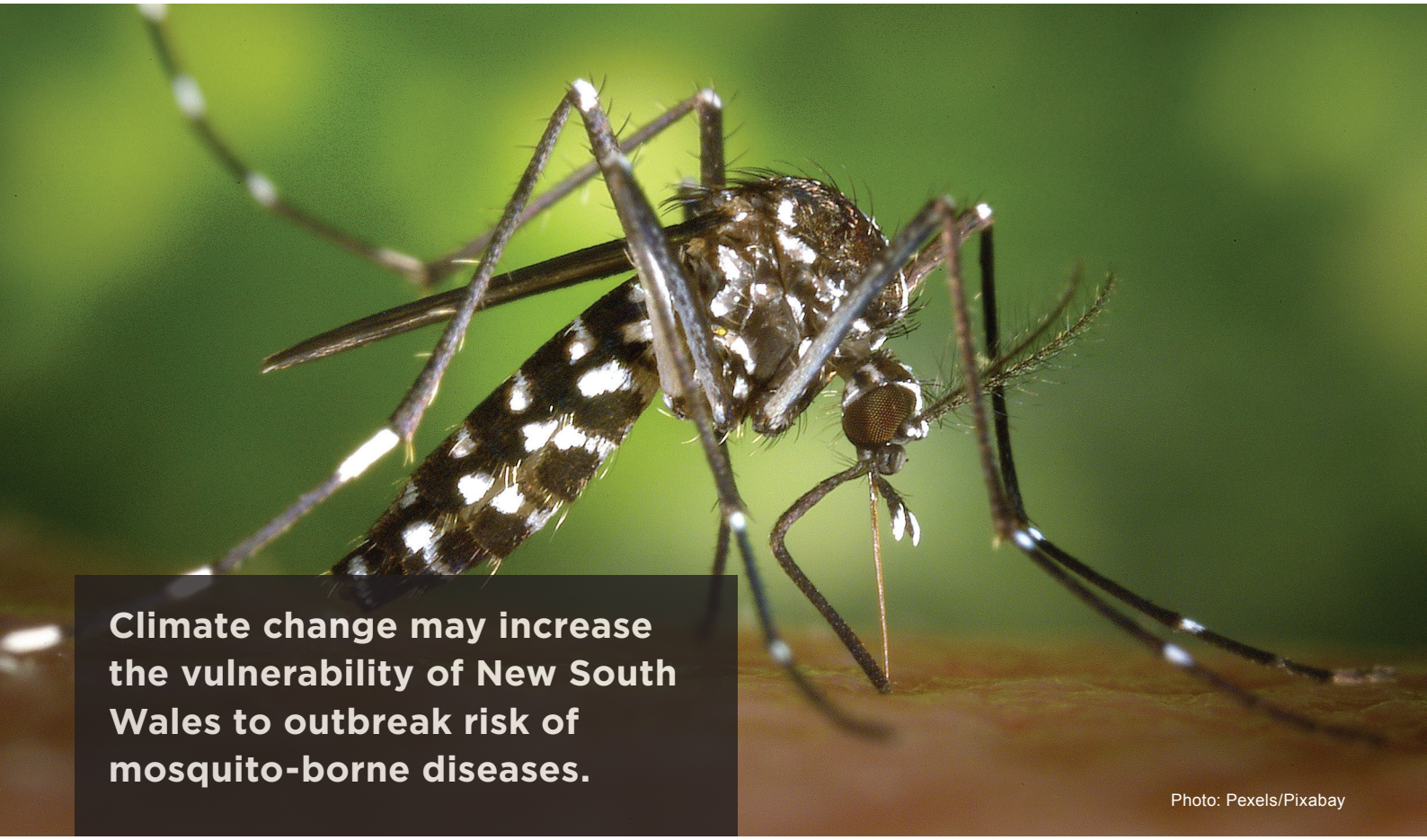
Human Health and Social Impacts Node

Assessing novel surveillance technologies to detect exotic mosquitoes in northern NSW



Climate change may increase the vulnerability of New South Wales to outbreak risk of mosquito-borne diseases.

