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## CFR Backgrounders

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### The Zika Virus

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Author: [Danielle Renwick](#), Copy Editor/Writer

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#### Introduction

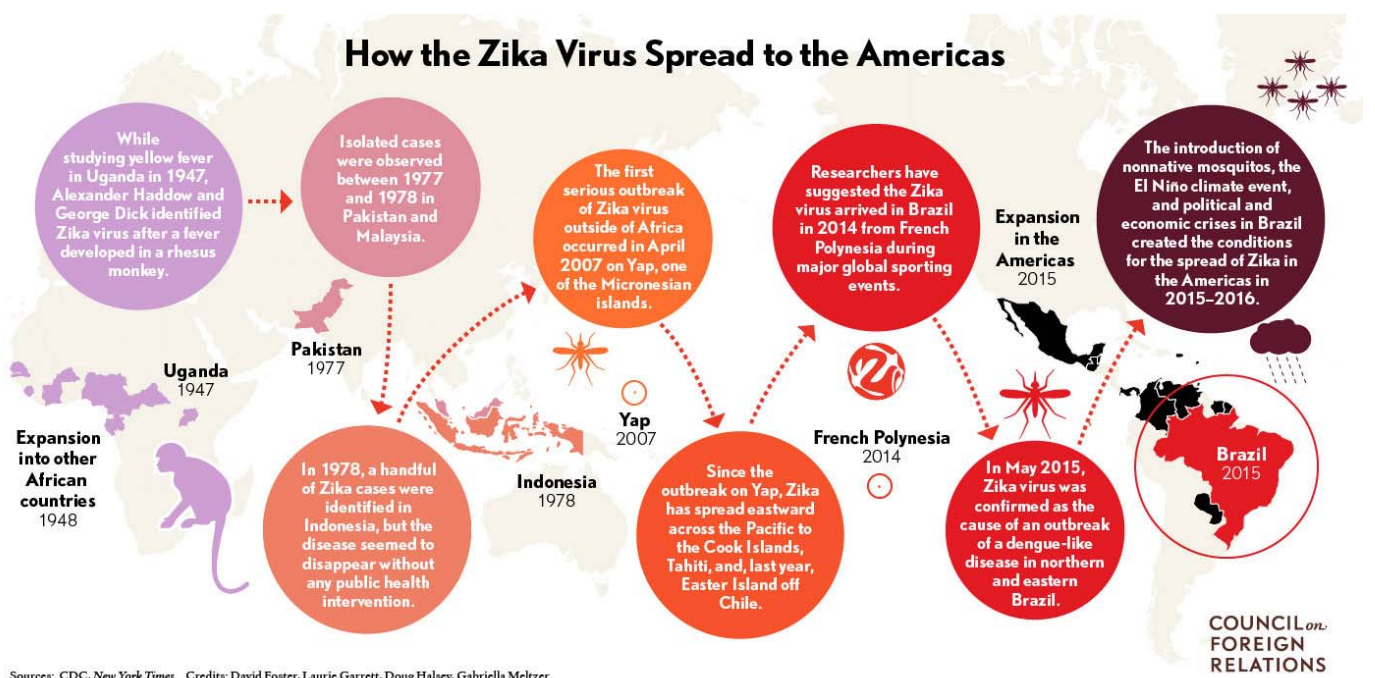
The Zika virus, a mosquito-borne illness, has been linked to a dramatic rise in birth defects in Brazil and was reported to be spreading across the Americas in early 2016, prompting the [World Health Organization](#) (WHO) to declare a Public Health Emergency of International Concern. By February 2016, mosquitoes carrying the virus had been detected in more than two dozen countries, and the WHO projected that as many as four million people could be infected by the end of the year. Health officials say there are strong indications that the Zika virus is behind the twentyfold increase in cases of microcephaly, a condition in which infants are born with unusually small heads and brains that usually results in developmental disabilities. The U.S. Centers for Disease Control and Prevention (CDC) has said pregnant women, or women who may become pregnant, should [consider postponing travel](#) to the nearly thirty countries where the Zika virus has been transmitted. Some governments, including those of [Colombia](#), [Ecuador](#), and El Salvador have advised women against becoming pregnant in the near future.

