

# Implementing a novel vector-borne disease sentinel surveillance system with integrated molecular diagnostics in Papua New Guinea



## STRIVE PNG Investigator Team

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## Background

Papua New Guinea (PNG) is currently in a critical phase of vector-borne disease control and improving access to timely data for decision-making is of paramount importance. Following a period of declining malaria burden after scale-up of control efforts there has been a resurgence of malaria in many areas and continued transmission of arboviruses. The STRIVE PNG project is a consortium of organisations from PNG and Australia working together to:

- 1) strengthen VBD molecular surveillance and response systems;
- 2) develop policy options for key health system supports (Figure 1)

STRIVE PNG is currently in the early phase of implementation.

## Approach

As part of a comprehensive goal to generate evidence on the implementation of rapid-response models of genomics-informed surveillance strategies for malaria (and other vector-borne diseases) in PNG, a network of 8 sentinel surveillance sites is being established to capture malaria and arbovirus incidence and key morbidity and mortality indicators (Figure 2).

To allow for real-time actionable data sentinel facilities electronically report case-level data to a cloud-based spatial decision support platform using the Tupaia platform. Molecular diagnosis and resistance marker identification are integrated in near-real time and parasite genomics integrated later into the system.

Figure 1: STRIVE PNG Integrated Surveillance system conceptual framework aligned to STRIVE objectives and aims

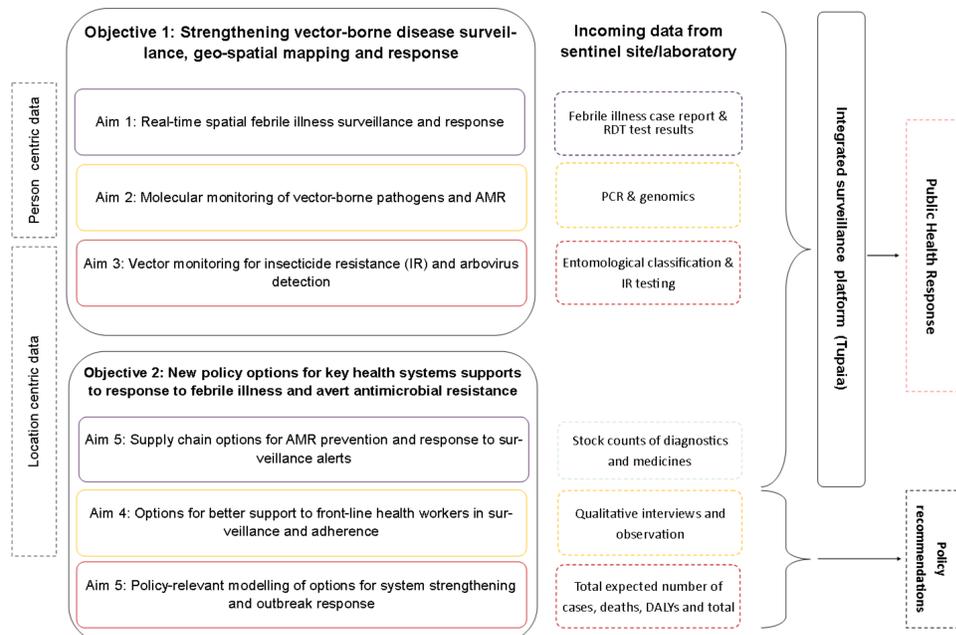
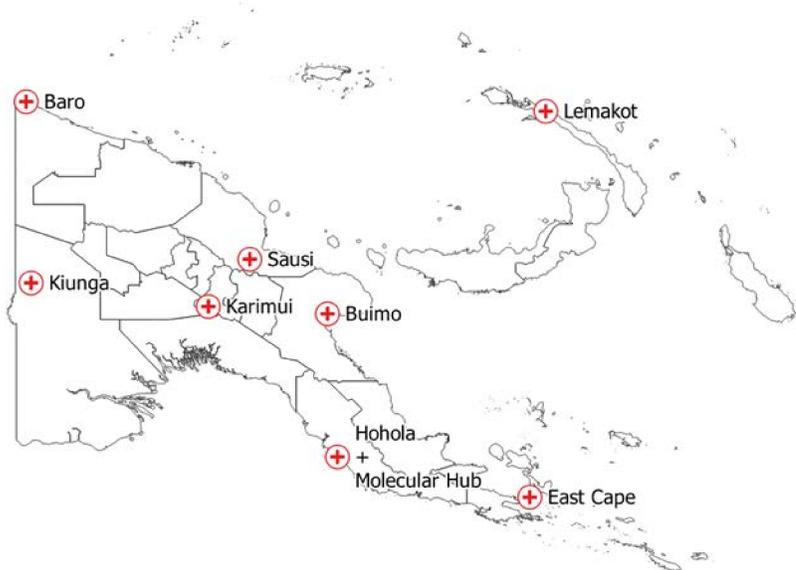


Figure 2: STRIVE PNG sentinel sites



## Surveillance system data attributes

### Daily

- febrile patients with suspected malaria or fever of unknown origin enrolled at sentinel site
- case details collected using Tupaia Meditrak app and uploaded to Tupaia
- dried blood spot (DBS) collected

### Weekly

- DBS couriered to molecular hub in Port Moresby
- molecular diagnostic testing for malaria, Pf K13 C580Y and arbovirus
- SNP-based genotyping
- results uploaded to Tupaia

### Bi-Annually

- larval and adult trapping; human landing catches; larval habitat surveys.
- Morphological mosquito ID; vector distribution; insecticide resistance testing; vector behaviour
- all uploaded to Tupaia



Figure 2: Weekly surveillance report dashboard (working examples) and Tupaia spatial user interface for STRIVE PNG sentinel surveillance illness surveillance network

