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Better surveillance to protect mothers and infants from Zika

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In *The Lancet Infectious Diseases*, Sarah Hill and colleagues[1] 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 studies[8] suggest that the African lineage, which was identified in Uganda more than 70 years ago and has probably been 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 report[9] 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

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/

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 these 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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Revisiting gonorrhoea transmission

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See Personal View pages e360 and e367

In two Personal Views in *The Lancet Infectious Diseases*, Christopher Fairley and colleagues[1] and Edward Hook and Kyle Bernstein[2] discuss the pros and cons relating to the proposal that oropharyngeal infection is an important factor in the transmission of *Neisseria gonorrhoeae* between men who have sex with men.

Fairley and colleagues argue that if gonorrhoea was thought of as a new sexually transmitted infection, and hence transmission was modelled on the basis of data alone as opposed to including preconceptions about the mechanism of transmission, then the oropharynx would seem to have an important role. If correct, this route of transmission potentially undermines existing approaches to transmission interruption (ie, via use of condoms). To explore the oropharyngeal hypothesis, Fairley and colleagues create models that reflect their proposal and the conventional view; arguing that the data better fit their proposal. Importantly, this hypothesis is limited to urban populations whom have ready access to health care.

Hook and Bernstein counter that assumptions related to the presence or absence of symptoms of gonococcal infection do not seem to be borne out by the data, leading to erroneous assumptions in the modelling.