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Better surveillance to protect mothers and infants from Zika

Suzanne M Gilboa, Christopher J Gregory, Margaret A Honein

Division of Congenital and Developmental Disorders, National Center on Birth Defects and Developmental Disabilities, US Centers for Disease Control and Prevention, Atlanta, GA 30341, USA (SMG, MAH); and Division of Vector-Borne Diseases, National Center for Emerging and Zoonotic Infectious Diseases, US Centers for Disease Control and Prevention, Fort Collins, CO, USA (CJG)

In *The Lancet Infectious Diseases*, Sarah Hill and colleagues¹ report their multi-component investigation of the Zika virus outbreak in Angola. The authors make a compelling argument that the Asian lineage of Zika virus caused the outbreak, recognition of which was substantially delayed. Phylogenetic analyses of the viral genome suggest that isolates from Angola were closely related to Zika viruses circulating in Brazil, and that the virus was introduced to Angola between July, 2015, and June, 2016. They estimated that Zika virus had been circulating in Angola for 17–28 months, and reported that the virus could have been circulating for up to 18 months before local detection in December, 2016 (local transmission of Zika virus was reported to WHO in January, 2017).^{1,2} The timing of the birth of the first infant with suspected microcephaly that was potentially attributable to Zika virus infection in January, 2017, provides additional evidence that the virus was probably circulating in early 2016.^{3,4} Such delays in recognition of Zika virus are not unusual in countries with little surveillance of arboviral diseases or birth defects. For Zika virus, the absence of adequate surveillance could lead to severe consequences—specifically, infants with congenital Zika syndrome.

Surveillance of transmission of Zika virus is difficult because most cases are mild or asymptomatic; clinical signs and symptoms, when present, are similar to those of other common infections; and there is no reliable diagnostic test outside the 1–2 weeks after initial infection.⁵ Careful genomic epidemiological studies in the WHO Region of the Americas have shown probable prolonged local transmission and multiple introductions of Zika virus before detection even in areas with well established arboviral surveillance systems,^{6,7} emphasising the challenge facing countries with less developed surveillance, particularly those with close travel and trade links with countries where Zika virus or other arboviruses are circulating.

The 2015–16 Zika virus outbreak in the Americas also showed the devastating fetal effects associated with the Asian lineage of Zika virus. Animal studies⁸ suggest that the African lineage, which was identified in Uganda more than 70 years ago and has probably been

sgilboa@cdc.gov.

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circulating across the continent since, could be equally or more harmful to the developing fetus. However, the absence of surveillance for both the virus and adverse pregnancy outcomes in most African countries means that potential effects of Zika virus infection could have gone undetected for decades.⁸ A 2006 March of Dimes report⁹ on the global burden of birth defects estimated that Angola had one of the highest prevalences of birth defects worldwide. Because there is no surveillance infrastructure for birth and few health-care personnel trained in public health surveillance, affected babies in Angola are unlikely to be detected or to receive appropriate care.

To improve capacity for surveillance of birth defects, the US Centers for Disease Control and Prevention (CDC), the International Clearinghouse for Birth Defects Surveillance and Research, ministries of health, and other relevant country-specific government entities have collaborated on in-country and regional training. This training has focused on increasing awareness of the importance of birth defects surveillance; the establishment of a programme to collect complete, accurate, and timely data; and ensuring referral to services to improve quality of life for children affected by birth defects. Training materials, including a surveillance manual and an atlas of selected congenital anomalies, to help countries to launch surveillance programmes and monitor birth defects in low-income and middle-income countries are publicly available.

Development, implementation, and maintenance of high-quality surveillance of birth defects and vector-borne disease are difficult and costly, but can aid in the timely detection of new and emerging threats to mothers and babies, as proven by experience with Zika virus. Both the African and Asian lineage of the virus could have been causing harm undetected for the past 50 years. Some settings in the Americas had surveillance infrastructures that were well positioned to identify and respond to the 2015–16 outbreak, thereby facilitating rapid understanding of the effect of the Asian lineage on the health of mothers and babies. Knowledge gleaned from the outbreak in the Americas has informed care and clinical management of pregnant women and children, and guidance for travellers. Both the US CDC and WHO advise counselling—with careful consideration of the risks, benefits, and the individual travel situation—for any pregnant women considering travel to an area where there is a risk of Zika virus infection.^{10,11} Both organisations also recommend that pregnant women avoid travel to areas with Zika outbreaks and recommend caution about or avoidance of travel to areas with current or past Zika virus transmission.^{10,11} Transmission of Zika virus in these settings is difficult to predict in the absence of robust surveillance and testing. By the time an outbreak is detected, pregnant women and their developing babies might have already have been exposed to Zika virus, as shown by the experience documented in Angola.

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For the **International Clearinghouse for Birth Defects Surveillance and Research** see margin link to www.icbdsr.org

For **training materials** see http://www.who.int/nutrition/publications/birthdefects_manual/en/

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