Research Project Impact Case Study

AMR reference laboratory and pathogen genomics capability for Fiji

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Introduction

Antimicrobial resistance (AMR) remains one of the most urgent health challenges facing the Pacific. Fiji in particular has seen rising rates of carbapenem-resistant Acinetobacter baumannii, Klebsiella pneumoniae, Escherichia coli and Pseudomonas aeruginosa, with several high-risk strains circulating within and between hospitals since 2016 without real-time genomic surveillance. This project directly addresses that gap by establishing the first fully functional AMR genomic surveillance system in Fiji and building the foundational capability to extend this model to other Pacific Island Countries.

Over the past year, the project has achieved significant scientific and operational milestones. We successfully established MinION-based sequencing capacity at Fiji National University, enabling local generation of high-quality genomic data for priority pathogens. This has transformed Fiji's surveillance capability from retrospective and external-lab dependent processes to real-time, in-country genomic epidemiology. Training delivered to FNU staff has strengthened technical skills in DNA extraction, library preparation, QC, data analysis, and interpretation of AMR genotypes. This has contributed to a sustainable local workforce capable of supporting ongoing national surveillance.

Key achievements

A key achievement has been the implementation of national sample referral pathways, allowing isolates from CWMH, Lautoka, Labasa and selected private laboratories to be transported routinely to FNU for sequencing. This ensures that genomic surveillance is integrated into routine diagnostic workflows and supports early detection of outbreaks. Sequencing efforts have already revealed persistent high-risk clones among CROs, including A. baumannii ST2, K. pneumoniae ST6260, E. coli ST410, and P. aeruginosa ST773, with evidence of continued circulation across multiple hospitals since 2020 and earlier for A. baumannii ST2. These findings provide essential insight into transmission dynamics and the spread of mobile resistance elements, informing infection prevention and control strategies across Fiji.

The project also established a national Fiji Microbiology Network Group, creating a collaborative platform for harmonising laboratory protocols, strengthening data reporting, and building a cohesive national approach to AMR surveillance. Through this initiative, laboratories are now aligned on CLSI-based practices and are supported in transitioning toward standardised data submission for WHO GLASS.

This project further advanced Fiji's capacity to evaluate novel antimicrobials through the development of optimised susceptibility methods for CROs. This offers clinicians access to early evidence on treatment options for highly drug-resistant infections and positions Fiji as a regional contributor to antimicrobial discovery efforts.

Impact

Overall, this work has accelerated Fiji's progression towards becoming a Pacific AMR Reference Laboratory and regional hub for genomic epidemiology. The combination of local sequencing, harmonised laboratory networks, strengthened technical capacity and regional partnerships has already demonstrated clear scientific excellence, strong applied outcomes and significant public health impact. Over the coming year, we will expand the surveillance network, deepen regional collaboration, integrate sequencing outputs into national policy, and move toward full sustainability through cost-recovery frameworks and long-term institutional support.