#### What is the Zika virus?

The Zika virus is a mosquito-borne illness carried by *Aedes aegypti* mosquitoes. Most people who are infected do not become ill, but an estimated 20 percent experience symptoms [including](#) rash, fever, joint pain, red eyes, muscle pain, and headaches. The incubation period—the time between exposure to exhibiting symptoms—is unknown, but, according to the CDC, it is likely between a few days and a week. In most cases symptoms are mild and last up to a week.

The virus was first discovered in 1947 in the Zika forest in central Uganda, but [until 2007](#), there had only been fourteen documented cases in humans. Experts say the disease likely [did not spread](#) among humans in Uganda because the *Aedes africanus* mosquitoes that transmit the virus there are poorly adapted to human environments, and therefore preferred to prey on monkeys. Researchers found evidence of infections [elsewhere in Africa, as well as in Asia](#), but local populations there appear to have developed resistance to the virus, preventing large-scale outbreaks.

In 2007 officials confirmed forty-nine cases of Zika on the island of Yap, in the Federated States of Micronesia, in the western Pacific. In a 2013–2014 outbreak, nearly four hundred cases were confirmed in French Polynesia, more than five thousand miles southeast of Yap. Researchers say the virus likely arrived in Brazil in 2014, either during the World Cup or a canoe race that brought teams from several Polynesian islands to Rio de Janeiro.



While in most cases symptoms of Zika infection are mild, researchers fear the virus may be responsible for a dramatic rise in birth defects. A link, however, has not been proven.

Brazilian health officials have reported more than four thousand cases of suspected microcephaly since the beginning of 2015, up from [147 cases the year before](#). But some experts warn that cases of microcephaly have been [overreported](#): As of February 2016, researchers confirmed 404 cases but ruled out 709 suspected cases; thousands more remain under investigation. Colombian officials said there was [no evidence](#) that Zika had caused any cases of microcephaly though more than three thousand pregnant women have been diagnosed with the virus in the country.

*Rapid urbanization and increases in international travel expose more people to more diseases, and changing weather patterns expand the range of mosquitoes.*

Zika has also been associated with Guillain-Barre syndrome (GBS), a rare disorder in which the immune system attacks the nerves, sometimes causing paralysis. Symptoms can last a few weeks, and though most people recover, there have been reports of patients suffering permanent harm, or even death when paralysis reaches the lungs and respirators are not available.

### How is it transmitted?

Zika is primarily spread by *Aedes* mosquitoes. *Aedes aegypti* has spread most of the cases in the Americas. Its reach in the United States is generally limited to Florida and Hawaii. Scientists believe the *Aedes albopictus*, also known as the Asian tiger mosquito, may also be able to transmit the virus; it has a much wider range in the United States, reaching as far north as New York and Chicago in the summer.

There have been isolated reports of the virus's sexual transmission, and researchers say it could also be transmitted through blood transfusion. The virus has also been found in [saliva and urine](#), but it is unclear whether it can be spread through those channels.

### Why is it spreading so quickly?

The Western Hemisphere is "immunologically naïve" to the Zika virus, meaning that populations in the Americas have not developed resistance to it because the mosquitoes that carry it are not native to the region. (*Aedes aegypti* is believed to have arrived on slave ships in the 1600s, and *Aedes albopictus* in recycled tires shipped from Asia in the 1980s.) The prevalence of the *Aedes aegypti*, the most successful vector for Zika, in dense, urban areas in the Americas also contributes to the spread of the virus. Rapid urbanization and increases in international travel expose more people to more diseases, and changing weather patterns expand the range of mosquitoes.

Extreme weather patterns associated with El Niño—heavy rains in some areas and drought in others—can cause an abundance of standing water, which attracts mosquitoes. (During droughts, people often gather water in open containers.)

