

Zika

From obscurity, to emergency, to enduring public health threat

UPDATE

On April 4, 2017, a CDC report announced that of the 250 pregnant women who had confirmed Zika infection in 2016, 24 – or about 1 in 10 of them – had a fetus or baby with Zika-related birth defects. In 2016, nearly 1,000 pregnant women from 44 states who completed their pregnancies had some laboratory-based evidence of a recent Zika infection.

BACKGROUND



Before the 2015 arrival of Zika virus in the Western Hemisphere, a mosquito bite had never before been linked to a devastating birth defect. In **February 2016**, following the World Health Organization's declaration that the virus and the accompanying impacts of microcephaly and Guillain-Barré syndrome constituted an international public health emergency, the Obama Administration asked Congress to allocate \$1.9 billion in emergency funds to combat the outbreak. Zika had then been reported in 26 countries. Sexual transmission of the virus was subsequently confirmed and found to further complicate efforts to prevent its spread and resulting harms. It was not until **September 28, 2016**, however, that Congress responded to the White House request for emergency funding with an allocation of \$1.1 billion. By then, U.S. States and Territories were home to 25,000

people who had been diagnosed with Zika virus, more than 2,300 of whom were pregnant women. By then, the virus had been reported to be locally transmitted in 73 countries.

1947-2007 - The Zika virus, discovered in a sentinel monkey in the Zika forest of Uganda during surveillance for yellow fever in 1947, was first detected in humans five years later. It wasn't until 1964 that scientists confirmed the virus caused illness in humans, with a painless rash its most outstanding symptom. The virus continued to appear in sporadic human cases across tropical sub-Saharan Africa and then in tropical Asia, causing 14 confirmed cases of illness before its appearance in Micronesia in 2007. The finding then that the virus caused more than a hundred confirmed and probable illnesses on one small island of 11,250 people suggested its incidence had been under-reported in places with little public health infrastructure, and also suggested the potential for accelerated transmission of the virus where no previous exposure provided population immunity.

2013-2015 - The virus spread in other Pacific island groups, including French Polynesia, causing thousands of suspected infections in 2013 through 2015. In May 2015, following reports of 7,000 cases of illness with skin rash across Brazil, tests confirmed the Zika virus was being locally transmitted in the Western Hemisphere for the first time. Within two months, health authorities in north-eastern Brazil reported increased neurological disorders. On October 30, health authorities noted an unusual rise in the numbers of babies born with microcephaly – 54 between the preceding August and the end of that month. When, in late November investigators in French Polynesia reported a marked increase of neurological malformations in fetuses and babies there from 2014 to 2015 with at least 17 cases that included microcephaly, Brazil had already declared a public health emergency. As the numbers of babies born with microcephaly continued to rise in Brazil, the virus spread through Latin America and the Caribbean as well as the West African island nation of Cabo Verde.

2016 - In January 2016, after a woman in Hawaii who had travelled to Brazil early in her pregnancy gave birth to the first child born with Zika-associated microcephaly on America soil, and the CDC advised pregnant women to avoid travel to places of active Zika transmission, the White House issued its request for \$1.9 billion in emergency funds to fight the continued spread of the virus. Following its February declaration that the spread of Zika and its impacts constituted a public health emergency of international concern, the WHO issued a strategic plan calling for international, coordinated responses to protect women in affected areas from Zika infection, strengthen vector control and public health education, build capacities to monitor and track spread of the virus, provide access to diagnostic and family planning tools in areas of active transmission, and to prepare responses for critical health needs anticipated to arise on an increasingly large and unprecedented scale in the months ahead. In early April, with no response to its funding request from Congress, the White House moved \$589 million (\$510 million from funding dedicated to Ebola control, and \$79 million within the Department of Health and Human Services from its strategic drug stockpile and other prevention programs responding to emerging and resurging health threats) to Zika responses. In April, the United States Centers for Disease Control and Prevention's confirmation that Zika infection during pregnancy causes microcephaly and other neurological birth defects reinforced the need for emergency funding, to which Congress had yet to respond. In July, having failed to agree on either the amount or conditions

for Zika response funds, Congress recessed. As July ended, the CDC confirmed that cases diagnosed in Miami, Florida were the result of the first confirmed local, mosquito-borne transmission of the virus in the continental United States. By August 1, the agency announced that the first of more than a dozen cases of local transmission had occurred in mid-June, and issued an unprecedented warning against travel to a destination within the continental United States. On November 18, 2016 the World Health Organization emergency committee on Zika declared an end to the public health emergency phase of the international response, and concluded that the spread of the virus and its confirmed impacts of disabling neurological birth defects and the paralyzing Guillain-Barre syndrome constitute a critical and enduring threat to public health.

