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Zika Virus in Latin America and the Caribbean: U.S. Policy Considerations

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Summary

Congress is debating how to respond to an ongoing outbreak of Zika virus, a mosquito-borne illness that has no treatment or vaccine and can cause microcephaly—a severe birth defect—and other neurological complications. As of June 16, 2016, 60 countries and territories had reported mosquito-borne transmission of the virus, 39 of which are in Latin America and the Caribbean and are reporting cases of Zika for the first time. Brazil, which has registered the most confirmed cases of Zika in Latin America, will host the summer Olympics in August 2016. Scientists expect that travel destinations in the Caribbean will see more cases as the summer's warm, rainy season continues. More than 750 U.S. citizens, including pregnant women, have become infected through either travel or sexual transmission.

Frequent business and tourist travel, combined with the close proximity and similar climates of Latin America and the southern United States, means that mosquito-borne Zika infections are likely in the United States. Zika is primarily spread by *Aedes* mosquitoes—primarily *Aedes aegypti* but also *Aedes albopictus*, the latter of which is present in a majority of U.S. states. Local (or mosquito-borne) transmission has not yet occurred in the continental United States but is occurring in Puerto Rico and the U.S. Virgin Islands.

On February 8, 2016, the Obama Administration submitted an emergency request for almost $1.9 billion in supplemental funding to respond to the Zika outbreak, including $526 million for international efforts. On April 6, 2016, the Administration announced that it would reprogram $589 million in unobligated funds, including $510 million in Ebola supplemental funds, for efforts to address the Zika outbreak. The U.S. Agency for International Development (USAID) is reprogramming $215 million of that funding—including a $78 million transfer to the U.S. Centers for Disease Control and Prevention (CDC)—for international efforts. In mid-May 2016, both the House and the Senate passed supplemental appropriations measures for Zika response. The House bill, H.R. 5243, would provide $622.1 million in Zika funding and rescind an equal amount of budget authority. The Senate measure (S.Amdt. 3900 to H.R. 2577, the combined FY2017 Military Construction-Veterans Affairs and Transportation-Housing and Urban Development appropriations bills) would provide $1.1 billion in Zika response funding without rescissions. On June 23, 2016, the House agreed to a conference agreement (see H.Rept. 114-640) that would provide $1.1 billion for Zika response, including $175.1 million for State Department and USAID activities. On June 28, 2016, the Senate voted not to invoke cloture on the conference agreement.

The number of people in the Western Hemisphere affected by Zika is unknown, but as many as 4 million people may be at risk of infection in 2016, and nearly all countries in Latin America and the Caribbean have recorded cases of the virus. Zika responses in the region have been led by Brazil and Colombia, multilateral organizations such as the World Health Organization (WHO)/Pan American Health Organization (PAHO), and the U.S. government. Health experts have expressed concerns about the capacity of health systems—particularly in Central America and the Caribbean—to prevent, diagnose, and care for Zika cases and associated complications, particularly among pregnant women. Related issues of interest to Congress include how to balance support for U.S. initiatives and multilateral approaches, the proper scope and components of U.S. health assistance to the region, and funding for pandemic preparedness and research on neglected tropical illnesses in Latin America.

This report focuses on the Latin American dimensions of the Zika virus. For more information, see CRS Report R44549, *Supplemental Appropriations for Zika Response: The FY2016 Conference Agreement in Brief*, by Susan B. Epstein and Sarah A. Lister This report will be updated periodically.

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Introduction

As of June 16, 2016, the World Health Organization (WHO) reported that 60 countries worldwide had experienced mosquito-borne transmission of Zika, 46 of which had never had Zika cases before (see **Figure 1**).[1] The U.S. Centers for Disease Control and Prevention (CDC) has concluded that Zika causes microcephaly (a serious birth defect involving brain damage) and is associated with Guillain-Barré syndrome (GBS, a neurological condition) and other neurological and autoimmune conditions. Latin America and the Caribbean have been most affected by this outbreak (**Figure 1**). Since February 2016, new cases in the southern parts of the region have decreased, but an increase in new cases is expected in the Caribbean during the summer months as mosquitoes hatch and bite. The United States will likely experience an increase in travel-associated cases and possibly local transmission.[2] Policymakers are concerned about the spread of Zika into the continental United States, as well as the potential that visitors traveling to the Olympics in Brazil in August could contract the virus and bring it back to their home countries.

In February 2016, WHO Director-General Margaret Chan announced that the International Health Regulations (2005) Emergency Committee on Zika virus had determined that the Zika outbreak was a Public Health Emergency of International Concern (PHEIC).[3] Shortly thereafter, President Barack Obama requested that Congress provide almost $1.9 billion in emergency appropriations to fund domestic and international responses to the outbreak. A conference agreement on Zika funding was approved by the House but remains pending in the Senate.[4] As Congress considers funding the Zika request and then exercises oversight over U.S. Zika responses in Latin America and the Caribbean, Members may consider issues such as the following:

- **Balance between U.S. bilateral and multilateral Zika responses.** Although U.S. health assistance (bilateral and regional) to Latin America in general has declined, U.S. support for the Pan American Health Organization (PAHO)[5] has increased. While considering the President's Zika request and the FY2017 budget request, Congress may discuss how much support to provide for multilateral responses in the region led by PAHO.
- **U.S. health programs in Latin America as a part of U.S. policy toward the region.** On average, roughly 10%-20% of the funds provided by the State Department and the U.S. Agency for International Development (USAID) for Latin America between FY2009 and FY2016 have been aimed at health programs. The WHO has recommended that women and men in countries with local transmission[6] of Zika be correctly informed and oriented to consider delaying pregnancy.[7] Congress may evaluate reproductive health and family planning funding in the region given the WHO recommendation and the limited access to sexual education and contraception in the region.

[1] WHO, *Situation Report: Zika Virus, Microcephaly, Guillain-Barré Syndrome,* June 16, 2016.

[2] Ibid.

[3] WHO, "WHO Statement on the First Meeting of the International Health Regulations (2005) Emergency Committee on Zika Virus and Observed Increase in Neurological Disorders and Neonatal Malformations," February 1, 2016.

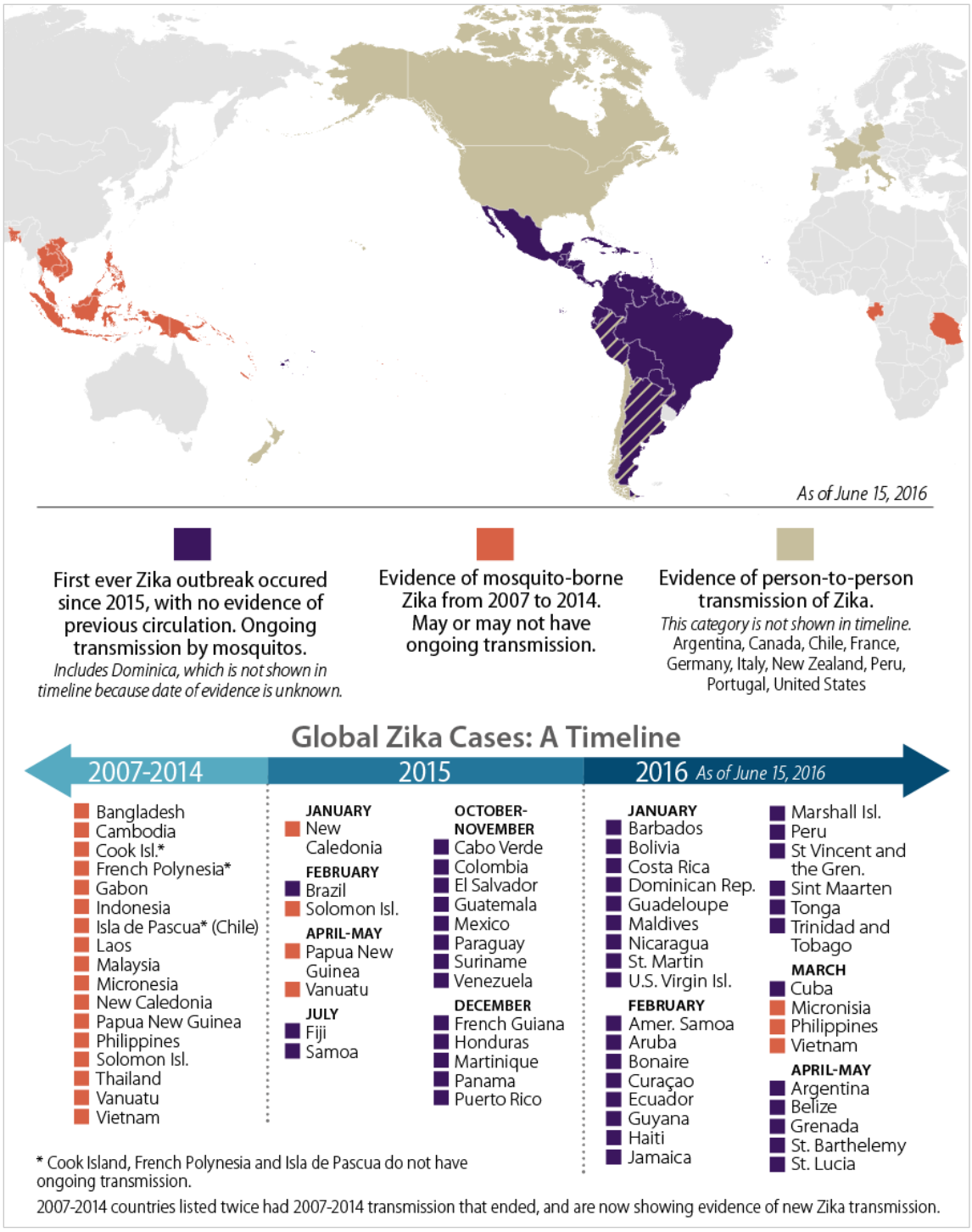
[4] CRS Report R44460, *Zika Response Funding: Request and Congressional Action,* coordinated by Susan B. Epstein.

[5] PAHO is the WHO's regional office for the Americas.