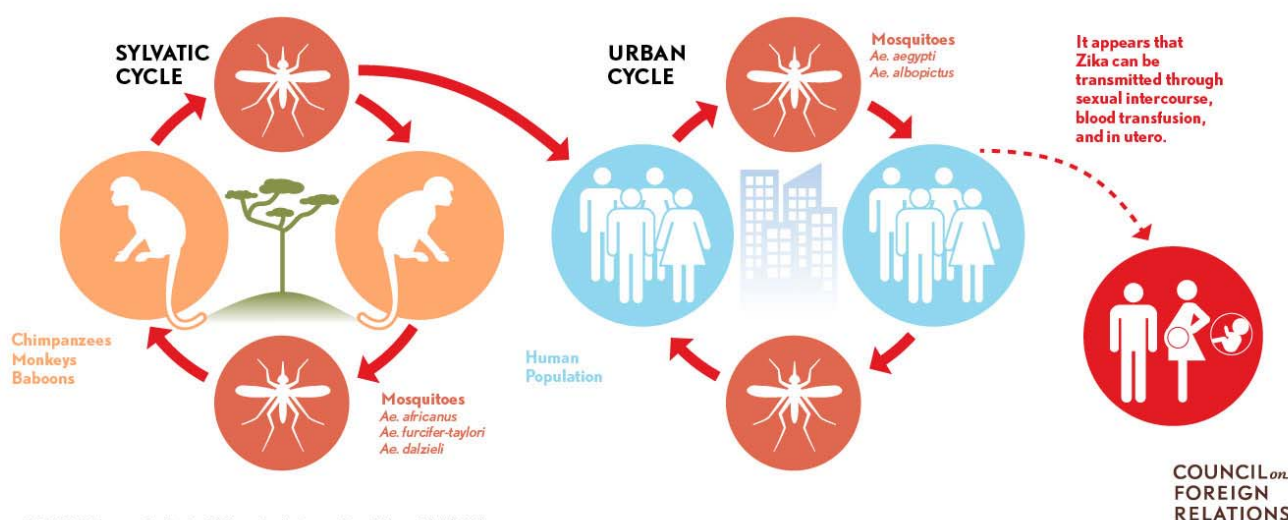
The Zika outbreak comes as other mosquito-borne illnesses are on the rise: Brazil reported 1.6 million cases of dengue fever in 2015, up from 569,000 the year before. Chikungunya, a virus that causes fevers and joint pains, first detected in the Western Hemisphere in 2013, had by July 2015 infected 1.5 million people in the Americas. Zika and other mosquito-borne illnesses appear to **disproportionately affect the urban poor**, who are more likely to live in areas with poor sanitation and open water sources, and less likely to have window screens and air conditioning, leaving them exposed to mosquitoes.

*The Zika outbreak in the Americas comes as the WHO, whose response to the 2014 Ebola outbreak in West Africa was widely criticized, works to improve its emergency response systems.*

Many observers say climate change, increased travel, and urbanization allow the conveyers of such diseases to thrive. "*Aedes aegypti*, the mosquito that is largely responsible for transmitting pathogens such as Zika and dengue, thrives in the warm, humid, increasingly dense urban centers of Latin America, and climate change has been making these places warmer and wetter," writes the *New Yorker's* Carolyn Korman.

## How the Zika Virus Enters the Human Population

The virus originates with nonhuman primates in tropical rainforests but can infect humans. Warm, urban environments with standing pools of water attract mosquitoes, and can lead to the virus's spread.



Sources: CDC, PLOS, Reuters Credits: David Foster, Laurie Garrett, Doug Halsey, Gabriella Meltzer

### Is there a vaccine for Zika?

No, nor is there a cure for microcephaly or Guillain-Barre, which have been linked to the virus. Speech and occupational therapies can improve cognitive development in children with microcephaly, and plasma exchanges and immunoglobulin therapy can **reduce the severity** of Guillain-Barre. The WHO has called for researchers to develop a vaccine and introduce rapid diagnostic testing for the virus. Currently, blood and tissue samples must be sent to advanced laboratories.

Drug companies, including the U.S. biotech firm NewLink Genetics, have **begun early-stage research** to develop a vaccine but warn it could be years away. French pharmaceutical company Sanofi said it would draw on its research on the dengue virus, which is in the same family as Zika, to develop a vaccine.

Governments and health professionals in many countries in the Americas are urging women who are at risk of contracting the virus to avoid becoming pregnant in the immediate future, something that has revived debate over women's reproductive rights and access to contraception in the region. (Abortion is illegal in most cases in most Latin American countries.) The CDC recommends Zika testing and possible amniocentesis for pregnant women returning from affected countries with symptoms.

