RSIS S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
Nanyang Technological University

RSIS COMMENTARY

www.rsis.edu.sg No. 029 – 5 February 2016

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Zika Risk Governance and Climate Change

By Jonatan A. Lassa

Synopsis

WHO has declared the Zika outbreak as a global public health emergency. While uncertainty on the linkage between Zika and microcephaly remains, it is time to understand the potential formation of future epidemics under climate change and how governance plays an important role.

Commentary

ZIKA HAS been declared a global public health emergency by the World Health Organisation (WHO). The global community seems to be caught off-guard. Are we ready to roll back this new challenge to humankind that stems from the changing global climate?

The WHO declaration is justified, amid knowledge and data uncertainty on Zika, with the goal being to bring worldwide attention to the problem and quickly establish organised responses and resources to contain the epidemic from spreading.

What is Zika?

Zika is derived from the Zika forest of Uganda, first found in 1947. Experts suspect that the Aedes mosquitos became the host after sucking the blood of monkeys in Zika forest. Such model of disease transmission has invited greater attention in zoonitic studies due to the significant increase in human–animal interaction today.

This increased human-animal interaction may have led to the emergence of zoonitic diseases - those can be passed between animals and humans - including Ebola that struck Africa in 2014. The dynamic of such interaction is also mediated by vector-

related phenomenon such as mosquitos. Aedes mosquitoes transmit known viruses such as dengue, chikungunya and now Zika.

Zika can cause symptoms such as mild fever, headaches, joint pain. The coincidence of the Zika virus outbreak and the sudden rise in cases of microcephaly – abnormal smallness of the heads - in recent months have led to the possible link between Zika and microcephaly. There was a 2000 per cent increase in birth defects with babies born with smaller heads compared to last year.

The United States' Centres for Disease Control and Prevention (CDC) make it clear that until more is known, extra precautionary measures should be taken to protect the most vulnerable groups especially pregnant women.

Mosquitos and Climate

Online, social and visual media are flooded with information that link Zika with Climate Change. However, even without climate change, mosquitos and vectors in general are sensitive to climatic variation. Escalation of the transmission of dengue often occurs during the wettest months (wet season in the tropics) of the year. The population density of such mosquitos can increase up to nine times higher than the normal months according to some reports.

Scientists in China have recently shown that the dengue incidences in Guangzhou have been positively correlated with temperature, humidity and rainfall. After stormy days with extreme rainfall, high humidity and water inundation often generate mosquito breeding sites in Taiwan. In Indonesia, it is well known that disease and hospitalisation incidents are likely to increase with dramatic changes in temperature, relative humidity and precipitation. Warming and wetter conditions may increase waterborne and vector-borne diseases.

Therefore, it is well known that climate variation and change may bring indirect impacts on health by modifying both natural and built environment that favour disease carrying mosquitoes. Climate change may trigger drier drought and wetter rainy seasons. The former often can trigger poorer families in developing countries to stock water inside their house, thus inviting mosquitos to breed. While the later can lead to create favourable conditions for mosquito breeding as well.

Composite Strategies Needed

The good news is that Aedes mosquitos are not new to Asia and the Pacific. Statistics suggest that there are about 390 million dengue cases every year in the planet. Roughly 25 per cent of dengue often manifests with symptoms and 75 per cent of the cases occurs in the Asia-Pacific region.

In fact, globally, there are more than 120 countries known to be dengue endemic. Since Aedes mosquitos are also the host of Zika, Asia and the Pacific are not immune to Zika. In fact these regions have been recently attacked and re-attacked by Zika. However, such an epidemic barely make international news as we have seen in Brazil today.

Adaptation to the risk of Aedes relies on a control programme to reduce the mosquito population before the onset of the wet seasons. Existing innovation and success in malaria and dengue control and prevention in Asia can be capitalised to help governments and communities deal with Zika prevention.

Vector control strategies will need to be planned and managed astutely to systematically reduce mosquito populations. It is quite clear already that elevated dengue and malaria incidence are associated with changing temperature, rainfall and relative humidity. But blaming climate variation and change is not enough. There are other important factors in the distribution of the waterborne and vector-borne diseases associated with Aedes mosquitos and other mosquitos.

Dr Ermi Ndoen, an Indonesian epidimeologist based in UNICEF Indonesia, with his colleagues at Griffith University in Australia, recently showed an interesting result in *Malaria Journal* that malaria incidents in Indonesia tend to be distributed in boundary regions than non-boundary regions. One reason could be that the boundaries of regions/districts are the places that are too far away from the mental span of the local rulers and administrators.

Furthermore, Didier Musso, a molecular biologist and virologist from the Institut Louis Malardé, Papeete in French Polynesia have recently noted that the Zika virus in Brazil may be linked to the recent pattern of mobility. At least two events were mentioned in his paper *Zika Virus Transmission from French Polynesia to Brazil* published in the Emerging Infection Diseases in October 2015.

The first is the potential transmission either via vector (mosquito) during the 2014 Football World Cup in Brazil. The second is a similar transmission during Va'a World Sprint Championship canoe race held in Rio de Janeiro, Brazil. Recent Zika transmission via sexual connection in the United States may allow some to speculate that such a mechanism is possible.

Human global mobility and epidemics are not new. As the risk of Zika knows no boundary, what is now needed is greater cooperation to minimise the spread of the risk and be prepared for the next global epidemic. Malaria experts have often said that mosquitos are the true vampires as they live by sucking blood. Such claim is partially true because the lives of the vampire also depends very much on how much serious policy makers are willing to anticipate and contain the spread of virus and the vectors.

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