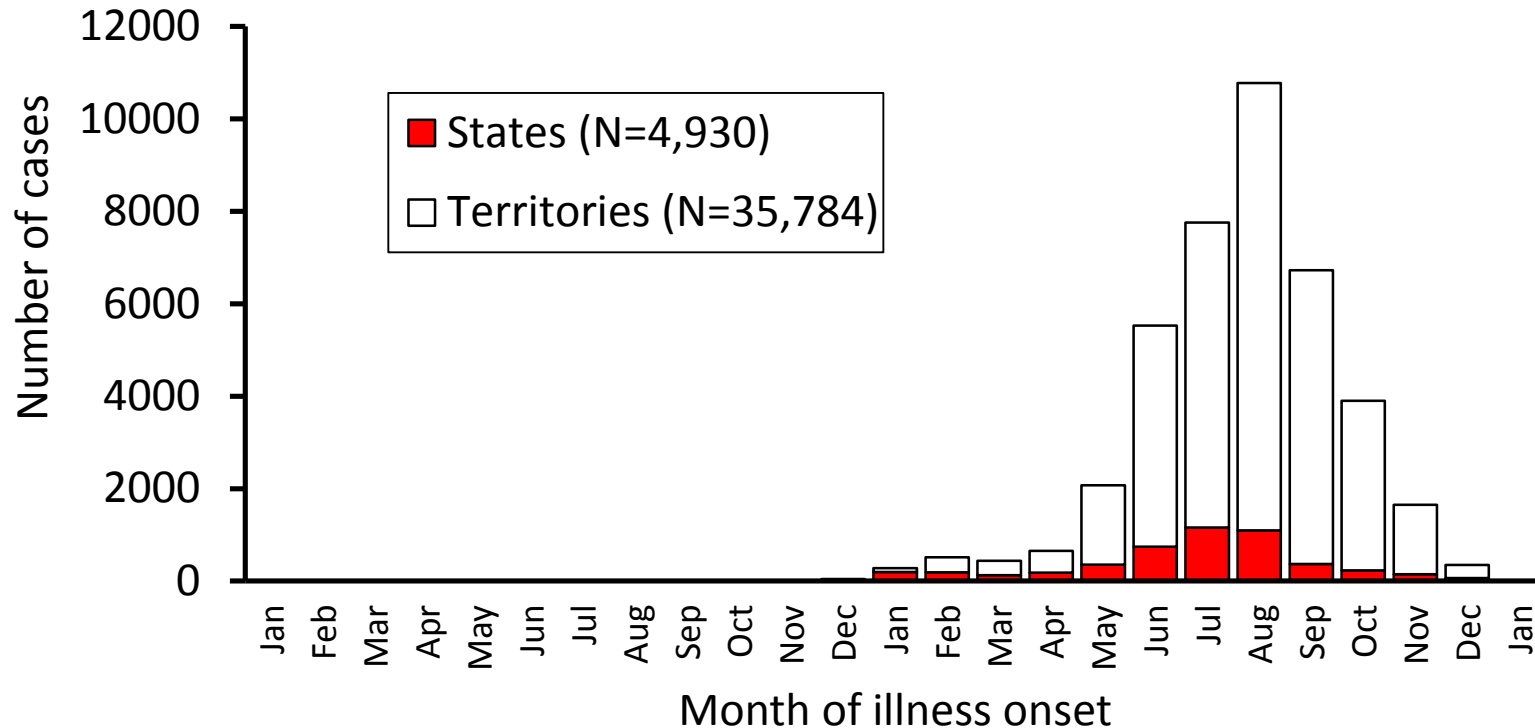
Municipality of residence for reported Zika virus disease cases — Puerto Rico, 2015–2017 (as of Jan 26, 2017)



Age group for reported Zika virus disease cases — US states and territories, 2015–2017 (as of Jan 25, 2017)



Month of illness onset for Zika virus disease cases — US states and territories, 2015–2017 (as of Jan 25, 2017)



