PacMOSSI
Pacific Mosquito Surveillance Strengthening for Impact

AEDES SURVEILLANCE FOR ACTION

Practical Workshop

10-14 November 2025 | Honiara, Solomon Islands

Training Report

Rationale

Mosquito-borne diseases such as dengue, chikungunya and Zika virus remain critical health threats in the Pacific region. In 2025 alone, dengue outbreaks have been declared in 10 Pacific Island Countries and areas (PICs). This workshop was designed to support PICs to develop surveillance plans for monitoring of *Aedes* mosquito species distribution, seasonality and habitats. This information is critical to inform targeted and effective mosquito control strategies – and to enhance preparedness and response for *Aedes*-borne diseases in the Pacific.

Course Overview

The workshop was held from 10 to 14 November 2025 in Honiara, Solomon Islands. Sessions were held at the Honiara Hotel and at the Solomon Islands National University (SINU) campus.

Objectives

The objectives of the workshop were for participants to understand the purpose and methods used for *Aedes* vector surveillance and to develop competence in their implementation, including to:

1. Identify the *Aedes* mosquito adults and larvae and differentiate from other species such as *Anopheles* and *Culex*;
2. Understand the linkage between mosquito surveillance and selection of vector control strategies; and,
3. Develop plans for mosquito surveillance to be undertaken following the workshop in participants' home countries.

Schedule

Sessions were held over 5 days and included classroom learning, practical field and laboratory demonstrations, and hands-on participation. There was an emphasis on ensuring that participants developed the capacity to conduct *Aedes* surveillance upon returning to their workplaces.

Attendees

In attendance were 20 participants from 15 PICs, 6 facilitators from 4 organisations (James Cook University, QIMR Berghofer Medical Research Institute, Solomon Islands National University and Institut Pasteur of New Caledonia), and 1 observer from The Pacific Community (SPC).

Participants

Country	Name
American Samoa	Metotagivale Meredith
Cook Islands	Nelson Ngaiorae
Cook Islands	Paul Maaka
Fiji	Shonam Reddy
French Polynesia	Noemie Piivai
Guam	Georgette Quidachay
Kiribati	Lavinia Kareaua Boorau
New Caledonia	Mederick Mahossem
Niue	Andy Manu
Papua New Guinea	Stephen Gideon
Samoa	Elisapeta Toleafoa
Samoa	Pasefika Amituanai
Solomon Islands	Francis Suraau
Solomon Islands	George Fafale
Solomon Islands	Joy Kaimauri
Solomon Islands	Rolex Havea
Tonga	Siaola Mahe
Tuvalu	Monica Malua
Vanuatu	Christie Makikon
Wallis & Futuna	Malia-Kalemeli Selemago

Facilitators and observers

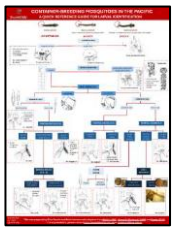
Organisation	Name
James Cook University	Amanda Murphy
QIMR Berghofer Medical Research Institute	Brian Johnson
QIMR Berghofer Medical Research Institute	Elina Panahi
Solomon Islands National University	Edgar Pollard
Solomon Islands National University	Hugo Bugoro
Institut Pasteur of New Caledonia	Nicolas Pocquet
The Pacific Community	Sala Saketa

Resources

The following key resources were used during the workshop:

PacMOSSI Participant Workbook*:* the Workbook provides a simplified overview of key technical content with links to relevant resources. This workbook and other workshop materials are available online at: https://pacmossi.org/resource-category/training-materials/

PacMOSSI Identification key: *A morphological identification key to the mosquito disease vectors of the Pacific including medically important vectors* provides a basic guide to adult mosquito identification relevant to the 21 PICs supported by the PacMOSSI consortium.



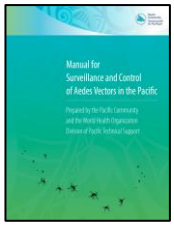
PacMOSSI Job aids: Some quick-reference job aids were provided to participants to use as print outs or posters in mosquito laboratories in PICs. These included *Container breeding mosquitoes in the Pacific: a quick reference guide* for larval identification and Known distribution of *Aedes* vectors in the Pacific: a quick reference guide.

PacMOSSI Presentations: Selected topics were overviewed in PowerPoint presentations developed by PacMOSSI, including content from the online course.

