Zika Mozzie Seeker

Initiative Type

Data Collection

Status

Deliver

Added

01 February 2018

Last updated

23 November 2023

URL

https://test.clinicalexcellence.qld.gov.au/improvement-exchange/zika-mozzie-seeker

Summary

Queensland Health’s Zika Mozzie Seeker (ZMS) is transforming urban mosquito surveillance by linking citizens to a world-first molecular diagnostic methodology. The ‘ZMS system’ integrates three innovations:

1. Novel diagnostic method (Forensic and Scientific Services):

- Molecular analyses use polymerase chain reaction (PCR) to rapidly screen the genetic material from large numbers of local mosquitoes for ‘traces’ of Aedes aegypti. A single Ae. aegypti can be detected amongst 5,000 Ae. notoscriptus (local species).
- Batching the eggs from multiple ovitraps (x10-20) into a cohort for each PCR enables high throughput and efficiencies, thereby revolutionising traditional survey methodology.

2. Citizen-science (Metro South Health):

- Participants assemble a DIY egg trap in their back yard, using a free ‘egg collection kit’ supplied by Metro South’s Public Health Unit (PHU). Eggs were returned in self-addressed envelopes for counting and batching, prior to molecular analyses.
- Electronic communications via Metro South’s ZMS website https://metrosouth.health.qld.gov.au/zika-mozzie-seeker include a ‘notification service’ (SMSs and/or emails).

3. Decision Support System (Metro South Health PHU):

- Participant and egg sample information are barcoded.
- A webcam captures egg images for automated egg counting. Individualised egg counts are provided to each participant, and these values are used to batch eggs for PCR cohorts.
- ‘Dashboard analytics’ track ZMS outputs (e.g. participation rates, ‘heat maps’ of egg abundance) , participant feedback (SMS, email, ZMS website).

The project won the Pursuing Innovation Award for Outstanding Achievement at the 2017 Queensland Health Awards for Excellence.

Key dates

Jan 2017

Implementation sites

Metro South Hospital and Health Service

Partnerships

It is one of Australia's first health-based 'citizen science' projects and a fun way for members of the public to get involved in a vital study.

Key Contacts

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Aim

To efficiently identify the Aedes aegypti mosquito eggs in areas where it is not present and stopping the spread of Zika and dengue viruses.

Benefits

- Citizen scientists linking with clinical technology
- Early detection of Zika and dengue viruses

Background

The Zika virus is spread by one type of mosquito which is common in north Queensland, but has not been seen in South East Queensland since the 1950s. The project aims to increase confidence that mosquitoes with the potential to spread Zika or Dengue viruses have not invaded the southeast region.

Solutions Implemented

The process involves batching eggs from many traps (10-20) into each test, enabling screening of many sites for Aedes aegypti faster and more efficiently. This DNA testing allows scientists to screen up to 5,000 mosquitoes in one sample and easily detect if there is an Aedes aegypti mosquito in the sample. Previously, scientists had to painstakingly examine each wriggler or adult that hatched from each egg under a microscope. Using this technique, it’s now possible to test the large amount of eggs that could result from monitoring mosquitoes in backyards across a large urban area, such as the Metro South Health region. This will give scientists a better chance of detecting an invasion, so populations can be eradicated before they can spread Zika and Dengue viruses. We have managed to offer Zika Mozzie Seeker (ZMS) over three consecutive years for a total of six rounds. For the last two years we have also included diagnostic testing for the other Zika mosquito that is present in Torres Strait islands of North Queenslandld (Aedes albopictus) .

Evaluation and Results

There was a huge interest amongst residents in the region to sign up for a backyard mosquito egg trap at home, collect the eggs and send them to the Metro South Public Health Unit where they were sorted, counted and batched prior to testing.In the first year (2017), Metro South received 1,217 envelopes from participants, 448 envelopes in 2018 and 555 envelopes in 2019.
The project has received two internal Metro South awards. Other accomplishments were:

- Nominated as finalist in 2018 and 2019 for: Australian Museum Eureka Prize for Innovation in Citizen Science

- Project commemorated as one of the Australia Post citizen science stamps in May 2020.

The Zika Mozzie Seeker website has all the latest results and updates of this project's progress.

References

Zika Mozzie Seeker

Further Reading

Zika Mozzie Seeker Website