Zika virus transmission and clinical manifestations

- RNA flavivirus related to dengue, yellow fever, Japanese encephalitis, and West Nile viruses
- Transmitted to humans primarily by *Aedes* (*Stegomyia*) species mosquitoes
- Typically causes asymptomatic infection or mild dengue-like illness
- Recent outbreaks identified new modes of transmission and clinical manifestations



Aedes aegypti



Aedes albopictus

Zika virus disease clinical course and outcomes

- Most infections asymptomatic
- Clinical illness usually mild
- Characterized by fever, rash, arthralgia, or conjunctivitis
- Symptoms last several days to a week
- Severe disease requiring hospitalization uncommon
- Fatalities rare

Clinical manifestations newly identified in 2015–2016

- Fetal loss
- Microcephaly and other congenital anomalies
- Guillain-Barré syndrome and other neurologic syndromes
- Thrombocytopenia

Meaney-Delman et al. MMWR 2016; Cauchemez et al. Lancet 2016; Rasmussen et al. N Eng J Med 2016; Moore et al. JAMA Pediatr 2016; de Araujo et al. Lancet Infect Dis 2016; Cao-Lormeau et al. Lancet 2016; Sharp et al. Clin Infect Dis 2016.

Non mosquito-borne modes of transmission

- Documented
 - Intrauterine resulting in congenital infection
 - Intrapartum from viremic mother to newborn
 - Sexual
 - Laboratory exposure
 - Blood transfusion
- Possible
 - Organ or tissue transplantation
 - Breast milk
 - Other body fluids

Risk of adverse outcomes of pregnancy

- Incidence and clinical spectrum of congenital Zika virus infection unknown
- Risk of fetal loss and congenital anomalies appear to be greater with infections early in pregnancy
- Estimated 1–13% risk of congenital microcephaly following Zika virus infection during the first trimester of pregnancy

Microcephaly or other CNS malformations possibly associated with Zika virus infection reported to WHO (as of Jan 20, 2017)*

Country/territory (N=29)	(N=2,635)	
Brazil	2,366	(90%)
Colombia	78	(3%)
United States	41	(2%)
Dominican Republic	22	(1%)
Martinique	18	(1%)
French Guiana	16	(1%)
Guatemala	15	(1%)
22 other countries/territories	79	(3%)

*Includes cases acquired in other countries

Clinical findings in infants with congenital Zika virus infection

Brain anomalies

- Subcortical calcifications
- Ventriculomegaly
- Abnormal gyral patterns
- Corpus callosum agenesis
- Cerebellar hypoplasia

Ocular anomalies

- Microphthalmia
- Cataracts
- Chorioretinal atrophy
- Optic nerve hypoplasia

Neurologic sequelae

- Hypertonia/hypotonia
- Irritability
- Tremors
- Swallowing dysfunction
- Hearing loss
- Visual impairment

Congenital contractures

- Clubfoot
- Arthrogryposis

Zika virus perinatal transmission

- Two case reports from French Polynesia
- Both women developed mild rash illness within 3 days of delivery
- One infant developed a transient rash and mild thrombocytopenia at 3 days of life
- Second infant remained asymptomatic
- Both mothers and infants had Zika virus RNA in serum
- Newborns had otherwise unremarkable clinical course

Zika virus sexual transmission

- Identified in sexual partners with discordant travel history
- First report in 2011 in returning traveler from Senegal
- In 2016, sexually transmitted cases reported from 12 countries, including 38 cases in the United States
- Most reported cases result from men with symptomatic illness transmitting to their female or male partner
 - One report of transmission from a woman to a man
 - Two reports of transmission from asymptomatic men

Zika virus in semen and vaginal fluid

- Zika viral RNA detected in semen up to 6 months after illness onset and in vaginal fluid up to 2 weeks after illness onset
- Zika virus cultured from semen up to 70 days after illness onset
- Sexual transmission reported up to 40 days after illness onset in the transmitting partner
- Data from case reports and may not reflect true incidence or risk of transmission