Training and other materials for the workshop are also available on the PacMOSSI website at https://pacmossi.org/event/pacmossi-2025-practical-workshop/ or by emailing pacmossi@jcu.edu.au

Content

This workshop built on content from the PacMOSSI online course. Modules can be accessed by registering via the PacMOSSI Online Course webpage. Additional content was drawn from the below documents.



SPC/WHO *Manual for surveillance and control of Aedes in the Pacific* is designed for programme managers, operational staff and collaborating partners responsible for planning, implementing, monitoring, and evaluating national vector control programmes.

PacMOSSI *Standard Operating Procedures* for *Aedes* provide comprehensive, standardised protocols for mosquito surveillance and control tailored to PICs. These encompass methodologies for mosquito surveillance, processing, storage, and insecticide resistance testing, ensuring consistent and effective practices across the region.

CDC *Surveillance and control of Aedes aegypti and Aedes albopictus in the United States* provides standardised guidance for detecting, monitoring, and managing these vectors to reduce the risk of arboviral disease transmission. It outlines best practices for integrated surveillance methods, data interpretation, and control strategies tailored to local ecological and epidemiological conditions.

Topics covered included:

- Topic 1: Why? Objectives of *Aedes* surveillance
- Topic 2: What? Targets for *Aedes* collection
- Topic 3: How? Methods for *Aedes* collection
- Topic 4: Where? Sites and locations for *Aedes* collection
- Topic 5: When? Timing and frequency for *Aedes* collections
- Topic 6: Which? Indices calculated from *Aedes* collections
- Topic 7: Who? Engaging communities for *Aedes* collections
- Topic 8: And? Use of data from *Aedes* surveillance
- Topic 9: Then what? *Aedes* mosquito control

Schedule

Key	*Classroom learning*	*Laboratory sessions*	*Field activity*

<table>
<tr><th></th><th>10 November</th><th>11 November</th><th>12 November</th><th>13 November</th><th>14 November</th></tr>
<tr><td>09:00-09:15</td><td>Opening</td><td>Review of Day 1</td><td>Review of Day 2</td><td>Review of Day 3</td><td>Review of Day 4</td></tr>
<tr><td>09:15-10:30</td><td>Introduction and course overview
Solomon Islands MOH experiences in vector control</td><td rowspan="2">Topic 6: Which? Indices calculated from Aedes collections</td><td rowspan="2">Field practice in adult mosquito surveillance (trap setting)</td><td rowspan="2">What? Adult trap collection and mosquito identification continued</td><td rowspan="2">Group activity: Design baseline surveillance</td></tr>
<tr><td>10:30-10:45</td><td>BREAK</td><td>BREAK</td><td>BREAK</td><td>BREAK</td><td>BREAK</td></tr>
<tr><td>10:45-12:30</td><td>Pre-workshop test
Topics 1 & 2: Why and What? Objectives and targets for Aedes surveillance</td><td>Topic 9: Then what? Aedes mosquito control
Field practice in larval surveillance</td><td>Revisit Topic 2: What? Larval and adult Aedes identification</td><td>Topic 8: And? Use of data from Aedes surveillance</td><td>Course review and group discussion session
Closing Post-workshop test and feedback forms</td></tr>
<tr><td>12:30-13:30</td><td>LUNCH</td><td>LUNCH</td><td>LUNCH</td><td>LUNCH</td><td>LUNCH</td></tr>
<tr><td>13:30-15:30</td><td>Topic 3: How? Methods for Aedes collection
Topics 4 & 5: Where and when? Sites, locations and frequency for Aedes collections</td><td>Survey of breeding habitats within SINU campus</td><td>What? Identification of field collected mosquitoes</td><td>Topic 7: Who? Engaging communities for Aedes collections</td><td></td></tr>
<tr><td>15:30-15:45</td><td>BREAK</td><td>BREAK</td><td>BREAK</td><td>BREAK</td><td></td></tr>
<tr><td>15:45-17:00</td><td>Tour of Honiara mosquito habitats and larval collections</td><td>Field activity: larval survey & source reduction (tip, toss, treat)</td><td>What? Mosquito identification practice continued</td><td>Group discussion on implementation barriers and PacMOSSI support</td><td></td></tr>
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Proceedings

Field, laboratory, and classroom sessions were held to develop competence in how to collect *Aedes* mosquitoes from the field, how to identify *Aedes* mosquitoes, and how to use the data generated. In-field demonstrations were provided of larval and adult surveillance methods, as well as source reduction and larviciding using the "tip, toss or treat" concept. These were followed by practice conducting field collections of *Aedes* mosquitoes and implementing "tip, toss, treat" in groups.