[6] Local transmission means that mosquitoes in the area have been infected with the virus and are spreading it to people.

[7] WHO, *Prevention of Sexual Transmission of Zika Virus: Interim Guidance Update,* June 7, 2016.

Figure 1. Global Transmission of Zika: 2007-2016



Source: Adapted by the Congressional Research Service (CRS) from World Health Organization (WHO), *Zika Virus, Microcephaly, Guillain-Barré Syndrome*, June 16, 2016.

Notes: Zika virus is not necessarily present throughout the countries/territories shaded in this map.

- **Regional apportionment and components of global health budget.** Less than 5% of all U.S. global health funds are provided to Latin America, and the majority of these funds are for HIV/AIDS programs. On average, health indicators in the region—particularly those related to maternal and child health, family planning, and reproductive health—are better than in other low- and middle-income countries, although inequities exist.[8] Congress might reexamine the apportionment of global health funding and consider whether investments in the region are sufficient to meet emerging health concerns.
- **Funding for pandemic preparedness.** The United States committed to support 30 countries (including Haiti and Peru) and the Caribbean Community (CARICOM)[9] in bolstering their ability to respond to disease outbreaks through the Global Health Security Agenda (GHSA).[10] Congress included almost $600 million in emergency Ebola appropriations to the CDC in support of GHSA and $50 million in FY2016 appropriations to USAID for pandemic preparedness activities. Congress might consider funding levels for those programs and where those funds are allotted.
- **Investments in research and development of neglected diseases.** In recent years, *Aedes* mosquitoes have caused three disease outbreaks (dengue, chikungunya, and Zika) in Latin America and the Caribbean, all of which have been imported into the United States, with the latter being only travel-associated at the time of this report. These and other diseases lack vaccines to prevent transmission, treatment regimens, and effective vector control tools. Congress might evaluate options to address threats from new and reemerging diseases, including those that are mosquito-borne.

This report provides background information on the Zika virus, discusses challenges faced by governments and implementing partners in the Latin America and Caribbean region that are attempting to control the ongoing outbreak, and analyzes the above issues in the context of the U.S. Zika response.

Background

Zika was discovered in the Zika forest of Uganda in 1947. From that time until 2007, when the first large Zika outbreak was recorded, Zika virus infection primarily caused mild symptoms (fever, skin rash, conjunctivitis, muscle and joint pain) that resolved within one week.[11] In 2007, the first large Zika outbreak was recorded on the Micronesian island of Yap. Household surveys detected 185 cases.[12]

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[8] As an example, children from low-income families are five times as likely to die before the age of five than children from wealthier households. World Bank, "Latin America: Unequal Access to Health Care Is Still No. 1 Killer for Moms and Kids," September 11, 2013.

[9] CARICOM is a grouping of 20 countries: 15 member states and five associate members. The 15 member states are Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. The five associate member states include Anguilla, Bermuda, the British Virgin Islands, the Cayman Islands, and Turks and Caicos.

[10] For background on GHSA, see CRS In Focus IF10022, *The Global Health Security Agenda and International Health Regulations*, by Tiaji Salaam-Blyther.

[11] WHO, *Zika Virus*, April 15, 2016.

[12] M. K. Kindhauser et al., "Zika: The Origin and Spread of a Mosquito-Borne Virus," *Bulletin of the World Health*

Scientists are studying the virulence of the Zika virus and the extent to which human activity affects global spread.[13] Retrospective studies of a 2013-2014 outbreak in French Polynesia linked Zika infection with GBS for the first time.[14] The current outbreak, which began in Brazil, has been accompanied with a spike in microcephaly and GBS cases, as well as other neurological and autoimmune disorders.[15] As of June 16, 2016, WHO has reported more than 1,600 cases of Zika-related microcephaly worldwide—almost all in Brazil. In addition, 13 Zika-affected countries have recorded an increased incidence of GBS.[16]

Aedes-Related Outbreaks in Latin America and the Caribbean

In the last century, Latin American and Caribbean countries have transformed from largely rural to mostly urban societies, with some 80% of all people in Latin America and the Caribbean now living in urban areas. Throughout the region, millions of people live in densely populated urban slums and poor rural communities where homes and other facilities lack air conditioning or window screens. Lack of proper plumbing and poor sanitation facilitate mosquito breeding, as mosquitoes can lay their eggs in standing water.[17] *Aedes* mosquitoes thrive in such conditions, biting during the day and breeding indoors and out.[18]

Health threats to Latin American and Caribbean populations may also be exacerbated by the 2015-2016 El Niño weather pattern, which is reflected in unusually warm water in the eastern equatorial Pacific Ocean. The present El Niño phenomenon, which has been particularly strong, has produced multiyear droughts in some areas (Colombia, Venezuela, and northern Central America) and extreme flooding in others (Argentina, Uruguay, and Paraguay). The warm, wet weather has facilitated the proliferation of mosquitoes, and human responses to drought conditions have provided favorable conditions for mosquito breeding because more people have been storing water.[19] Studies have also linked climate change with greater health threats, such as increasing prevalence of malaria, chikungunya, and dengue fever.[20] In recent years, *Aedes*

Organization, February 9, 2016.

[13] Lulan Wang et al., "From Mosquitoes to Humans: Genetic Evolution of Zika Virus," *Cell Host & Microbe*, vol. 19 (May 11, 2016).

[14] Kindhauser, "Zika.". GBS is a condition in which a person's immune system attacks the peripheral nerves. Many people who develop GBS recover fully, including those with severe GBS. Severe cases of GBS are rare but can result in death. For more information on GBS, see WHO, *Guillain-Barré Syndrome*, March 14, 2016.

[15] Microcephaly is a condition in which a baby is born with a small head or the head stops growing after birth. Some babies born with mild microcephaly can live normal lives, while most babies born with severe microcephaly can experience epilepsy, cerebral palsy, learning disabilities, hearing loss, and vision problems over their lifetimes. See WHO, *Microcephaly*, March 2, 2016.

[16] WHO, *Situation Report*.

[17] According to the World Bank, at least 110 million people in Latin America lack access to modern sanitation. World Bank, "Monitoring Country Progress in Water and Sanitation," June 13, 2014.

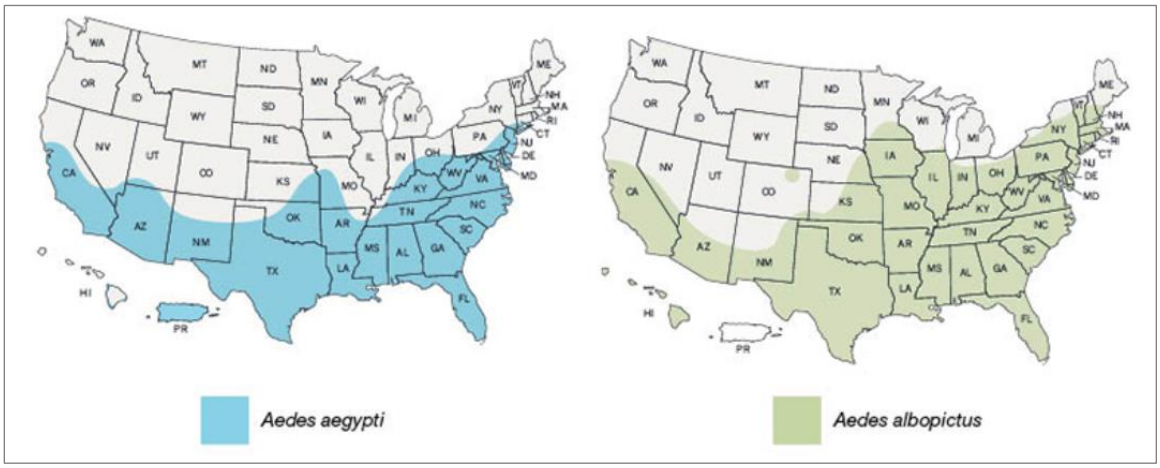
[18] CRS In Focus IF10353, *Mosquitoes, Zika Virus, and Transmission Ecology*, by M. Lynne Corn, Tadlock Cowan, and Robert Esworthy.

[19] WHO, "El Niño May Increase Breeding Grounds for Mosquitoes Spreading Zika Virus, WHO Says," February 22, 2016.

[20] Sonia Altizer et al., "Climate Change and Infectious Diseases: From Evidence to a Predictive Framework," *Science*, vo. 341 (August 15, 2013), p. 514.

mosquitoes have spread chikungunya,[21] dengue,[22] and Zika across the Americas. All three of these diseases have been imported into the United States and can become locally transmissible because the *Aedes* mosquito resides in large segments of the United States.

Figure 2. Estimated Range of *Aedes* Mosquito in the United States



Source: CDC, "Estimated Range of *Aedes aegypti* and *Aedes albopictus* in the United States, 2016 Maps," http://www.cdc.gov/zika/vector/range.html, accessed on May 23, 2016.

Notes: Maps represent an estimate of the potential range of the *Aedes* mosquito. They are not intended to represent risk for spread of Zika.

Zika in Latin America and the Caribbean

Scientists are unsure how many people have been infected by Zika in the Western Hemisphere, but as many as 4 million people may be at risk of infection, and nearly all countries have recorded cases.[23] As of June 16, 2016, Brazil had 159,914 suspected Zika cases, almost 40,000 of which have been confirmed through diagnostic testing (see **Figure 3**).[24] Since the outbreak began in

[21] Chikungunya is a virus that can cause fever and severe joint pain, which can be debilitating. Other symptoms typically include nausea, fatigue, rash, and muscle pain. There is no antiviral treatment or vaccine. From 2013 through 2015, more than 1.7 million people contracted the disease, and 258 people died. During that time period, CDC estimated that 3,113 cases were imported into the United States and 11 cases were contracted locally in Florida. From the beginning of 2016 through June 17, 2016, PAHO/WHO reported 130,138 chikungunya cases in the region, of which 18,220 have been confirmed. On May 31, 2016, the Texas Department of State Health Services reported the first locally acquired chikungunya case, indicating that mosquitoes within the United States now carry the virus. WHO, "Fact Sheet: Chikungunya," April 2016; U.S. Department of Defense, *Chikungunya in the Americas Surveillance Summary #49*, September 9, 2015; WHO/PAHO, *Number of Reported Cases of Chikungunya Fever in the Americas, by Country or Territory 2016*, June 17, 2016; Texas Department of State Health Service, "DSHS Announces First Texas Acquired Chikungunya Case," press release, May 31, 2016.

