

EDITORIAL

Integrated Disease Surveillance — Current Need in Vector-Borne Viral Diseases in Nepal

Vector-borne diseases are responsible for 22.8% of emerging infectious disease events worldwide and 28.8% in the last decade. Mosquito-borne viral diseases are becoming a major public challenge and a priority for both research and public health globally. Dengue virus (DENV), Zika virus (ZIKA), Chikungunya virus (CHIKV), Japanese encephalitis virus (JEV), West Nile virus (WNV) are mosquito-borne viruses of significant clinical and public health importance in the South East Asia Region including Nepal.

DENV has been a global health threat affecting 2.4 billion people worldwide with more than 100 million cases of symptomatic dengue from > 128 countries across the globe. Likewise, ZIKA became a global threat after a large epidemic started from Brazil and spread globally while CHIKV is another emerging disease that has been spreading rapidly across south Asia in the recent years. More than one of these viruses can be transmitted by a common mosquito vector. For instance, dengue, zika, chikungunya are transmitted by *Aedes* mosquito.

In addition to the classical case-based surveillance, surveillance of arboviruses in mosquitoes is key to the control of these arthropod-borne viruses in humans.

With globalization and a changing climate, the frequency of outbreaks linked to mosquito-borne viruses will further increase, revealing a need to better detect viruses in vector populations).

Early detection of viruses in mosquito populations is essential to prevent and control the spread of these diseases. Detection of the natural infectivity in the mosquito for viruses is a crucial tool that has invaded the risk areas of transmission. When coupled with the data of human dengue infection and other arboviral infection, data from the mosquito on arboviruses not only provides crucial information on the spread and adaptation of dengue in Nepal's varied climatic conditions, but also help predict the next (future) outbreak in the country (both dengue and other viruses). This will ultimately contribute to the country's prevention and control programs with well-ahead plans before the actual outbreaks happen.

Moreover, there has been no systematic study comprised of hospital cases, community (population immunity) and mosquito surveillance to look at the actual dynamics of dengue in Nepal. In fact, there is no data on ZIKA, no molecular data on CHIKV and only single report available on WNV from Nepal. This indicates a huge research gap in mosquito-borne viral diseases in Nepal. Therefore, to understand the full-extent of virus transmission dynamics and potential roles of climate change in virus migration, an integrated virus surveillance system that comprises both human and mosquito component of multiple viruses at a time is essential apart from the classical case-based disease surveillance at hospitals.

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