

Status of Zika Virus Circulation in CARPHA Member States

August 2018

Background

Zika Virus (ZIKV) is a Flavivirus spread by the bite of mosquitoes in the *Aedes* genus. ZIKV has been responsible for recent epidemics in Micronesia¹ in 2007, French Polynesia in 2013² and the Americas from 2015 to 2016, affecting all CARPHA Member States (CMS) except Bermuda. During the course of the outbreak in the Americas, increased rates of microcephalic births and Guillain Barré Syndrome (GBS) cases were noted in populations where ZIKV outbreaks had been experienced over the preceding several months. In February 2016, the World Health Organization (WHO) declared a Public Health Event of International Concern (PHEIC)³ in relation to the emergence of microcephaly and other neurological anomalies in newborn infants of mothers infected with ZIKV.

Since the 2015-2016 epidemic, WHO has classified countries of the world into 4 categories⁴, according to their risk of ZIKV transmission. In the current classification scheme, twenty-one (21) of the 26 CMS have been placed into Category 1: "Area(s) with new introduction of Zika virus since 2015 or area(s) where the virus has been re-introduced, with ongoing transmission."

Surveillance and laboratory data submitted to CARPHA from 2016 to present, however, indicate that the circulation of ZIKV in the Region has been interrupted. This document seeks to demonstrate the interruption of ZIKV transmission in the Region.

Methods

The Caribbean Public Health Agency (CARPHA), conducted a comprehensive review of all available surveillance and laboratory information pertaining to ZIKV confirmations arising in CARPHA Member States (CMS):

- Data on internal ZIKV confirmations were extracted from CARPHA's Laboratory Information System (LabIS)
- Data on travel-associated cases, arising from travel to CMS, were requested and received from the United States Centers for Disease Control and Prevention (USCDC); the European Centres for Disease Control (ECDC); and the Public Health Agency of Canada (PHAC)
- CMS were surveyed to ascertain the status of sample collection and testing for ZIKV over the 12-month period preceding the survey

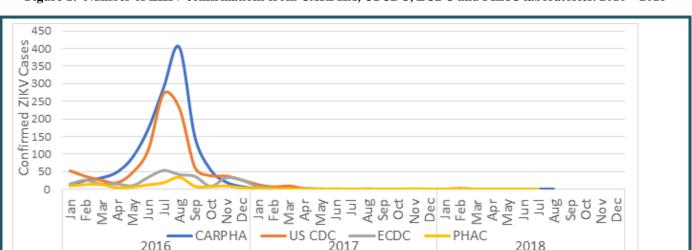


Figure 1: Number of ZIKV confirmations from CARPHA, USCDC, ECDC and PHAC laboratories. 2016 - 2018

Findings

In 2016 CAPRHA confirmed 1,299 ZIKV cases, with peak detection in August and a rapid decline thereafter. Seven (7) cases of ZIKV were confirmed by the CARPHA laboratory in 2017, with the last confirmation occurring in March of that year. No cases have been detected by the CARPHA laboratory for 2018, to date. Data from USCDC, ECDC and PHAC showed very similar patterns, with imported cases from CMS peaking in summer of 2016 and falling rapidly afterward, largely disappearing after early 2017. Survey data from CMS indicated that ZIKV sample collection and submission to CARPHA was still ongoing, albeit at smaller volumes, in the absence of large numbers of cases with fever, rash and other viral symptoms presenting to their health systems for care.

Discussion

Data collected by CARPHA and by three (3) international public health agencies all present a synoptic picture of interrupted transmission of ZIKV in the Region at this time. This pattern matches historical experience with Dengue Virus (DENV) and Chikungunya Virus (CHIKV) infections, in terms of an explosive outbreak followed by the virtual disappearance of cases after the initial epidemic. Descriptive and predictive models of epidemics in the Americas⁵ support this pattern of disease occurrence for arboviral pathogens. These models suggest that interruptions in transmission could last up to 10 years before population dynamics support sustained transmission once more. This prediction also mirrors historical experience with DENV, in the Caribbean, in which waves of a given DENV serotype were seen to occur with periodicities of 8 to 10 years; a pattern that has also long been noted in other parts of the world⁶.



Conclusion and Recommendations

Epidemiological evidence from multiple surveillance systems points to the cessation of ZIKV circulation in the Caribbean region at this time. The risk of ZIKV transmission in the Region is currently low. Risk to residents and visitors is deemed low, although usual precautions apply to avoid mosquitos biting and breeding. CARPHA Member States currently meet WHO criteria for re-classification to Category 3: "Area(s) with interrupted transmission, but with potential for future transmission" and should be re-assigned to this category to avoid potential unwanted impacts on tourism and economic activity, which are not in keeping with the spirit of the International Health Regulations (IHR).

References

1 Duffy MR, Chen T, Hancock W, Thane; et al. (11 June 2009). **Zika Virus Outbreak on Yap Island, Federated States of Micronesia**. NEJM **360**(24): 2536 2543. doi:10.1056/NEJMoa0805715. ISSN 0028-4793. PMID 19516034

² S. Cauchemez, M. Besnard, P. Bompard, T. Dub, P. Guillemette-Artur, D. Eyrolle-Guignot, H. Salje, M. D. Van Kerkhove, V. Abadie, C. Garel, A. Fontanet, H. P. Mallet, **Association between Zika virus and microcephaly in French Polynesia**, **2013-15: A retrospective study**. *Lancet* **387**, 2125–2132 (2016). Medline doi:10.1016/S0140-6736(16)00651-6.

³ World Health Organization, "WHO Director-General summarizes the outcome of the Emergency Committee regarding clusters of microcephaly and Guillain-Barré syndrome" (WHO, Geneva, 2016); Retrieved from: http://bit.ly/HealthEmergency.

⁴World Health Organisation. **ZIKA VIRUS (ZIKV) CLASSIFICATION TABLE (DATA AS OF 15 FEBRUARY 2018)** Retrieved from http://apps.who.int/iris/bitstream/10665/260419/1/zika-classification-15Feb18-eng.pdf?ua=1

⁵ N. M. Ferguson *et al*. **Countering the Zika epidemic in Latin America** *Science* 10.1126/science.aag0219 (2016)

⁶Nisalak A, Endy TP, Nimmannitya S, Kalayanarooj S, Thisayakorn U, Scott RM, Burke DS, Hoke CH, Innis BL, Vaughn DW. **Serotype-specific dengue virus circulation and dengue disease in Bangkok, Thailand from 1973 to 1999.** Am. J. Trop. Med. Hyg., 68(2), 2003, pp. 191–202

Contributors:

Dr. Avery Hinds, Dr. Virginia Asin-Oostburg, Dr. C. James Hospedales, Dr. Gabriel Gonzalez Escobar and Dr. Rosmond Adams.