[22] Dengue is a virus that can cause severe, flu-like symptoms and can cause death in about 1%-2% of all cases. Severe dengue is evidenced by severe abdominal pain, repeated vomiting, rapid breathing, bleeding gums, or blood in vomit. It is a leading cause of death for children in some Latin American countries. There is no specific treatment for dengue, but a vaccine was introduced in a few countries in late 2015. From the beginning of 2014 through June 17, 2016, PAHO estimated that more than 5 million people had contracted dengue in the region and more than 2,500 people died of the disease. Some 1,299 of these cases occurred in the United States, and no deaths were reported. WHO, "Fact Sheet: Dengue and Severe Dengue," April 2016 and WHO/PAHO, *Number of Reported Cases of Chikungunya Fever in the Americas*.

[23] Greg Botelho, "Zika Virus 'Spreading Explosively,' WHO Leader Says," CNN, February 20, 2016.

[24] PAHO/WHO, *Cumulative Zika Suspected and Confirmed Cases Reported by Countries and Territories in the*

Colombia, the country had recorded 82,935 suspected cases, more than 8,000 of which have been confirmed.[25] Two key factors complicate efforts to count Zika cases:

1. About 75% of infected people do not develop symptoms.
2. The virus is detectable for less than seven days in infected people's blood.[26]

Zika: From Latin America to the United States and U.S. Territories

As of June 16, 2016, all Zika cases detected in the continental United States[27] (755) had been either acquired abroad or sexually transmitted, although the U.S. Virgin Islands, American Samoa, and Puerto Rico have experienced local transmission by mosquito. CDC and other health experts are preparing for the likelihood that the continental United States may experience locally acquired Zika cases this summer.[28] Given the broad range of the *Aedes* mosquitoes (see **Figure 2**) and the fact that mosquito-borne diseases have been imported into the United States previously, a successful response to the Zika outbreak may require U.S.-Latin American cooperation in surveillance, research, and response over several years.

The Zika Virus Outbreak in the U.S. Territories[29]

Although Puerto Rico and the U.S. Virgin Islands are U.S. territories, when it comes to the Zika virus, their locations, climate, and ecology put them in company with much of Latin America and the Caribbean. PAHO is tracking the spread of the Zika virus in Puerto Rico, the U.S. Virgin Islands, and countries across Latin America and the Caribbean. On June 2, 2016, PAHO commented, "A downward trend of cases of Zika virus disease in Central and South America continues to occur while in most Caribbean countries and territories the trend continues to rise."

As of June 15, 2016, none of the 50 U.S. states had identified local transmission of Zika virus. However, local transmission was first identified in Puerto Rico in December 2015 and in the U.S. Virgin Islands in January 2016. Puerto Rico has now identified more than 1,300 laboratory-confirmed cases, including more than 140 pregnant women. Puerto Rico is working with the CDC to actively monitor these women and assure that they and their babies receive the best possible pre- and post-natal care. Full-term babies from the earliest of these pregnancies will be due in mid- to late summer. More than 20 locally acquired cases of the Zika virus have been identified in the U.S. Virgin Islands. Puerto Rico's Zika outbreak comes amid a fiscal emergency in the territory. The Obama Administration has requested assistance for Puerto Rico and the other territories as part of emergency supplemental appropriations for the national and global response to the Zika outbreak. Congress is considering an appropriations package at this time.

Sources and additional information: CRS Report R44460, *Zika Response Funding: Request and Congressional Action*; CRS Report R44275, *Puerto Rico and Health Care Finance: Frequently Asked Questions*; CRS Report R44095, *Puerto Rico's Current Fiscal Challenges*; CDC, "Zika Virus," http://www.cdc.gov/zika/; PAHO, "Zika Virus Infection," http://www.paho.org/zika.

Americas, 2015-2016, June 16, 2016.

[25] Ibid.

[26] CDC, "Interim Guidance for Zika Virus Testing of Urine—United States, 2016," *Morbidity and Mortality Weekly Report*, vol. 65, no. 18 (May 13, 2016).

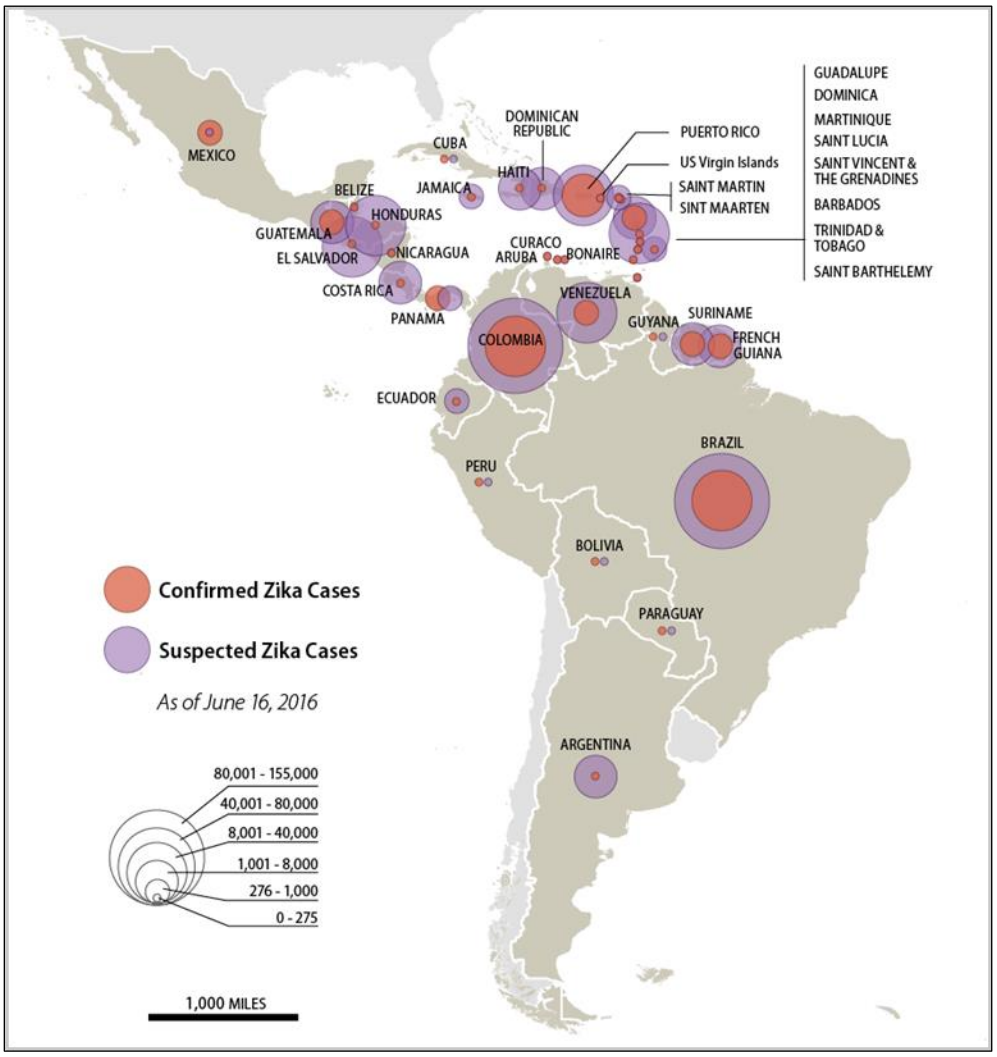
[27] CDC, "Zika Virus Disease in the United States, 2015-2016," http://www.cdc.gov/zika/geo/united-states.html (accessed on June 16, 2016).

[28] Dan Diamond, "Frieden: CDC Will Lose Zika Fight Without Funding," *Político*, May 26, 2016.

[29] This text box was authored by Sarah A. Lister, Specialist in Public Health and Epidemiology.

Figure 3. Confirmed and Suspected Zika Cases by Country

(as of June 16, 2016)



Source: Adapted by WHO/PAHO, *Cumulative Zika Suspected and Confirmed Cases Reported by Countries and Territories in the Americas*, June 17, 2016.

International Zika Responses in Latin America and the Caribbean

Country Efforts

The number of Zika cases, the capacity of health systems to address them and related complications, and the plans to do so vary widely across Latin America and the Caribbean. Haiti, for example, lacks a functioning hospital system, and Venezuela has little capacity to provide basic maternal and child health care at this time. In terms of preparedness and response to epidemiological emergencies, including Zika, recent assessments of core capacities under the International Health Regulations carried out by PAHO have highlighted weaknesses in health system capacity in all Caribbean countries (including Suriname and Guyana), selected countries

of Central America (El Salvador, Guatemala, Honduras, and Nicaragua), Bolivia, and Paraguay. The Inter-American Development Bank (IDB) shares this view.[30]

Experts are concerned that these countries and several others are much less equipped than Brazil and Colombia—two of the six countries in the Americas that PAHO deemed capable of handling a pandemic illness in 2012—to address Zika and related health consequences.[31] Inadequate laboratory and diagnostic capacity, poor access to sexual education and contraception, and resistance to national mosquito control efforts due to mistrust of government authorities have hindered efforts in some countries. Gang violence and insecurity have also reportedly prevented health workers from providing services in some parts of El Salvador and Honduras.

Should Zika-associated cases of microcephaly become more common outside of Brazil, the health systems in the region may come under strain. Most countries in Latin America and the Caribbean lack the capacity to treat children born with severe birth defects and do not generally permit abortion.[32] Lifetime care for a child with microcephaly can be expensive. In the United States, such care can cost up to $10 million.[33] Brazil has struggled to care for infants with microcephaly, many of whose families live hours from one of the few hospitals that can provide care.