### What is the threat to the United States?

According to CDC officials, widespread transmission of Zika in the mainland United States is "**unlikely**." Researchers point to other mosquito-borne illnesses, such as dengue and Chikungunya, which have not gained traction in the mainland United States, and say the prevalence of air conditioning and window screens in the United States helps to **stem the transmission**. High-quality **sanitation systems**, which reduce exposure to standing water, also reduce the risk of transmission.

By early February 2016, U.S. officials had identified [dozens of cases](#) of Zika in travelers who had returned from Latin America. One person who had contracted the virus in Venezuela is believed to have transmitted it sexually to a person in Texas. At least nineteen cases of local transmission have been reported in the U.S. territory of Puerto Rico.

Health experts say they expect Zika to come to the United States as temperatures rise in the spring. A January *Lancet* [study](#) found that around two hundred million people live in areas in the United States that could be affected by Zika in warmer months. CFR Senior Fellow Laurie Garrett warns that Zika could become a [permanent fixture](#) in the Western Hemisphere, like the West Nile virus, especially if it takes hold in [Culex mosquitoes](#), which are ubiquitous in the Americas (Brazilian researchers were able to infect a *Culex* with Zika in a laboratory).

### How are health authorities responding to the outbreak?

The WHO [declared the possible](#) link between Zika and neurological disorders a Public Health Emergency of International Concern on February 1, 2016. The designation allows the agency to raise funds, coordinate multicountry efforts, and require countries to share health data relevant to the outbreak with international authorities. The organization called for more research on the virus (including confirming whether there is a link between Zika and microcephaly), but did not recommend restrictions on travel to Brazil or other areas with Zika virus transmission. The organization also said pregnant women and women of childbearing age [should have access](#) to "necessary information and materials to reduce risk of exposure."

Health officials in Brazil, the epicenter of the outbreak, issued a warning to pregnant women about the possible links between Zika and microcephaly in [November 2015](#), and in February announced plans to deploy 220,000 troops to distribute information on Zika. El Salvador's government has warned women not to become pregnant until 2018, and Brazil, Colombia, and Ecuador have advised women to put off becoming pregnant until more is understood about the virus.

Authorities in the region are trying to control the outbreak by fumigating areas with high incidences of infection, removing pools of standing water, and releasing [genetically engineered mosquitoes](#) whose offsprings' short life spans cause overall population decreases.

U.S. President Barack Obama asked Congress for \$1.8 billion in emergency funding to combat the virus through mosquito control, vaccine research, and education and health care for low-income pregnant women in the United States. Zika infections have also been reported in [New Zealand](#) and [Western European](#) countries, including in a pregnant Spanish woman who had travelled to Colombia.

Nearly half a million people are expected to travel to Brazil in August, when Rio de Janeiro hosts the Summer Olympics. Officials say the risk of transmission will decrease during the Southern Hemisphere's winter months, but some health experts have [called for the games to be cancelled](#). The U.S. Olympic Committee reportedly told sports federations that athletes and staff [should not go to Rio](#) if they feared for their health because of the Zika virus.

The Zika outbreak in the Americas comes as the WHO, whose response to the 2014 Ebola outbreak in West Africa was widely criticized, works to improve its emergency response systems. "WHO has to prove that [it can take charge](#) of dealing with Zika," writes Suerie Moon, a professor at the Harvard H. Chan School of Public Health and Kennedy School of Government. Moon writes the agency should help advance research on the virus, ensure the affordability of drugs and vaccines, and [communicate to an uneasy global public](#) that Zika can be controlled."

[Gabriella Meltzer](#) contributed to this report.

### Additional Resources

The World Health Organization issued this [statement on the Zika virus](#) and clusters of microcephaly cases and neurological disorders.

CFR's Laurie Garrett warns that the Zika virus [could become endemic](#) to the Western Hemisphere in this *Foreign Policy* article.

The *New Yorker's* Carolyn Kormann looks at the [spread of Zika](#) to the Western Hemisphere in recent years.

In this *New York Times* op-ed, Brazilian rights activist Debora Deniz argues that the Zika epidemic [mirrors social inequalities](#) in her country.

Laurie Garrett and Brazilian public health official Cláudio Maierovitch Pessanha Henriques [discuss the outbreak](#) in this CFR Conference Call.

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Author:

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, Senior Fellow for Global Health

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[Laurie Garrett](#)

, Senior Fellow for Global Health

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