Different types of *Aedes* collection methods and surveillance types were introduced along with the common entomological indicator data generated by each. Linkage of *Aedes* surveillance indicators to control strategies in different scenarios were discussed, along with the importance of community engagement.

The final morning of the workshop included a small group activity to design a mosquito survey to identify the key vectors of dengue aimed to inform a community engagement campaign. Participants were asked to consider and plan the required steps, resources and data tools, how the community would be engaged before, during and after surveillance, and how the data would be used to inform mosquito control strategies. The participant discussion and feedback from the small group work activity to design mosquito surveys is summarised below.

Finally, participants discussed the application of learned skills upon their return home, including preferred follow up support for mosquito surveys in PICs to potentially be provided by PacMOSSI and SPC, and the use of PacMOSSI communication channels for ongoing peer support.

Summary of participant feedback regarding the in-country requirements to conduct Aedes vector surveillance to cover at least 20% of houses within 10 villages/communities over 2 weeks.

Component	Suggestions provided through group work
Human resources	• Required staff to conduct surveys varied between 4 and 25 staff, who would be split into teams, depending on the country/context. • Recruitment of local volunteers from the target communities was also suggested to aid efficiency and community engagement. • Team roles would be split to enable some staff to do mosquito collections and others to communicate with community members, conduct mosquito identification and data entry/reporting.
Equipment and supplies	• Equipment needed included larval and adult surveillance equipment, larvicides and repellent for staff and either phones, tablets or paper forms for data collection.

	• Between 2-5 vehicles would be needed, depending on team size/structure.
Data collection considerations	• Local staff teams need to be trained in data collection forms and surveillance methods. • Depending on size, teams would aim to visit 1-2 villages/day and aim for 25-30 houses/village. • Surveys would either be conducted for full or part days, depending on the weather, allowing time for mosquito identification and data entry either in the afternoons or every second day. • Proposed data collection tools included various platforms such as Kobo Toolbox, Tupaia Meditrak and QGIS, with one group choosing a combination of paper and electronic tools.
Community engagement and reporting the findings	• The community would be engaged either through village/church leaders and/or social media and/or traditional media, depending on what was appropriate for the specific country/context. • Survey reports would include both graphs and heat maps and presented as a written report and/or a PowerPoint to the Minister of Health. • Data on key breeding habitats identified would be communicated as key messages for the community.

Outcomes

Basic training in field collection and identification of mosquitoes to inform mosquito control strategies was delivered to the satisfaction of the participants (see course evaluation results below), along with significant practice in design of mosquito surveys for local contexts.

Media coverage
A media release was developed by PacMOSSI in collaboration with core and host partners (see here). Social media posts were made on owned channels, including Facebook, Twitter, and LinkedIn. These included posts before (see here), during (see here, here and here) and after (see here) the workshop.

Impact video
A video summarising the workshop was developed as part of a new PacMOSSI Impact series (see here). Shorts from the longer video were also developed for dissemination on social media platforms (see here).

Assessments

Pre- and Post-Course Tests
Participants were issued a standardised written assessment at the beginning and at the end of the workshop. This included a self-assessment of activities related to *Aedes* surveillance, taxonomy and control, with 10 multiple-choice questions.

For the self-assessment, participants reported an overall improvement in competence to perform basic mosquito surveillance and control tasks, such as explaining how dengue is transmitted, the difference between *Aedes* and *Culex* species, and describing when different types of *Aedes* control methods might be used.

For the multiple-choice test, the average score before the workshop was 6.2 out of 10. This increased to 7.6 out of 10 for the post-course test (using the same questions). Seventy-six percent of participants improved on their score between the pre- and post-course assessment, indicating an improvement in their technical knowledge during the workshop.