Brazil[34]

Brazil has been at the epicenter of the ongoing Zika outbreak, with 159,914 suspected Zika cases since the beginning of the current outbreak, of which 39,993 have been confirmed as of June 16, 2016.[35] On November 11, 2015, Brazil's Ministry of Health declared a Public Health Emergency of National Importance in response to a sharp increase in the number of infants born with microcephaly. Whereas fewer than 200 cases of microcephaly were reported annually in Brazil prior to 2015, Brazil's Ministry of Health detected 1,581 microcephaly cases between the start of 2015 and June 16, 2016.[36]

In Brazil, as in most countries in Latin America, a diagnosis of microcephaly in utero does not meet the government's standards under which abortion is permissible.[37] As a result, Brazil's Ministry of Health has issued guidelines for providing physical and occupational therapy to children born with microcephaly and is certifying hospitals capable of providing care to those infants. Brazil's congress passed a law to provide a small monthly stipend to families caring for microcephalic children, many of whom are led by single mothers who have lost the ability to maintain employment due to the type of care microcephalic babies require. Many observers are concerned that there may be a rise in illegal abortions (and possibly maternal mortality due to unsafe abortions) in Brazil as a result of increasing diagnoses of microcephaly.[38]

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[30] CRS correspondence with health experts at the Inter-American Development Bank, June 22, 2016.

[31] PAHO, *Strategic Plan of the Pan-American Health Organization: 2014-2019*, September 2013. As of 2012, PAHO deemed six countries—Brazil, Canada, Chile, Colombia, Costa Rica, and the United States—capable of addressing pandemic outbreaks.

[32] Guttmacher Institute, "Fact Sheet: Abortion Laws in Latin America and the Caribbean," May 2016.

[33] National Public Radio, "CDC Waits for Congress to Approve Emergency Funds to Combat Zika," May 17, 2016.

[34] Peter J. Meyer, Analyst in Latin American Affairs, contributed to this section. For more on Brazil, see CRS Report RL33456, *Brazil: Background and U.S. Relations*, by Peter J. Meyer.

[35] WHO, *Situation Report*.

[36] Ibid.

[37] Marcia Castro, "Zika Virus and Health Systems in Brazil: From Unknown to a Menace," *Health Systems & Reform*, May 3, 2016.

[38] Brent McDonald, "Brazil's Abortion Restrictions Compound Challenge of Zika Virus," *New York Times*, May 18,

The Brazilian government has launched a National Plan to Combat the *Aedes* Mosquito and Microcephaly, which includes research, prevention, and mosquito control efforts, as well as health assistance for pregnant women and children. Brazil has several world-class research institutions with vast experience in tropical diseases, and the country's national public health institutions are working with local and international partners to develop more efficient diagnostic kits, antiviral drugs, and a Zika vaccine.[39] The government has dispatched 220,000 troops and 300,000 health agents to communities around the country to educate the population and eliminate mosquito breeding grounds. Officials have placed particular focus on mosquito-control efforts in Rio de Janeiro, which is scheduled to host the 2016 Summer Olympic Games in August.

2016 Summer Olympics in Rio de Janeiro, Brazil, and the Zika Outbreak

Ongoing debate concerns whether the arrival of hundreds of thousands of tourists to Rio de Janeiro, Brazil, in August for the summer Olympics will hasten the global spread of the Zika virus. For some time, Brazilian officials have sought to assuage the fears of athletes and fans by pointing out that the Olympics will be occurring during the dry, winter season in Brazil, when fewer mosquitoes are present, and that all the venues and hotel areas will be regularly fumigated in preparation for the games. Regardless of those assurances, some health officials have called for the Olympics to be postponed or called off entirely. They have expressed concern that the strain of Zika present in Brazil, which has been linked to microcephaly and neurological problems, has been exported to Cape Verde, Africa. In May 2016, 150 health experts and bioethicists wrote an open letter to the WHO director-general urging her to recommend postponing the Olympics. In addition, some widely known athletes have indicated that they will skip the Rio Olympics due to concerns about the Zika virus.

Others oppose the proposal, noting that nonpregnant travelers going to Brazil can take sensible precautions to avoid mosquito bites and, upon returning home, use mosquito repellant (to avoid infecting mosquitoes) and use condoms to prevent sexual transmission of Zika. WHO made earlier statements indicating that "cancelling or changing the location of the 2016 Olympics will not significantly alter the international spread of Zika virus." On June 14, 2016, the WHO Emergency Committee on Zika met and reaffirmed its decision that "there is a very low risk of further international spread of Zika virus as a result of the Olympic and Paralympic Games as Brazil will be hosting the Games during the Brazilian winter when the intensity of [local] transmission of arboviruses, such as dengue and Zika viruses, will be minimal." U.S. epidemiologists calculated that the Olympic visitors would account for only 0.25% (i.e., less than 1%) of the total risk for spreading Zika through air travel.

Sources: Lena H. Sun, "150 Experts Say Olympics Must Be Moved or Postponed Because of Zika," *Washington Post*, May 27, 2016; WHO, "WHO Statement on the Third Meeting of the International Health Regulations (2005) (IHR(2005)) Emergency Committee on Zika Virus and Observed Increase in Neurological Disorders and Neonatal Malformations," June 14, 2016; Reuters, "New Research Finds Low Risk of Zika Virus at Olympics,' June 7, 2016.

Some observers have expressed concerns about the adequacy of Brazil's efforts, particularly in low-income areas. Although Brazil has one of the most advanced public health systems in Latin America, significant discrepancies exist in the quality of prenatal care and child mortality rates between the poor north and northeast regions, where many Afro-descendants live (and many Zika cases have been concentrated), and the wealthier south.[40] Reports also indicate that many states in Brazil's northeast region ran out of mosquito larvicide last year and that the country's fiscal challenges and political instability have inhibited some Zika responses this year.[41]

2016.

[39] Luiz Alberto Figueiredo Machado, "Brazil Is Doing Its Part in the Global Fight Against Zika," *Americas Quarterly*, February 4, 2016.

[40] Kwame A. Nyarko et al., "Explaining Racial Disparities in Infant Health in Brazil," *American Journal of Public Health*, 2013, p. 103; Olga Khazan, "What the U.S. Can Learn from Brazil's Healthcare Mess," *The Atlantic*, May 8, 2014.

[41] Castro, 2016; Stephen Eisenhammer and Pedro Fonseca, "Brazil Health Service Cracking Under Strain of Microcephaly," Reuters, February 23, 2016.

Colombia

Colombia has the second-most cases of reported Zika virus infection in the Western Hemisphere. As of June 16, 2016, Colombia had reported 82,935 suspected cases, roughly 8,000 of which have been confirmed.[42] Two-thirds of Colombia's municipalities have reported suspected or confirmed cases, and Colombia's National Institute of Health estimates that between 200,000 and 300,000 people may contract the disease in the country by the end of 2016.[43]

Similar to Brazil, Colombia has a relatively sophisticated public health system. Over the past several years, Colombia has spent a little over $15 million annually on combating contagious pathogens. It plans to maintain that funding level in 2016.[44] The Colombian Ministry of Health issued a Zika virus risk-based preparedness and response plan in January 2016 that included four key elements:

1. Strengthening the national system of epidemiological surveillance;
2. Training health personnel on early detection, diagnosis, and management of Zika cases;
3. Coordinating Zika awareness, prevention, and response activities; and
4. Bolstering health care services to improve capacity to address Zika cases and related illnesses and to implement guidelines for comprehensive care of patients.

In January 2016, the Colombian Minister of Health visited the main cities around the country to raise awareness about Zika and build support for countering the disease among local health officials. The Ministry of Health also released policy recommendations that advised couples in affected areas to use contraceptive methods to prevent possible sexual transmission of the virus and postpone pregnancy. The government allotted an additional $1.4 million to purchase necessary supplies and improve institutional support to prevent and combat Zika.

As of June 16, 2016, Colombia had seven confirmed cases of microcephaly.[45] Some experts predict that Colombia may see an increase in microcephaly cases in the coming months because its Zika outbreak began roughly six months after Brazil's. Others maintain that numbers may not grow significantly because abortion is legal under certain circumstances in the country, and some pregnant women may opt to abort after a prenatal microcephaly diagnosis.[46] Colombian officials predict that about 300 Zika-linked microcephaly cases may be diagnosed between May and September 2016.[47] The government is working with the U.S. CDC to monitor and treat women infected with the Zika virus.

[42] WHO/PAHO, *Cumulative Zika Suspected and Confirmed Cases*.

[43] CRS communication with the Ministry of Health in Colombia, May 23, 2016.

[44] Ibid.

[45] WHO, *Situation Report*.

[46] Colombian law reportedly allows abortions for pregnancies resulting in "malformations incompatible with life," as well as those that pose a "risk the physical, mental, or social health" of a woman. See Justin Calderon, "Colombia's Pro-Lifers Are Objectively Pro-Zika," *Foreign Policy*, April 18, 2015.

[47] CRS communication with the CDC on May 19, 2016; *El Colombiano*, "En Colombia Hay Cinco Casos Confirmados de Microcefalia por Zika," May 21, 2016.

Multilateral Organizations

WHO and PAHO

In 2015, Brazil experienced an unusual spike in microcephaly cases. Evidence later emerged linking Zika with microcephaly. The phenomenon prompted WHO Director-General Margaret Chan to convene an emergency committee on Zika virus to discuss four key issues:

5. The association of Zika infection with birth malformations and neurological syndromes;
6. The potential for further international spread of the virus given the wide geographical distribution of the mosquito vector;
7. The lack of population immunity in newly affected areas; and
8. The absence of vaccines, specific treatments, and rapid diagnostic tests.[48]

Upon recommendations of the emergency committee, Chan declared that the Zika outbreak was a PHEIC in February 2016. A PHEIC declaration signals that the health event may require immediate international action and often prompts a coordinated, multinational response. Also in February, the WHO released an interim Strategic Response Framework and Joint Operations Plan to guide the international response to the outbreak and related complications from January 2016 to June 2016. The plan focused on the following:

- Strengthening disease surveillance,
- Building laboratory capacity to detect the virus,
- Bolstering mosquito control,
- Providing care for infected persons, and
- Defining and supporting priority research areas.[49]

The plan asked for donors to provide $25 million to WHO (to coordinate and support global responses to the outbreak and scientific studies on the virus) and PAHO (to coordinate and support implementation of responses in the Americas). The remaining $31 million in funds was requested for partner organizations, including the U.N. Children's Fund (UNICEF) and U.N. Population Fund.[50]

Due to sluggish contributions, in May 2016, U.N. Secretary General Ban Ki-moon announced the establishment of a U.N. Zika Response Multi-Partner Trust Fund to attract support for unfunded priorities outlined in the aforementioned WHO strategic framework. As of June 22, 2016, donors had provided more than $4 million (16%) to the WHO/PAHO portion of the request.[51] In addition, WHO released $3.8 million in emergency support for the Zika response. WHO and PAHO do not count the emergency funds toward fundraising goals, as these funds are to be reimbursed.