Impact of Zika virus sexual transmission

- Incidence, duration, and risk factors for sexual transmission unknown
- One modeling study from Brazil suggested the apparent increased incidence of disease in women is due to sexual transmission
- Another model determined that sexual transmission is not a significant factor in driving an outbreak
- Two prospective cohort studies in United States ongoing to evaluate frequency and duration of Zika virus RNA and live virus in semen

Transfusion-transmitted Zika virus infections

- Zika virus RNA identified in 42 (3%) of 1,505 blood donors in French Polynesia in 2013–2014; none of the products were transfused
- In 2016, at least 3 cases of transfusion transmitted Zika virus infections have been reported from Brazil
- In February 2016, FDA issued recommendations to reduce the risk of transfusion-transmitted Zika virus in the United States
- From April–December, 2016, routine screening identified Zika virus RNA in 360 (0.6%) of 54,588 blood donations in Puerto Rico
- In August 2016, FDA recommended routine Zika virus screening of all blood donations in the United States

Zika virus laboratory transmission

- From 1964–1980, there were 4–6 reports of probable Zika virus infections due to laboratory exposure
- In 2016, one report of confirmed Zika virus infection following a needle stick injury in US researcher
 - Mild symptomatic illness without complications

Zika virus in breast milk

- Zika virus transmission through breast milk has not been documented
- Zika virus RNA detected in breast milk collected several days after onset of illness in two women with perinatal transmission in French Polynesia
 - Viral culture negative on breast milk
- Zika virus RT-PCR and culture positive on breast milk collected 4 days after onset of illness in a woman in New Caledonia
 - Infant asymptomatic and no laboratory evidence of infection
- Benefits of breastfeeding outweigh theoretical risk of transmission

Zika virus transmission from other body fluids

- Zika virus RNA has been detected in saliva and tears
- One case of possible person-to-person transmission reported from Utah
- Index patient developed fatal septic shock and had a level of viremia approximately 100,000 times higher than average
- Zika virus infection diagnosed in a family member who had close contact (i.e., kissing and touching) with the index case in days prior to death
- No specific source or mode of transmission was identified
- No additional infections identified in 18 other family members or healthcare workers who cared for the patient

Guillain-Barré syndrome following Zika virus infection

- First described in French Polynesia during 2013–2014 outbreak
- Additional 19 countries have now reported at least one Guillain-Barré syndrome case with laboratory evidence of Zika virus infection
- 13 GBS cases reported from US states and 50 from Puerto Rico
- Estimated 1.6 cases of Guillain-Barré syndrome per 10,000 Zika virus infections (95% CI 1.1–2.6 per 10,000)
- Outcomes and increased risk in older adults appear similar to Guillain-Barré syndrome due to other causes

Neurologic disease with non-congenital Zika virus infections

- Rare reports of encephalopathy, meningoencephalitis, myelitis, and uveitis
- Reports of peripheral paresthesias, with or without Guillain-Barré syndrome

Roze et al. Eurosurv 2016; Carteaux et al. N Eng J Med 2016; Mecharles et al. Lancet 2016; Fortado et al. N Eng J Med 2016

Risk of thrombocytopenia and hemorrhage

- Estimated 1% of symptomatic Zika virus disease cases may have thrombocytopenia (platelet count <100,000)
- Rare reports of severe thrombocytopenia with hemorrhage or septic shock, including at least two fatal cases

Zika virus treatment and prevention

- Reduce mosquito exposure through vector control and personal protective measures (e.g., insect repellent and air conditioning)
- Pregnant women should not travel to areas with local transmission and take steps to protect against possible sexual transmission
- No vaccine or medication to prevent or treat infection or disease
 - Numerous candidate vaccines being evaluated
 - Coordinated US government effort to facilitate development
 - Targeted use will depend on ongoing incidence of disease and complications, and vaccine characteristics (e.g., safety, efficacy, and duration of protection)

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