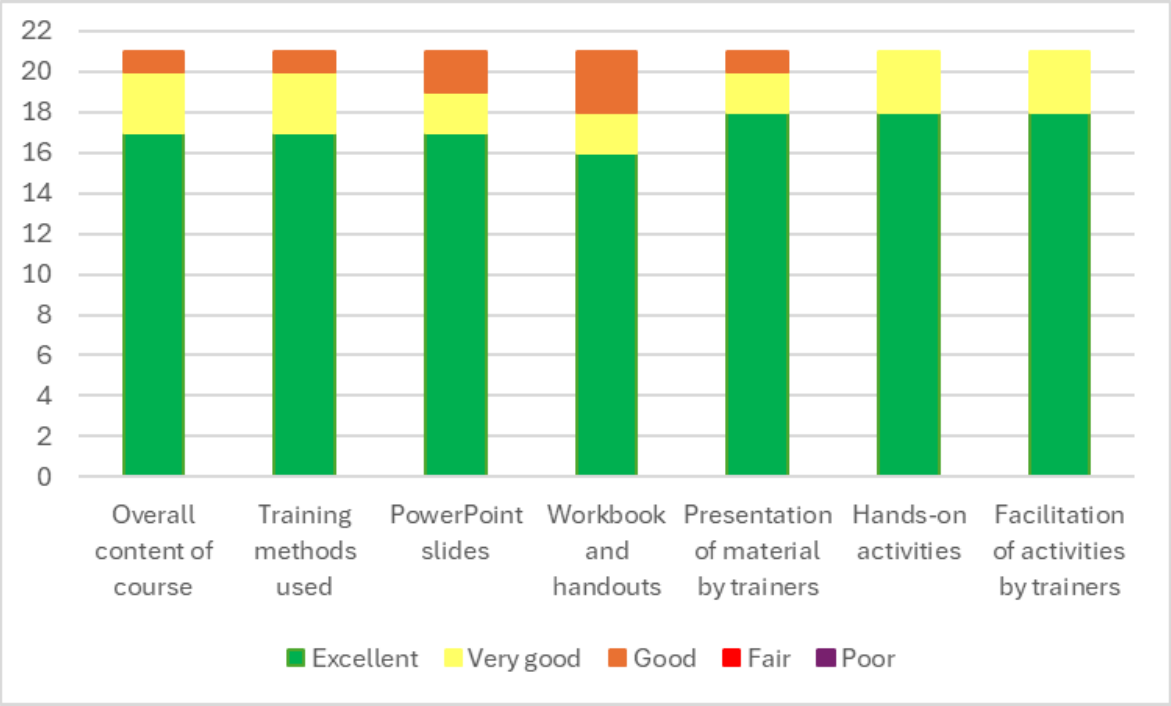
Course Evaluation
Participants completed an evaluation of the workshop at the conclusion of the technical program. The evaluation included rating various course components (content, exercises, handouts, and facilitation) as 'poor', 'fair', 'good', 'very good', or 'excellent'. 21 participants completed course evaluation forms. Most participants rated the workshop elements as 'excellent' (82%) or 'very good' (12%), as shown in the figure below.

Four open-ended questions gathered information on: course topics respondents would like more information on, which course topics were most and least useful for their *Aedes* control programs, and any other comments or suggestions to improve future trainings.

The most common points of feedback provided were:

1. Practical aspects of the course were most valued, but participants requested more field activities (e.g., collection of mosquitoes) and more taxonomy.
2. More information was requested on how to engage with communities and on how to collect and manage data related to mosquito surveillance.
3. Some participants wanted more information on vector control, such as how to use chemical products.

Ratings of 7 course components by participants (n=21).



Closing

The final session concluded with facilitators thanking participants for their active and positive engagement throughout the entire workshop program. Participants and facilitators acknowledged that further work is required in each country to ensure that *Aedes* surveillance is strengthened based on standard procedures and requirements to guide evidence-informed vector control.

A vote of thanks was then issued by participants and the Solomon Islands Ministry of Health and Medical Services for the work of the facilitators and support staff to ensure the course was useful, well-organised and enjoyable.

Conclusions

The training workshop was effective at providing basic training in Aedes mosquito surveillance and control, with excellent feedback from participants showing strong gains in self-reported confidence to perform mosquito surveillance tasks and consistent gains in participant technical knowledge.

In line with participant feedback, future PacMOSSI training events will aim to be designed to enable further time for field activities and to practice applying the skills learned, with added focus on data management and community engagement. A separate workshop focussed on *Aedes* vector control will be a priority.

About the PacMOSSI consortium

PacMOSSI is a regional partnership of 21 Pacific Island Countries and areas with 7 international institutions working to combat mosquito-borne diseases throughout the Pacific. It comprises a series of initiatives coordinated by James Cook University in collaboration with The Pacific Community (SPC). Support to PacMOSSI – including for this workshop – is provided by the Australian Government through Partnerships for a Healthy Region, the French Government, the New Zealand Government, and the European Union.

Selected images from the course

Additional images are available here. The video is available here.