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[48] WHO, "WHO to Convene an International Health Regulations Emergency Committee on Zika Virus and Observed Increase in Neurological Disorders and Neonatal Malformations," January 28, 2016.

[49] WHO, *Zika Virus Outbreak Global Response: Interim Report*, May 27, 2016.

[50] UNICEF is working with governments and local communities to prevent the spread of Zika by eliminating mosquito breeding sites and distributing insect repellant and bed nets. UNICEF is also providing support for the care of infants born with microcephaly. The U.N. Population Fund is helping women of childbearing age in Zika-affected countries access information about Zika in pregnancy, contraception (to reduce the risk of contracting Zika while pregnant), and counseling services.

[51] WHO, *Zika: Response Funding*, June 22, 2016, http://who.int/emergencies/zika-virus/response/contribution/en.

On June 16, 2016, WHO issued a revised $122 million Zika Strategic Response Plan to guide international efforts from July 2016 through December 2017.[52] The plan describes how the WHO/PAHO and 60 partner organizations aim to bolster detection, prevention, care and support, and research on Zika and related complications. It prioritizes support for women of childbearing age and their partners in communities affected by Zika. In addition, the plan urges countries and donors to bolster investments in counseling, reproductive health services, abortions (where legal), and postnatal follow-up and care for women who have been infected with Zika and for children born with microcephaly. It also calls for expanding services and research on GBS.

Since 2015, PAHO has been working with the U.S. CDC, USAID, National Institutes of Health (NIH), U.S. Department of Defense (DOD), and other leading research entities in the region to fill in significant knowledge gaps about Zika, its transmission, and its complications and to develop new diagnostic tests and hasten progress toward creating a vaccine. PAHO has partnered with governments, U.N. entities, multilateral development banks, and private organizations on disease surveillance, mosquito abatement, community engagement and education campaigns on personal protection, and services for those affected. PAHO, the World Bank, and the IDB have developed an assessment tool that measures country capacity to handle anticipated Zika cases and accompanying complications.[53]

World Bank

In recent years, the World Bank has scaled back many of its health programs in Latin America to focus on regions with greater health needs, particularly sub-Saharan Africa. Nevertheless, the World Bank has maintained health strengthening projects in Argentina, Brazil, Nicaragua, and El Salvador and is launching a new project in Panama.[54] It is also analyzing countries to forecast the impact of major events, such as Zika, on economies in affected countries. In February 2016, the World Bank initially estimated that the costs of the Zika outbreak to Latin America would be moderate at $3.5 billion, or roughly 0.06% of regional gross domestic product.[55] Officials have since stated, however, that the impact could be greater, particularly for Caribbean countries dependent on tourism from non-Zika affected countries.[56]

Since the Zika outbreak began in Latin America, the World Bank has made $150 million available for assistance. Most of the funding would be made available by restructuring existing projects to include components focused on Zika or by including Zika-related activities in new projects. Nine countries in Latin America qualify for International Development Association[57] aid based on their low per-capita incomes. These countries can therefore access a "crisis response" window that would provide new money (including grants or credits). As of mid-June 2016, Guyana had asked for $5 million from the crisis response window.[58] El Salvador had allocated $4 million from an existing health project, and Nicaragua had allocated $1 million from an existing project for Zika

[52] WHO, *Zika: Strategic Response Plan*, June 2016.

[53] Those dimensions include the country's capacity to (1) conduct surveillance of the disease, (2) diagnose cases, (3) launch an emergency response, (4) coordinate among various ministries, (5) conduct research, (6) monitor and report on arboviruses, (7) monitor and control complications related to Zika, (8) manage costs, and (9) provide needed health services.

[54] CRS phone interview with World Bank officials, May 12, 2016.

[55] Worid Bank, *The Short-Term Costs of Zika on Latin America and the Caribbean*, February 18, 2016.

[56] Center for Strategic and International Studies (CSIS), "2016 Global Development Forum: Combating Infectious Disease: The Unfolding Threat of Zika," May 19, 2016.

[57] The International Development Assistance countries are Bolivia, Dominica, St. Vincent, Grenada, Guyana, Haiti, Honduras, St. Lucia, and Nicaragua.

[58] Information in the remainder of this section is from CRS communication with World Bank officials, June 16, 2016.

responses. Two states in Brazil had requested $20 million. Another large effort with the federal government of Brazil to address Zika had been put on hold due to the political challenges unfolding in the country.

Inter-American Development Bank

The IDB has an active portfolio of loans and grants for health programs in Latin America totaling roughly $2.7 billion. The largest programs are in Brazil, Mexico, the Dominican Republic, El Salvador, Nicaragua, and Panama. Most IDB programs focus on health system strengthening to enable governments to improve the provision of maternal and child health care and to better address noncommunicable diseases. The IDB is considering a request from the Caribbean Health Agency and a joint proposal from four South American countries to help improve those countries' compliance with International Health Regulations (2005)[59] and assist in planning for health emergencies.

In response to the Zika outbreak, the IDB has offered to reorient up to $180 million of its current portfolio of water, sanitation, and health programs to address Zika.[60] Of the $60 million in health financing made available, the IDB had received requests to reorient $19 million as of mid-May 2016. IDB efforts to address Zika are generally focused on providing family planning in rural areas using community health workers, training primary care workers to detect nervous-system problems, and distributing supplies to prevent mosquito bites. The IDB is also supporting communications campaigns and efforts to increase surveillance capacity and vector control. In addition, the IDB has collaborated with New York University to launch a crowdsourcing project that would enable governments to seek and partner with global health experts for responses to Zika and other infectious disease outbreaks.

U.S. Government

Supplemental Request

In February 2016, President Barack Obama requested almost $1.9 billion in emergency supplemental funding to address the Zika outbreak (**Table A-1**), the bulk of which was requested for the Department of Health and Human Services (HHS) primarily for domestic responses. The Administration requested that $376 million of those funds be used by USAID and the Department of State for international responses and $150 million be used for CDC international responses.

Reprogrammed Funds for USAID and CDC Programs

On April 6, 2016, the Administration announced that it would reprogram $589 million in unspent Ebola funds to address the Zika outbreak. USAID is reprogramming $215 million of that funding to support short-term efforts in Latin America, including a transfer of $78 million to CDC for Zika activities in the region and a $4 million transfer to the Department of State for a contribution to the International Atomic Energy Agency. The largest components of USAID funds are to

[59] The International Health Regulations (2005) requires WHO Member States to (1) notify WHO of any event that may constitute a PHEIC and respond to requests for verification of information regarding such events, (2) follow WHO recommendations concerning appropriate public health responses to the relevant PHEIC, (3) build and maintain core public health capacities for disease surveillance and response, and (4) collaborate with other member states to provide or facilitate the delivery of technical assistance in support of developing and maintaining core public health capacities among all member states. See CRS In Focus IF10022, *The Global Health Security Agenda and International Health Regulations*, by Tiaji Salaam-Blyther.

[60] CRS correspondence with IDB, May 17, 2016.

support vector control programs ($50 million) and to fund a grand challenge to encourage innovative responses to vector control, diagnostics, surveillance, and personal protection ($30 million). By far the largest component of USAID's transfer to CDC is to support surveillance, epidemiology, and public health studies ($44 million). (See **Table A-2**.)

USAID and CDC are determining where to program their activities based on the anticipated numbers of cases in each country (based on experience with dengue and chikungunya) and the anticipated needs of countries in the region. Central America and the Caribbean are top priorities. Unlike the supplemental request, which included $10 million for operating costs, the reprogrammed funds will be implemented with existing staff and resources (although USAID may use program funding to hire some staff).[61] The funds are expected to last for a year at most.[62]

Congressional Action on the Budget Request[63]

In mid-May 2016, both the House and the Senate passed supplemental appropriations measures for Zika response. The House bill, H.R. 5243, would provide $622.1 million in Zika funding and rescind an equal amount of budget authority. The Senate measure (S.Amdt. 3900 to H.R. 2577, the combined FY2017 Military Construction-Veterans Affairs and Transportation-Housing and Urban Development appropriations bills) would provide $1.1 billion in Zika response funding without rescissions. On June 23, 2016, the House agreed to a conference agreement (see H.Rept. 114-640) that would provide $1.1 billion for Zika response, including $175.1 million for State Department and USAID activities. On June 28, 2016, the Senate voted not to invoke cloture on the conference agreement.

Issues to Consider

Congress is considering a range of domestic and international responses to the Zika outbreak. In the global context, as summarized above (see "Congressional Action on the Budget Request"), Members are debating the appropriate response to the outbreak.[64] In the international context, Congress may consider how to balance support for U.S. bilateral and multilateral Zika responses. U.S. foreign assistance to Latin America and the Caribbean has been declining since FY2011, and USAID has been phasing out many global health programs in the region. The Zika outbreak may prompt broader discussions about whether to bolster U.S. global health investments in the Western Hemisphere, including in reproductive health. Discussions about controlling the Zika outbreak may also focus on U.S. support for global pandemic preparedness efforts, as well as research and development for diagnostics, treatments, and prevention measures for certain neglected diseases.

