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Research Summary

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Category (clinical/public health):	Public Health
Data focus:	SHEFA

Title Deployment of Wolbachia-infected mosquitoes in Port Vila to reduce dengue

Abstract

Wolbachia is a natural occurring bacteria found in 60% of all insect species. It is used to eliminate/reduce the burden of Dengue Fever, Chikungunya and Zika Virus diseases. Unlike most other vector control initiative, it is known as a biological control method and is natural and self-sustaining and helps to protect communities from mosquito-borne diseases without posing a risk to natural ecosystems or human health.

In 2018-2019, locally-collected Aedes aegypti mosquito eggs from Port Vila were raised to adult mosquitoes in the MOH Entomology Lab. Eggs from these adults (1 st Generation) were sent to the Entomology Lab at Monash University in Melbourne. Wolbachia bacteria were micro-injected into the eggs. Hatching of these eggs that contained Wolbachia and mating with male mosquitoes in the laboratory gave rise to a new (2 nd) generation of Wolbachia-infected mosquitoes, called "W". Then the eggs of this generation (2 nd) were sent to Vanuatu and were reared and released as adults within twelve (12) reporting areas around Port Vila. Capsules were also created that stored one thousand plus eggs and these were released into water containers by primary school children at their home backyards so that adult W mosquitoes would emerge.

Indications are that the Wolbachia project has progressed well to date with an increase in frequency in Ae. aegypti populations throughout Port Vila. Recent monitoring in April 2021 shows that overall, Wolbachia is present in 79.4% of Ae. aegypti tested with more than 80% frequency in almost all reporting areas. Although recent monitoring shows good establishment and survival of Wolbachia carrying Aedes aegypti mosquitoes in Port Vila, the recent dengue outbreak from April to August 2021 poses a question on whether or not this method is really a success in reducing disease burden. Further monitoring is required to determine if the sporadic cases seen across Port Vila within areas with high Wolbachia frequency may be due to a secondary vector, Ae. albopictus.