Journal of Infection and Public Health (2016) 9, 240—250

http://www.elsevier.com/locate/jiph

REVIEW

Deciphering emerging Zika and dengue viral epidemics: Implications for global maternal—child health burden

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Received 18 February 2016; accepted 20 February 2016

KEYWORDS
Zika virus;
Epidemics;
Health;
Preparedness;
Surveillance;
Maternal—child

Summary Since its discovery in 1947 in Uganda and control and eradication efforts have aimed at its vectors (*Aedes* mosquitoes) in Latin America in the 1950s, an absolute neglect of Zika programs and interventions has been documented in *Aedes* endemic and epidemic-prone countries. The current unprecedented Zika viral epidemics and rapid spread in the Western hemisphere pose a substantial global threat, with associated anxiety and consequences. The lack of safe and effective drugs and vaccines against Zika or dengue epidemics further buttresses the realization from the West Africa Ebola outbreak that most emerging disease-prone countries are still poorly prepared for an emergency response. This paper examines knowledge gaps in both emerging and neglected arthropod-borne flavivirus infectious diseases associated with poverty and their implications for fostering local, national and regional emerging disease preparedness, effective and robust surveillance—response systems, sustained control and eventual elimination. Strengthening the regional and Global Health Flavivirus Surveillance-Response Network (GHFV-SRN) with other models of socio-economic, climatic, environmental and ecological mitigation and

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http://dx.doi.org/10.1016/j.jiph.2016.02.005

adaptation strategies will be necessary to improve evidence-based national and global maternal—child health agenda and action plans.

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Introduction

The unprecedented and emerging Zika epidemic is a public health threat of international concern in the Western hemisphere that is spreading quickly and causing havoc. More than two million people have been affected to date, with multiple health and socio-economic consequences. This infectious disease of poverty was first discovered in Uganda in 1947; only 15 cases were documented prior to 2007, and the disease remained in a state of dormancy until now [1]. It has been identified in more than 20 countries in South and Central America, the Caribbean, Asia-Pacific and Africa and some Pacific islands (Fiji, Vanuatu, Micronesia) have also reported sporadic outbreaks [2—4]. Arbovirus disease epidemics have the potential to worsen the global maternal—child health burden in most vector-borne disease-prone countries [5] (Fig. 1).

Zika is caused by an arthropod-borne virus ''arbovirus'' transmitted primarily by *Aedes* mosquito (*Aedes aegypti* and *Aedes albopictus*) bite. Zika is also part of the flavivirus family that also includes dengue, West Nile and yellow fever. Zika virus (ZIKV) can be transmitted through blood and other bodily fluids such as semen during sexual intercourse or mother-to-fetus transmission throughout pregnancy [2]. ZIKV disease outbreaks have been linked with pregnancy syndrome, newborn and child defects and premature deaths [1,2]. Colombia has recoded 13,500 suspected cases and predicts 600,000 cases by the end of 2016 with significant social, health and economic impacts. In comparison, Brazil reported 4000 cases of fetal microcephaly during pregnancy yet had only 150 cases total in 2015 and 2014, respectively. In addition, of the 25,165 infected cases, more than 3177 pregnant women have been documented with the ZIKV in Colombia [6,7]. There is an urgent need for innovative approaches and tools for early detection and rapid confirmation of ZIKV-linked microcephaly and early warning systems to provide timely evidence-based information to guide decision making policies and strategies including pre- and ante-natal counseling and strict abortion measures. We also need new methods for managing climate change, environmental and ecological systems in hospital and maternity settings and hygiene and sanitation efforts to interrupt any potential sources of transmission.