Balancing Support for Multilateral and Bilateral Zika Responses

The bulk of U.S. bilateral and regional health assistance for Latin America and the Caribbean is provided by the State Department and USAID. Since the start of the Obama Administration, State Department and USAID health assistance to the region has declined by roughly 34%. In contrast,

[61] CRS correspondence with USAID, June 22, 2016.

[62] CRS interview with USAID personnel, May 3, 2016.

[63] This section draws from CRS Report R44549, *Supplemental Appropriations for Zika Response: The FY2016 Conference Agreement in Brief*, by Susan B. Epstein and Sarah A. Lister.

[64] Ibid.

U.S. annual assessed contributions to PAHO have increased from $59.1 million in FY2009 to $65.7 million in FY2015. U.S. voluntary and assessed contributions currently represent roughly 37% of the organization's $200 million annual budget.[65] Despite these increases, PAHO has struggled to fund missions that bring experts to the region, which cost between $15,000 and $20,000 per expert. PAHO maintains that those missions, partnerships with NIH and other research entities, and training for health and vector control workers are greatly needed in the region.[66] The U.S. government also provides annually assessed and voluntary contributions to WHO, UNICEF, the World Bank, and the IDB, which have launched Zika responses in the region.

WHO and PAHO have launched a revised plan to support countries in their response to the Zika outbreak (see "WHO and PAHO," above) through 2017. As of mid-June 2016, WHO and PAHO have received $4 million to support what they estimate will cost $122 million overall.[67] The WHO has not reported voluntary contributions from the U.S. government for the plan, although the Administration's February 2016 Zika budget request includes $10 million for the WHO/PAHO response and the Administration reprogrammed $14 million of Ebola funds for voluntary contributions to WHO, PAHO, and UNICEF for Zika activities in April 2016.[68]

Given the relatively small U.S. health investment in the region (as discussed below), Congress may discuss the appropriate mix of funds, if any, to provide for multilateral Zika responses. In a region with relatively deep engagement with multilateral organizations, some would argue for providing increased funds to those entities. Others believe that it is harder to control how multilateral contributions are spent and ensure that related activities align with U.S. priorities.

Health as a Component of U.S. Assistance to Latin America and the Caribbean[69]

Current U.S. policy in Latin America is designed to promote economic and social opportunity, ensure the safety of the region's citizens, strengthen effective democratic institutions, and secure a clean energy future. As part of broader efforts to advance these priorities in the region, USAID and the State Department lead these efforts through a variety of foreign assistance programs. State Department assistance is primarily related to rule of law and security and certain other presidential priorities, whereas USAID focuses primarily on poverty alleviation, democracy and governance, health, and economic development. USAID and State Department assistance in Latin America and the Caribbean has been declining, particularly since FY2011—the period following the release of the 2010 President's Policy Directive on Global Development (PPD-6).[70] Although the directive sought to elevate development as a "core pillar" of American foreign policy, it also directed U.S. agencies to "be more selective about where and in which sectors [they] work."

[65] CRS correspondence with PAHO official, June 10, 2016.

[66] NIH, "PAHO's Dr. Marcos Espinal on Global Partnerships to Fight Zika, Ebola, and Other Diseases," *Global Health Matters*, April 2016; CSIS, "2016 Global Development Forum."

[67] That estimate includes funds needed for a joint response by WH0/PAHO and some 60 partners. WHO, *Zika Strategic Response Plan Revised for July 2016-December 2017*, June 2016.

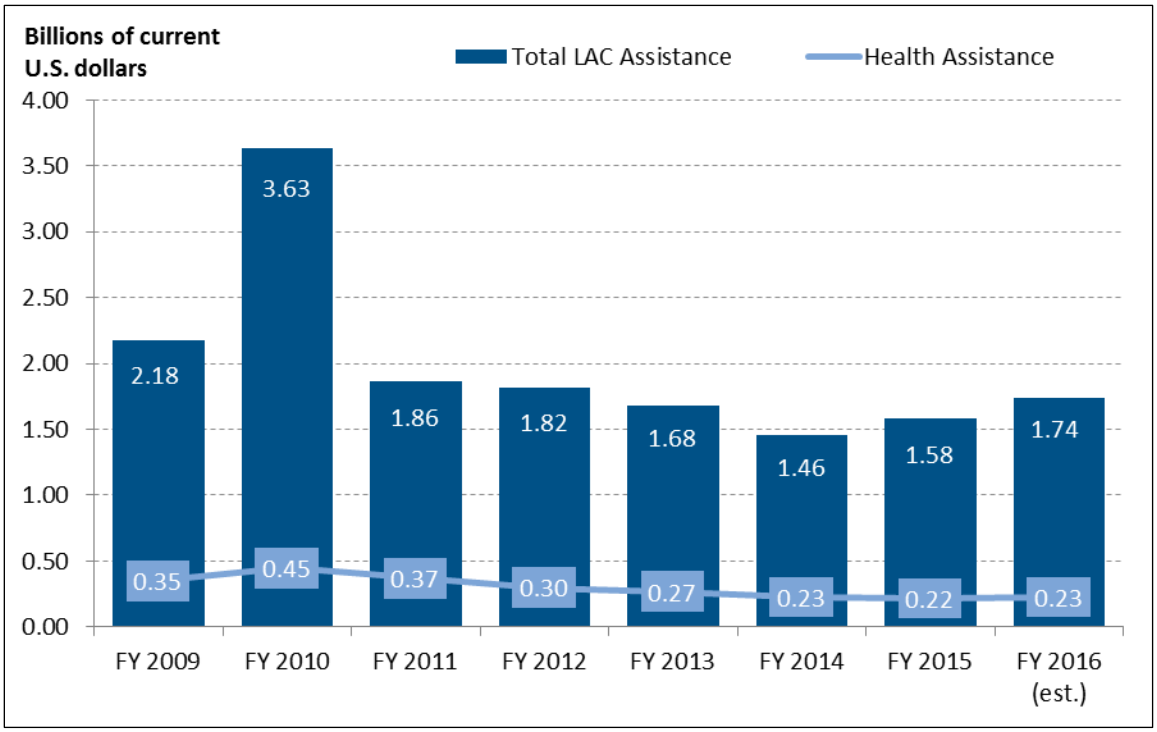
[68] USAID, "Zika Response: Initial Time-Critical Activities," April 6, 2016.

[69] For more information, see CRS Report R44113, *U.S. Foreign Assistance to Latin America and the Caribbean: Recent Trends and FY2016 Appropriations*, by Peter J. Meyer.

[70] See White House, "U.S. Global Development Policy," September 22, 2010.

The PPD-6 prompted USAID to conduct a comprehensive review of its development assistance programs. Following a review of the health sector, USAID determined that many of the countries in the region "had achieved remarkable progress, were far ahead of other presence countries [i.e., those with a USAID mission], and could effectively sustain progress without further USAID assistance."[71] This finding led to a gradual reduction in health funding in the region (**Figure 4**). Health assistance fell from a high of $445.6 million in FY2010 to an estimated $231.3 million in FY2016.

Figure 4. U.S. Assistance to Latin America and the Caribbean: FY2009-FY2016



Source: U.S. Department of State, *Congressional Budget Justification for Foreign Operations*, FY2011-FY2017; Correspondence with USAID Budget Office, June 30, 2016.

Note: The FY2010 total includes $1.1 billion in supplemental appropriations, largely for Haiti in the aftermath of the earthquake. Health funds Include support from the State Department for HIV/AIDS programs funded through the President's Emergency Plan for AIDS Relief (PEPFAR).

[71] CRS correspondence with USAID, June 8, 2016.

USAID continues to support programs related to maternal and child health, reproductive health, and family planning in Guatemala and Haiti, but it has discontinued such programs in all other countries across the region.[72] Policymakers concerned about development in Latin America may consider whether health should once again become a larger component of U.S. assistance programs, as inadequate access to health services can exacerbate poverty and inequality. A recent report by the U.N. Development Program urged governments and donors in the region to focus on addressing exclusion experienced by Afro-descendant and indigenous populations, women who suffer from domestic violence, and rural populations.[73] These issues may be of particular concern in Central America, where the Administration significantly increased development assistance in FY2016 (and in the FY2017 request) but did not include any funds for bilateral health programs in Honduras or El Salvador.

U.S. Global Health Support in Latin America

With support from USAID and other donors, many Latin American countries have made notable progress in improving the delivery of primary health care services—including access to contraception and basic prenatal care—over the past few decades. Since the 1960s, these developments have led to a 41% decline in maternal mortality, a 70% decline in infant mortality, and a drop in fertility rates from six children per family to between two and three children per family.[74]

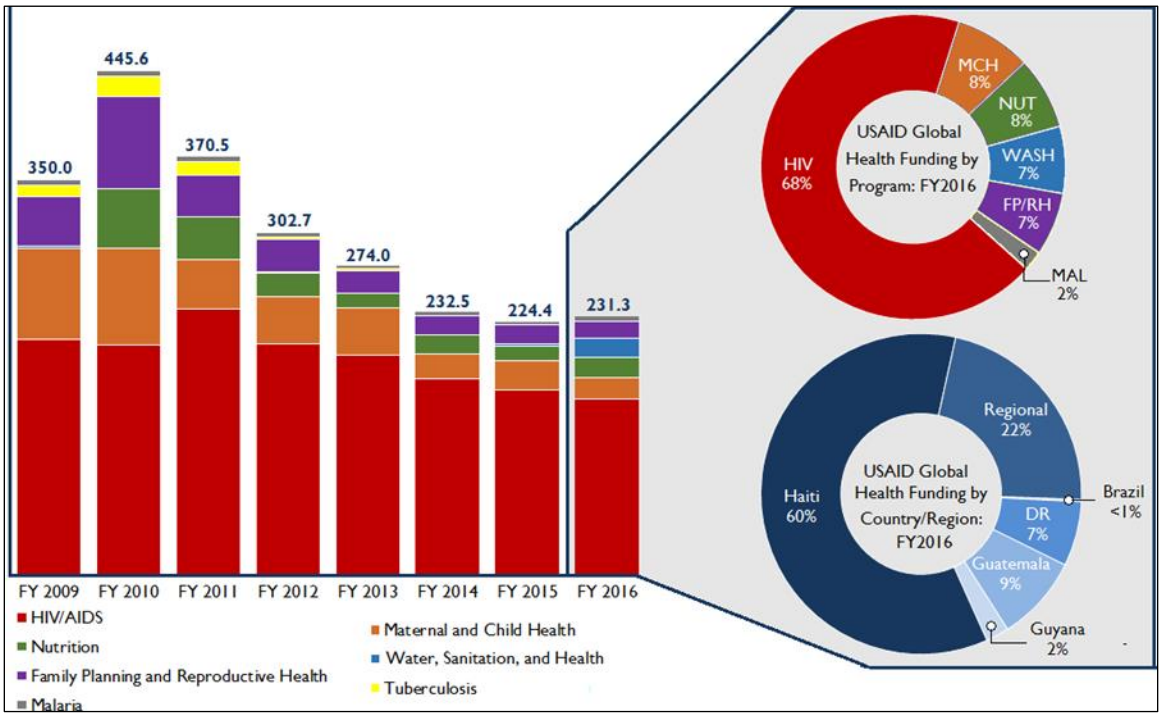
[72] Jane T. Bertrand, *USAID Graduation From Family Planning Assistance: Implications for Latin America*, Population Institute and Tulane University School of Public Health and Tropical Medicine, October 2011; correspondence with USAID, June 8, 2016.

