Zika virus spreads in Puerto Rico and Florida

Julio Patron, David Brown 12 September 2016

The Zika virus has continued to spread in the United States and its territories throughout the summer months, leading to a health crisis with long-term impacts. Over 18,000 people have tested positive for the disease, including 1,750 pregnant women. Zika can cause a range of neurological problems and particularly targets fetal brain development, leading to birth defects, most notably microcephaly, the small development of the brain.

On Friday, Thomas Frieden, the director of the Centers for Disease Control and Prevention announced that they "are now essentially out of money," and that Americans are "about to see a bunch of kids born with microcephaly." The CDC first requested funding in February, but Congress has yet to pass any funding measure.

The epidemic has steadily unfolded in the US despite constant warnings from health officials that preventive measures were necessary. In May 2015 the Zika epidemic in Brazil that has now spread to the US was first identified. In December 2015 the first case of local Zika transmission in the US territory of Puerto Rico was confirmed. In February 2016 the World Health Organization declared the explosive spread of the virus throughout the Americas a public health emergency of international concern.

The similarity of Zika to other mosquito-borne illnesses, like dengue and chikungunya, led a variety of experts from the National Institutes of Health, the National School of Tropical Medicine, the CDC and others to warn of Zika's impending spread throughout Puerto Rico and onto the US mainland. Despite these warnings, the US Congress went into recess in July without approving any funding.

On August 12, the US government declared a public health emergency in Puerto Rico due to the rapid spread of the virus, which would allow the access of emergency funds. Close to 50 pregnant women are

testing positive for the disease daily, and the CDC estimates that by the end of this year, 20 to 25 percent, or 875,000 of the Puerto Rican population will have contracted the virus.

There are over a thousand new Zika cases being reported each week, and the total reported in Puerto Rico so far is 15,541, according to the CDC. Because most of those infected experience no symptoms, the number of people infected is likely much larger.

Unwilling and unable to address the poor health care, widespread poverty and antiquated infrastructure that forms the social basis of the Zika outbreak, government officials and agencies have focused on posturing over petty squabbles and half-measures.

The governor of Puerto Rica, Alejandro Padilla, filed a federal lawsuit July 21 against the CDC plan to use aerial spraying of the insecticide Naled across the island in order to slow the spread of Zika. The CDC has since backed down from the proposal, but has responded to the lawsuit, saying that Naled has been used in the United States for years and is currently being sprayed in Florida.

At sufficient concentrations, Naled is known to cause a wide range of issues, from nausea to paralysis, and is potentially deadly. It can also lead to neurological disorders in unborn babies. Although the concentrations used in aerial spraying are below those known to cause health problems, it can seriously impact other useful insects like bees. Due to its potential risks, Naled has been banned by the European Union.

Zika is primarily transmitted by the *Aedes aegypti* mosquito. The *Aedes* mosquito is the most common type in the US and throughout the world and spreads particularly well in poor urban environments. To breed, it only requires small puddles of water like those readily found anywhere without regular trash collection or piped water. Basic infrastructure—such as indoor plumbing, air conditioned buildings, window screens

and clean streets—greatly reduces the ability of the mosquito to bite multiple people, spreading the disease.

The Zika virus targets the nervous system and its impact on fetal development can be catastrophic. It is known to cause microcephaly, a rare birth defect that causes babies to be born with abnormally small heads and life-threatening brain damage. If the mother contracts the virus at any point during her pregnancy, it can be carried over to the infant. The estimated cost to care for a baby diagnosed with microcephaly ranges from \$1 million to \$10 million.

It is unknown at what point in pregnancy and childhood the Zika virus affects brain development. Initial research on the Brazilian epidemic shows that affected infants born with a normal-sized head, generally those infected later in the pregnancy, can suffer from a host of difficulties, including abnormal eye development and hearing loss. The full impact of Congenital Zika Syndrome will only be discovered as doctors study those affected as they grow.

Although most adults who contract Zika show no significant symptoms, it can cause Guillain-Barré syndrome, an uncommon disorder that causes the body's immune system to attack its own nerve cells. It can cause paralysis and death. There is currently no vaccine or cure for Zika.

Brazil is the epicenter of the current Zika epidemic, with 78,421 confirmed cases, and 196,000 suspected of having the virus. Poor access to health care and the lack of a simple test for Zika make the full extent of the epidemic difficult to know, but the number of infants with congenital defects has doubled since the outbreak. The outbreak began in the poverty stricken northeast region of Brazil. Birth malformations were at about 40 per 100,000 until November 2015. The number then jumped to 170 per 100,000 births, four times higher in the area.

The conditions of poverty that led to Zika's spread through Brazil are increasingly found within the United States. Florida, the only US state with local transmission of the disease, has an official poverty rate of 16.6 percent. Over 10 percent of the state's children live in deep poverty, defined as less than half of the official poverty rate. In Puerto Rico, 45 percent of the population live below the poverty line, and the territory's health care system has faced massive cuts due to an ongoing \$70 billion debt crisis.



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