

COMMUNITY-WIDE APPROACH KEY TO PREVENTION

# Zika control efforts pack a punch in fight against dengue



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The whole-of-society strategy for Zika control may have helped reduce the number of dengue cases in Singapore this past year.

Why would vector control efforts against Zika impact dengue? Because both diseases are transmitted by the same mosquito vector, *Aedes aegypti*.

As the *Aedes* mosquito thrives in tropical regions and remains highly adaptable to urban domestic environments, a community-wide approach remains critical to prevent the next dengue outbreak in the country.

Since 1969, dengue cases in Singapore have decreased with the imple-

mentation of vector control, surveillance, public health education and law enforcement.

The dengue resurgence in Singapore began around 1990, probably due to an increasing urbanisation with population growth that facilitated dengue transmission and the build-up of a non-immune population due to a low dengue burden in the past.

Large outbreaks of 14,209 and 8,826 cases were recorded in 2005 and 2007 respectively.

The largest occurred in 2013; with 22,170 cases and eight deaths.

In previous years, circulating strains alternated predominantly between DENV-1 and DENV-2, but the 2013 outbreak saw a newly introduced DENV-1 genotype III strain.

Although several countries are currently suffering from dengue out-



Thermal fogging being carried out in the vicinity of Block 102, Aljunied Crescent, last August where a 47-year-old Malaysian woman contracted the Zika virus in what is believed to be the first locally transmitted case.

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breaks (notably Sri Lanka), Singapore has seen a decreasing trend of dengue cases from 200 a week in June last year, to 70 a week in June this year.

The World Health Organisation declared Zika a public health emergency in February last year.

Singapore reported its first imported Zika case on May 13 last year, and its first locally acquired infection on Aug 27 last year.

The national Zika response included a multipronged approach: Increasing community awareness and the early detection of people with a Zika infection; isolation and prevention of transmission by mosquito-bites; and enhanced vector control, with the destruction of mosquito breeding habitats and adult mosquitoes.

The authorities readily shared information via the mainstream media, Internet and social media. Singapore's swift response was effective in controlling the spread of the virus.

The current lull in dengue activity this year could be a result of the Zika control efforts, or simply part of the normal ebb-and-flow pattern.

One of the challenges in Zika control is that a majority of the cases are mild or may have no symptoms. When the first Zika case was reported last year, the patient's close contacts were screened. Others living or working within the area who had a fever and rash were also tested.

Active screening of these people led to the identification of more "hidden" cases, who could have served as sources for the spread of the virus.

Similarly, the active screening of family members and neighbours of new cases in a non-dengue cluster may facilitate early detection and responses to limit the spread of the disease, in a way raising the alert level in dengue "hot spots".

Residents will also be more likely to use insect repellents and other personal protection measures, check for stagnant water around their households, and seek medical care if they develop a fever.

The rapid deployment of officers from the National Environmental Agency (NEA) to the affected areas to perform intensified vector control operations has helped control the spread of Zika. Such measures are also able to reduce transmission of the disease

whenever a new case is reported in a non-dengue cluster.

However, such efforts require manpower and use up substantial resources. For sustainability, Dengue Fighter Programme volunteers may be trained and tasked to conduct some of these vector control activities to augment the NEA's efforts during outbreaks.

As part of the whole-of-society approach, community contribution is equally important as is the response of local government agencies to achieve and sustain a low dengue burden.

It may prove impossible to eradicate dengue in Singapore, but we have been able to sustain relatively low infection rates on a number of occasions, such as in 2012 and, recently, likely due to Zika control.

However, this "success" potentially contains the seeds of possible failure. Low rates of infection might ironically result in a build-up of a non-immune population against dengue, which provides fertile ground for a larger outbreak in the future. One possible solution would be a more widespread use of the dengue vaccine.

Currently licensed and available for those aged 12 to 45 years since early March this year in Singapore, the vaccine offers only 43 to 55 per cent protection against DENV-1 and DENV-2 — the most common strains circulating here — and requires three doses over 12 months for full protection. It may, therefore, be of limited use for immediate personal protection.

That said, from a wider public health perspective, this vaccine may still have some community-level benefits, by reducing the proportion of viremic individuals among the susceptible population and therefore limiting future onward transmission, and by protecting against the future introduction of less-common strains, DENV-3 and DENV-4.

Further investment in the development and deployment of the vaccine would make dengue control more sustainable as part of the multipronged approach in the long-run.

It is also important to note that when it comes to the battle against dengue and its *Aedes* vector, both have proven highly resilient and rapidly adaptable to evolving human or urban environments.

As such, sustaining and ramping up active, integrated, community-wide mosquito-breeding control efforts and public engagement will remain key to preventing the next dengue outbreak.

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