[73] U.N. Development Program, *Multidimensional Progress: Well-Being Beyond Income*, June 2016.

[74] Kimberly Cole, "A USAID Legacy in Latin America: Smaller Families and Better Health," *Frontlines*, July/August 2013.

Figure 5. USAID-Managed Global Health Funding in Latin America and the Caribbean: FY2009-FY2016

(current U.S. $ in millions and percentage)



Source: Created by CRS from correspondence with USAID Budget Office, June 8, 2016.

Notes: FY2009-FY2015 are enacted levels and FY2016 is an estimate. MCH = maternal and child health; NUT = nutrition; WASH = water, sanitation, and hygiene; FP/RH = family planning/reproductive health; MAL = malaria; DR = Dominican Republic; Regional = regional programs. Some HIV/AIDS funding implemented by USAID is provided through a State Department account.

As a result of this progress, USAID global health engagement in the region has been steadily declining (see **Figure 5**). In FY2009, for example, USAID implemented global health programs in 14 countries in the region. By FY2016, USAID global health programs were operating in five countries (Brazil, Dominican Republic, Guatemala, Guyana, and Haiti). In three of those countries (Brazil, Dominican Republic, and Guyana), global health programs focus only on HIV/AIDS.[75] In FY2009, maternal and child health (23%) and reproductive health and family planning programs (13%) together constituted almost 40% of USAID health programs in Latin America. By 2016, maternal and child health (8%) and family planning and reproductive health programs (7%) amounted to 15% of all USAID health spending in the region.

In 2016, health ministers in several countries urged women to consider postponing pregnancy in response to Zika. Delaying or avoiding pregnancy is a problem in some communities where access to affordable and reliable contraception is limited and domestic violence (including spousal rape) is a major problem.[76] Experts estimate that some 56% of pregnancies in Latin America are unplanned, particularly among adolescents in poor communities who often do not

[75] Excludes regional programs in Latin America and the Caribbean that focus on HIV/AIDS.

[76] Sarah Bott et al., *Violence Against Women in Latin America and the Caribbean: A Comparative Analysis of Population-Based Data from 12 Countries*, PAHO, 2013.

have access to sexual education or counseling.[77] Health experts, including WHO Director-General Margaret Chan, have decried this constraint.[78] The WHO/PAHO Zika Strategic Response Plan urges support for reproductive health counseling and services, and pre- and postnatal care to pregnant women who may be affected by Zika and related birth defects.

Some groups have advocated for many countries in Latin America and the Caribbean to legalize abortions for severe microcephaly cases and have urged the United States to bolster investments in family planning and reproductive health services across the region.[79] Others oppose the legalization of abortion and argue that additional resources should be spent on finding effective treatments and vaccines. In February 2016, Pope Francis—an Argentinian who is influential in largely Catholic Latin America—indicated that birth control may be the "lesser evil" compared with allowing babies to be born with microcephaly, though he remained staunchly opposed to abortion.[80]

Pandemic Preparedness

In recent years, a succession of new and reemerging infectious diseases have caused outbreaks and pandemics that have together affected millions of people worldwide: Severe Acute Respiratory Syndrome (2003), Avian Influenza H5N1 (2005), Pandemic Influenza H1N1 (2009), Middle East Respiratory Syndrome coronavirus (2013), Ebola (2014), and Zika (2015). In 2014, former HHS Secretary Kathleen Sebelius and WHO Director-General Margaret Chan announced the Global Health Security Agenda (GHSA), a global effort to accelerate implementation of the International Health Regulations (2005), particularly in resource-poor countries that lack the ability to comply with the regulations.[81] The regulations include measures to strengthen global responses to public health events with potential international impact.

Some analysts have asserted that Zika transmission has exposed weaknesses in Latin American countries' pandemic preparedness.[82] As of 2012, PAHO maintained that only six countries (Brazil, Canada, Colombia, Costa Rica, and the United States) were prepared to handle a pandemic.[83] Through GHSA, the United States has committed to support 30 countries—two of which (Haiti and Peru) are in the Western Hemisphere—and CARICOM.[84]

Congress provided $597 million to CDC through emergency Ebola appropriations for the GHSA. The legislation did not specify where the funds were to be used. In light of the growing disease threats posed by *Aedes* mosquitoes in the Western Hemisphere, policymakers might consider whether to expand U.S. support for GHSA implementation to other countries in Latin America.

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[77] G. Sedgh, S. Singh, and R. Hussain, "Intended and Unintended Pregnancies Worldwide in 2012 and Recent Trends," *Studies in Family Planning*, no. 3 (September 2014), pp. 301-314.

[78] Margaret Chan, address to the 69th World Health Assembly, Geneva, Switzerland, May 23, 2016. See also Woodrow Wilson Center, "How Zika Is Shaping the Sexual and Reproductive Health and Rights Agenda," April 12, 2015.

[79] For current restrictions on U.S. family planning assistance, see CRS Report R41360, *Abortion and Family Planning-Related Provisions in U.S. Foreign Assistance Law and Policy*, by Luisa Blanchfield.

[80] "Full Text of Pope Francis' in-Flight Interview from Mexico to Rome," *Catholic News Agency*, February 18, 2016.

[81] For more information on GHSA, see CRS In Focus IF10022, *The Global Health Security Agenda and International Health Regulations*, by Tiaji Salaam-Blyther.

[82] Victor J. Dzau and Peter Sands, "Beyond the Ebola Battle—Winning the War Against Future Epidemics," *New England Journal of Medicine*, June 2016; Lawrence O. Goslin, "Neglected Dimensions of Global Security: The Global Health Risk Framework Commission," *Journal of the American Medical Association*, vol. 315, no. 12 (April 12, 2016).

[83] PAHO, September 2013.

[84] See the GHSA website at http://www.cdc.gov/globalhealth/security/ghsagenda.htm.

Given entreaties from health experts to bolster pandemic preparedness efforts to minimize the effects of future outbreaks, Congress might consider whether ongoing funding for pandemic preparedness is sufficient. Since FY2014, Congress has been appropriating $72.5 million annually to USAID and an average of $58 million annually to CDC for global health security efforts. The Administration is seeking $72.5 million for USAID and $65.2 million for CDC to implement global health security programs in FY2017.

Research and Development for Neglected Diseases

Since 2015, three disease outbreaks (dengue, chikungunya, and Zika) have spread from Latin America and the Caribbean into the United States, with the latter being only travel associated at the time of this report. These and other diseases lack vaccines to prevent transmission, treatment regimens, and effective vector control measures.

The WHO and other health experts have called for increasing investments in research and development for "neglected tropical diseases" such as dengue and chikungunya, as well as for Zika.[85] A consortium of health experts estimates that the international community would need to double current investments in health research and development for neglected diseases from $3 billion in 2014 to $6 billion by 2020 to meet global health goals.[86]

According to the Global Health Technologies Coalition, the United States accounts for roughly 70% of public investment and 45% of global investment in global health research and development.[87] The United States provides the highest amounts of funding for research and development for 26 of the 30 most neglected diseases. As of 2012, it supported more than half of the global health products in the development pipeline. Since peaking in 2009, however, U.S. funding for global health research and development has fluctuated (**Figure 6**).

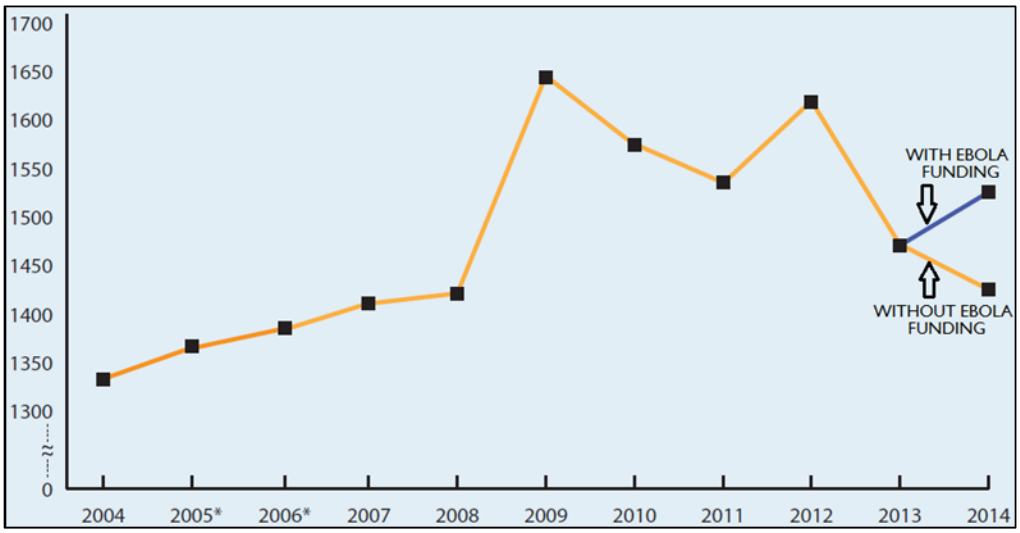
[85] WHO, *Investing to Overcome the Global Impact of Neglected Tropical Diseases: Third WHO Report on Neglected Tropical Diseases*, February 2015; and Helen M. Lazear, Elizabeth M. Stringer, and Aravinda M. de Silva, "The Emerging Zika Virus Epidemic in the Americas: Research Priorities," *Journal of the American Medical Association*, May 10, 2016.