THE RESPONSE

By the end of September 2016 when Congress responded to the February White House request for emergency Zika funding with an allocation of \$1.1 billion, the United States was among 73 countries and territories reporting mosquito-borne Zika transmission since 2007, and one of 47 in the Western Hemisphere seeing its first local outbreak of the virus. It was one of 12 countries reporting sexual transmission of the virus. The number of countries and territories reporting neurological defects resulting from local transmission among newborns was up to 21 in the last week of September. The number of countries and territories reporting Zika-associated Guillain Barré syndrome had risen to 18. The 2,300 pregnant women among the 25,000 Americans who had been infected with Zika by September 2016 serve as an indication of challenges ahead. By September, the virus had caused the deaths of two adult Americans.

While the rate of risk for birth defects associated with the virus remains unquantified, the unmet need for contraception in Puerto Rico is reflected in estimates that two-thirds of pregnancies there are unintended, and the CDC projection that hundreds of infants could be born with microcephaly or other birth defects in Puerto Rico during the next year. The arrival of the congressionally approved funding will allow the start of more intensive and accelerated research to better understand the virus and its impacts, to follow the outcomes of pregnant women and their children infected with Zika, as well as the continuation of work to develop a vaccine to protect against the virus, and diagnostic tools to speed and facilitate detection of the virus. At least five vaccine candidates at different stages of development were being investigated by scientists at the National Institutes of Health and the Biomedical Advanced Research and Development Authority in late September, and preparations had begun for a clinical trial of one of those to begin in January 2017. **As of March of 2017, scientists from the National Institute of Allergy and Infectious Diseases have begun a Phase II trial of a Zika vaccine – the only experimental Zika vaccine that has gone beyond initial safety testing.** Funding that had been redirected from programming responding to the West Africa Ebola outbreak to Zika responses from April to September was not reimbursed.

A RESEARCH AGENDA AND LONG-TERM PROGRAMS

Experts have concluded that the Zika virus will continue to spread everywhere mosquitos capable of transmitting the virus are found. Wide geographical distribution of those mosquitos, lack of population immunity in areas where the virus is spreading, and the mildness or absence of symptoms, all greatly complicate surveillance and efforts to monitor potential impacts. Researchers now describe a congenital syndrome that encompasses a range of developmental, hearing, and vision disabilities among infants born to Zika-infected mothers and say the definition of the syndrome continues to expand.

The WHO strategic response plan to the emerging Zika outbreak called for about \$112 million, of which just a little over \$50 million was raised. While most of the money raised came from emergency resources allocated to emergencies, the research questions raised by Zika will require long-term efforts with sustained funding. The [Zika Virus Research Agenda](#) released by the WHO in October 2016 delineates needs to track the spread of the virus, to develop tools to diagnose, prevent and treat the virus, to improve understanding of its impacts, to inform and build services to reach women, communities and health systems, and to prepare for and enable services for those affected by the virus.

ONGOING

The known history of the virus and its impacts demonstrates once again the potential for infectious diseases to move swiftly from obscurity to crises of global proportions and has highlighted the need for an emergency fund that allows agile and immediate response to emerging public health threats. The questions surrounding Zika, its ongoing impact and continued spread illustrate the need for, and will continue to demand strongly supported and comprehensive efforts in basic science, applied epidemiology, clinical care delivery, and surveillance to improve domestic and global capacities to combat, predict, and prevent current and future worldwide crises caused by emerging infectious diseases. **Updated April 4, 2017**

For more information, or to contact an expert:

IDSA Global Health

1300 Wilson Boulevard, Suite 300, Arlington, VA 22209

(p) 703-740-4955 (fax) 1-866-536-6638 (e) globalhealth@idsociety.org

See: www.idsociety.org/zika and www.sciencespeaksblog.org