



Te Niwaha

Research Project Impact Case Study

A national burden of disease analysis of water-borne disease in Aotearoa New Zealand from community drinking water infrastructure

Māngai Wai Māori: Ngāi Tahu drinking water programme

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Introduction

Between 18,000 and 34,000 people in Aotearoa develop acute gastrointestinal disease (AGI) annually from contaminated drinking water. People relying on smaller supplies: 1) receive poorer quality water; 2) have fewer safeguards; and 3) have the least capacity to address these inequities.

Taumata Arowai, the new water services regulator, is introducing rules requiring registration for marae and other small providers. However, the extent of consultation with tangata whenua and support for supply managers remains unclear. This project aimed to establish a Māori-led audit and surveillance programme for marae drinking water systems in the Ngāi Tahu takiwā through collaboration between the University of Canterbury, Te Kura Taka Pini (TKTP), rūnanga within Ngāi Tahu, Water New Zealand and the Institute of Environmental Science and Research (ESR).

The programme, led by TKTP, involved 1) recruitment and training of water champions (Māngai Wai Māori, name gifted by Te Maire Tau - meaning representative of freshwater); 2) a comprehensive audit of drinking water systems at 11 un-reticulated marae; and 3) the implementation of a microbial testing programme for marae drinking water.

Results

The programme developed a bespoke online training course for Māngai Wai Māori, supported by Water New Zealand. It provided information on sample collection, storage, transport, result interpretation and interventions for drinking water supplies. In total, 22 whānau members were trained, 19 as Māngai Wai Māori representing 16 papatipu rūnanga within the Ngāi Tahu takiwā. Quarterly tests for a year included E. coli, total coliforms, one-off meta-genomics, and routine drinking water tests. Results highlighted previously unknown enteric disease and chemical risks at some marae, which rūnanga rapidly addressed. Drinking water infrastructure audits are due for completion in June 2025.

Impact

Marae-based water monitoring, including access for the wider community, has enabled regular contamination surveillance. The Māngai Wai Māori programme has strengthened drinking water safety knowledge for Māngai Wai Māori and rūnanga leadership and is building a network of whānau skilled in water testing. The programme identifies drinking water safety gaps and supports rūnanga to ensure safe supplies.

Additional community-driven research projects have already emerged, including bacterial contamination of rainwater and nitrate contamination in groundwater. Some rūnanga are considering expanding Māngai Wai into freshwater quality monitoring and management. This rūnanga-driven evolution helps ensure the programme serves community aspirations beyond the current project. Additional funding from the MBIE Endeavour Research Programme will continue the programme for four more years (Applications of Metagenomics and Quantitative PCR for Safer Drinking Water).

Feedback from papatipu rūnanga is that new Taumata Arowai standards are too complex and difficult for marae to meet within short timeframes. The audit results will be integrated into water safety and source water risk management plans to help rūnanga meet these requirements in partnership with Taumata Arowai.

Results from the programme and audits will also benefit people relying on domestic self-supplies. Around 800,000 people (15% of Aotearoa) source drinking water from unregulated supplies, which are more vulnerable to contamination due to shallow bores or untreated streams and rainwater. This project's findings could help these communities protect and treat their drinking water to reduce disease risk.

The Māngai Wai programme is an effective, community-driven and academically supported methodology that could be used by other iwi, hapū, and community groups. We aim to publish the full methodology and results by year-end, making them openly available to others.