[86] Global Health Technologies Coalition, *Achieving a Bold Vision for Global Health: Policy Solutions to Advance Global Health R&D*, 2016, p. 6.

[87] Ibid.

Figure 6. U.S. Investment in Research and Development for Neglected Diseases

(2014 US$ in millions)



Source: Adapted by CRS from Global Health Technologies Coalition, *Achieving a Bold Vision for Global Health: Policy Solutions to Advance Global Health R&D*, 2016, p. 6.

Notes: Estimates. Data sources: Global Health Technologies Coalition, "Saving Lives and Creating Impact: Why Investing in Global Health Research Works," *Policy Cures*; 2012; and M. Moran et al., "Neglected Disease Research and Development: The Ebola Effect," *G-FINDER, Policy Cures*, 2015.

In April 2016, Congress enacted P.L. 114-146, Adding Zika Virus to the FDA Priority Review Voucher Program Act, to add the Zika virus to the list of tropical diseases eligible for the Food and Drug Administration's (FDA) Priority Review Voucher program, which allows companies to fast-track a product through the FDA regulatory process. It is unclear what effect this action will have on the development of products to control, treat, and prevent Zika, although several U.S. government agencies are already supporting development of vaccines and treatments for the Zika virus.[88] DOD is conducting preclinical research on a Zika vaccine candidate and plans to start human testing by the end of 2016. The Biomedical Advanced Research Development Authority (BARDA) within HHS has received a number of proposals to develop new Zika vaccines using vaccine platforms that could also be used for other emerging infectious disease threats. BARDA, NIH, and DOD are collaborating to support the development of a vaccine at DOD's Walter Reed Army Institute of Research.

Health experts argue that the Zika outbreak highlights the need to increase research not only for the treatment and prevention of human Zika infections but also for the development of effective vector control measures. At the 69th World Health Assembly, WHO Director-General Chan asserted that "the spread of Zika, the resurgence of dengue, and the emerging threat from chikungunya are the price being paid for a massive policy failure that dropped the ball on mosquito control in the 1970s."[89] Inappropriate and inconsistent use of insecticides has led to insecticide resistance and the growth of *Aedes* populations across the Western Hemisphere.[90] This

[88] See, for example, NIH, "NIAID Research Approach to Zika Virus," https://www.niaid.nih.gov/topics/zika/ResearchApproach/Pages/default.aspx; and DOD, "Walter Reed Scientists Test Zika Vaccine Candidate," June 10, 2016.

[89] Margaret Chan, "Address to the Sixty-Ninth World Health Assembly," May 23, 2016.

[90] Ildefonso Fernandez-Salas, "Historical Inability to Control *Aedes* Aegypti as a Main Contributor of Fast Dispersal of

phenomenon has prompted some to advocate for increased U.S. investments in vector control in the region. Brazil has become the first country in the world to approve the large-scale use of genetically modified mosquitoes in vector control programs, and the FDA is reviewing a request to conduct trials of the technology in the United States.[91]

The Zika budget request includes $100 million for USAID to incentivize the development of Zika vaccines, diagnostics, and vector control measures. It is unclear whether these funds will be sufficient to encourage market development of these products.

Possible Future Actions

The future of the Zika supplemental funding request is uncertain at this time due to a number of controversial measures that are in the conference report. Some observers are concerned that there may not be enough time for the House and Senate to resume negotiations to reconcile their responses to the Zika outbreak before they adjourn in July.[92] In the meantime, U.S. agencies are using reprogrammed funds to complement current efforts by Latin American governments, PAHO, the private sector, and other donors. The size and scope of U.S.-funded initiatives to address Zika in Latin America and the Caribbean is also uncertain.

Chikungunya Outbreaks in Latin America," *Antiviral Research*, vol. 124 (October 27, 2015).

[91] For more information on genetically modified mosquitoes, see CRS In Focus IF10401, *Genetically Engineered Mosquitoes: A Vector Control Technology for Reducing Zika Virus Transmission*, by Tadlock Cowan.

[92] Kelsey Snell, "Zika Funding Bill Blocked in the Senate," *Washington Post*, June 28, 2016.

Appendix A. Supporting Documentation

Table A-1. Zika Funding Request

Department/Agency	Key Activities	Funding Level
Department of Health and Human Services (HHS)		**$1.509 billion**
U.S. Centers for Disease Control and Prevention (CDC)	• Support domestic Zika responses • Enhance domestic mosquito control programs • Establish domestic rapid response teams • Improve domestic laboratory and surveillance capacity • Expand the domestic CDC Pregnancy Risk Assessment Monitoring System, improve domestic Guillain-Barré syndrome tracking, and ensure the ability of domestic birth defect registries to detect Zika-related risks • Increase research linking Zika virus infections and microcephaly • Enhance international capacity for Zika surveillance, expand the Field Epidemiology Training Program (FETP), laboratory testing, health care provider training, and vector surveillance and control in countries at highest risk of Zika virus outbreaks • Improve diagnostics for Zika virus and support developments for vector control	$743 million, of which $150 million is for international efforts
Centers for Medicare and Medicaid Services	• Temporary one-year increase in Puerto Rico's Medicaid federal medical assistance percentage to support health services for pregnant women at risk of infection or diagnosed with Zika and for children with microcephaly and other related health costs	$250 million
Vaccine Research and Diagnostic Development and Procurement	• Research, rapid advanced development and commercialization of new vaccines and diagnostic tests for Zika virus	$200 million
	• Establish an Urgent and Emerging Threat Fund to address Zika and other outbreaks • Support Puerto Rico's community health centers in preventing, screening, and treating Zika, expand home visiting services for low-income pregnant women at risk of Zika infection, and provide targeted maternal and child health services	$210 million
U.S. Agency for International Development (USAID)	• Implement vector management activities in countries at risk of Zika infection • Stimulate private sector research and development of vaccines, diagnostics, and vector control innovations • Support training of health care workers in affected countries • Support for pregnant women's health	**$335 million**

Department/Agency	Key Activities	Funding Level
	• Establish Zika education campaigns • Issue a Global Health Security Grand Challenge calling for innovative diagnostics, vector control, personal protection, community engagement, and surveillance for Zika and other infectious diseases • Provide flexibility in the use of remaining USAID Ebola funds	
U.S. Department of State	• Support for U.S. citizens and State Department employees in affected countries, public diplomacy, communications, and other operations activities • Support World Health Organization and Pan American Health Organization efforts to minimize Zika threats in affected countries	**$41 million**

Source: White House, "Preparing for and Responding to the Zika Virus at Home and Abroad," February 8, 2016.

Notes: The FETP is CDC's program to train epidemiologists worldwide. For more information, see http://www.cdc.gov/globalhealth/healthprotection/fetp/index.htm.

Table A-2. Funding Redirected from USAID Ebola Emergency Operations for International Zika Responses

(current US$ in millions)

Department/Agency	Key Activities	Funding Level
USAID/U.S. Department of State	• Social and behavioral change communications	$17.0
	• Vector management	$50.0
	• Grand challenge for development	$30.0
	• Market incentives	$10.0
	• Maternal and child health interventions and service delivery	$17.0
	• Support for international organizations (PAHO, UNICEF)	$13.0
USAID Total		*$137.0*
CDC	• Implement Vector Management and Control	$7.0
	• Maternal and Child Health Interventions	$1.0
	• Innovations	$5.0
	• Surveillance, Epidemiology, and Studies	$44.0
	• Laboratory Capacity and Equipment	$15.0
	• Management and Coordination of Response	$6.0
CDC Total		*$78.0*

Source: USAID Congressional Notification, "Zika Response: Initial Time-Critical Activities," April 6, 2016.

Appendix B. Online Resources on Zika Virus

Organization	Source Title	Document/Link
Centers for Disease Control and Prevention (CDC)	Zika Travel Information	http://wwwnc.cdc.gov/travel/page/zika-travel-information
CDC	Zika Virus Index	http://www.cdc.gov/zika/index.html
Pan American Health Organization (PAHO)	Zika Resources for Health Authorities	http://www.paho.org/hq/index.php?option=com_content&view=article&id=11601&Itemid=41694&lang=en
PAHO	Zika Resources for General Public	http://www.paho.org/hq/index.php?option=com_content&view=article&id=11602&Itemid=41695&lang=en
PAHO	Epidemiological Alerts and Updates	http://www.paho.org/hq/index.php?option=com_content&view=article&id=1239&Itemid=2291&lang=en
World Bank	Zika Virus Fact Sheet	http://www.worldbank.org/en/topic/health/brief/world-bank-group-and-zika-fact-sheet
UNICEF, WHO, PAHO, IFRC	Risk communication and community engagement for Zika virus prevention and control	http://www.unicef.org/cbsc/files/Zika_Virus_Prevention_and_Control_UNICEF_English.pdf
United Nations Population Fund (UNFPA)	Zika virus: Frequently asked questions	http://www.unfpa.org/resources/zika-virus-frequently-asked-questions
UNFPA	UNFPA on the Zika Virus Outbreak	http://www.unfpa.org/press/unfpa-zika-virus-outbreak
World Health Organization (WHO)	Zika Strategic Response Framework & Joint Operations Plan	http://apps.who.int/iris/bitstream/10665/204420/1/ZikaResponseFramework_JanJun16_eng.pdf?ua=1
WHO	Zika Virus Situation Reports	http://who.int/emergencies/zika-virus/situation-report/en/

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