Photo: Pexels/Pixabay

A changing climate, specifically increasing temperature, rainfall and extreme weather events may create favourable conditions in New South Wales for the exotic mosquitoes to become established in the region. These mosquitoes will increase the outbreak risk of mosquito-borne diseases caused by pathogens such as dengue, chikungunya and Zika (viruses not currently transmitted by endemic mosquitoes) and threaten the capacity of local authorities to respond effectively to increased public health threats. Investigating the operational and scientific advantages of these approaches for the surveillance of exotic mosquitoes such as *Aedes aegypti* and *Aedes albopictus* is critical.

Dr Cameron Webb (University of Sydney, NSW Health Pathology) has been engaged by Tweed Shire Council to assist the development of a North Coast Exotic Mosquito Response Plan. The aim of the North Coast Exotic Mosquito Response Plan is to develop an operational framework for capacity building in the region. Field-based surveys are expected to be undertaken between November 2017 and March 2018 to assess the associations between endemic mosquitoes and local habitats.

The project offers an opportunity to assess novel surveillance technologies for exotic mosquitoes.

It is proposed that molecular testing (i.e. Rapid Surveillance of Vector Presence (RSVP) ovitraps) of mosquito eggs to provide rapid identification of endemic and exotic species. This approach may reduce the costs of intensive property surveys currently required to determine the presence of key mosquitoes, remove substantial barriers to building resilience in the local public health sector and help develop adaptive public health response strategies.

Research outcomes

- An understanding of novel surveillance technologies (specifically the RSVP approach) for exotic mosquitoes in northern NSW, identifying any field or laboratory-based barriers to potential incorporation into the existing state-based mosquito surveillance program. As part of this assessment, reference specimens of exotic mosquitoes (e.g. *Aedes aegypti*) will be incorporated into testing as a quality assurance measure, irrespective of the presence or absence of exotic mosquitoes from the study area.
- The cost-effectiveness of using the RSVP method for rapid and broad-scale assessment of exotic mosquito risk in northern NSW; the costs associated with laborious property inspection, immature mosquito collection, rearing and identification of field-collected specimens are a substantial barrier to effective strategic surveillance and response plans and may be overcome with the RSVP approach.
- Confirm the absence of *Aedes aegypti* and *Aedes albopictus* within study sites of northern NSW, providing baseline data on existing exotic mosquito presence and risk (as represented by abundance of endemic mosquitoes sharing comparable habitats such as *Aedes notoscriptus*) for the further development and delivery of adaptive and strategic response plans in the face of changing climate and exotic mosquito-borne disease risk.

Who will use this information?

- NSW Health and NSW Health Pathology – the results will inform future decision on the incorporation of endemic and exotic mosquito surveillance into the existing NSW Arbovirus Surveillance and Mosquito Monitoring Program and expansion of this approach to regions outside of northern NSW.
- Tweed Shire Council – will provide valuable training in the development of operational procedures to be incorporated in mosquito surveillance and control program.

Human Health and Social Impacts Node

Building on current sources of health and climate change information, the Human Health and Social Impacts Node will support the NSW Government by:

1. delivering robust, sector-specific information targeting the health system, vulnerable communities and government agencies
2. establishing baselines for monitoring, evaluation and analysis of adaptation programs that seek to protect and promote health, and strengthen the delivery of health services, in the face of a changing climate
3. improving understanding of vulnerability in the context of exposure, sensitivity and adaptive capacity
4. providing practical information on building resilience in communities and in the health sector.

The work program of the Node is informed by eco-social understandings of relationships between climate change and health. The approach taken acknowledges the range of environmental, social and economic consequences of climate change, including regional variation in impacts and vulnerability.

The Node is a partnership between:

- **Department of Planning, Industry and Environment**
- **University of Sydney**
- **NSW Health**

More information
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