Research Project Impact Case Study

Infectious disease surveillance in Aotearoa

Research Title

Reviewing infectious disease surveillance in Aotearoa so that it better protects us from current and emerging threats

Key researchers
Prof Michael Baker[1], Assoc Prof Amanda Kvalsvig[1], Dr Celia Hume[1], Dr Nelly Renta[1] and Dr Sarah Pirikahu[1]

[1]Department of Public Health, University of Otago, Wellington

Te Niwha Research Project - Impact Case Study

Introduction

The goal of this project is "To ensure New Zealand (NZ) has a world-class surveillance system to support a highly effective response to important infectious disease threats." This goal is well aligned to the Te Niwha Mission.

This project aimed to advance infectious disease surveillance in NZ by documenting:

- The ID surveillance activities currently active in NZ

- The stakeholders of ID surveillance activities and their information needs

- Recommendations for improving and evaluating performance of such activities that would ensure world-class capability and capacity to support improved prevention, control, and preparedness for current and future ID challenges

Science excellence

We developed a novel framework for systematising the review of surveillance systems, including assessing their performance and whether the systems are meeting end user needs. Novel features of the surveillance sector review method include:

- Provides a systematic framework specifically designed for evaluating and improving public health surveillance.

- Considers the public health importance of events for surveillance using widely understood criteria including current incidence and prevalence, outbreak and pandemic potential, clinical severity, inequity, societal cost, controllability, and preventability.

- Identifies a full set of end users and their information needs, from the public and community leaders, through health practitioners, public health agencies, to local and national decision-makers and leaders and researchers with specific needs (including disease modelling and molecular diagnostics).

- Distinguishes control-focussed actions from strategy-focused actions which have different system requirements and performance attributes.

- Focusses on identifying upstream drivers of disease and injury events, notably their associated hazards, determinants, and interventions that may provide an improved surveillance base to inform and support prevention actions.

- Focusses on identify surveillance sector gaps, notably important public health events that have little or no adequate surveillance.

- Considers a set of issues that may be missed by evaluation of individual systems, notably integration of information from multiple systems.

- Identifies sector issues such as leadership, coordination, mandate, organisation, workforce and resources that affect multiple surveillance systems.

- Provides a more consistent way of describing surveillance methods across diverse types of health events which may assist translation of best practice and improved information quality.

The research team ran a well-attended interactive workshop at the Te Niwha Summit on 12-14 November 2025 to improve understanding of surveillance principles by sector worker. This workshop also helped to validate the assessment framework.

Outcomes

The main findings from our study show 125 discrete ID surveillance systems in 2025 with a major focus on respiratory infections. Infectious disease surveillance systems are well established in NZ for most infectious diseases, and the process is streamlined and efficient for many systems like the Notifiable diseases system. However, some other ID

surveillance systems function in a fragmented manner and in silos, with gaps and duplication of ID surveillance activities in some instances.

Since 2010, there has been an increase of 37% in ID surveillance systems with the increase seen across all functional categories. However, the ID surveillance still has an "ambulance at bottom of the cliff" approach. Close to half of ID surveillance systems are focused on disease (including health status, disease, injury and outcomes) as in 2010. Importantly, there are several areas lacking a focus on upstream factors – the hazards, determinants and interventions where preventive action can be taken. Establishing integrated surveillance in these areas would help support disease prevention actions.

During and after the Covid-19 pandemic NZ added several new ID surveillance systems especially for respiratory infections but there is still a lack of coordination and despite the increased number, there are still gaps in systems. For instance, there is no system that effectively captures respiratory infections in the community. It would be worthwhile to consider co-designing and evaluating an ID surveillance system with an approach that incorporates more end user needs.

Impact

This study identified the need for systems change to give NZ the surveillance systems it needs to protect its people and economy from current and emerging ID threats.

The major recommendation of this research is to complete the surveillance sector review by conducting the remaining stages which were not possible with the constrained scope of this initial review. In particular, the following steps:

- Clearly define the scope and purpose of ID surveillance in Aotearoa New Zealand. This process would include a review to identify the highest priority ID events for surveillance along with the key actions to control and prevent IDs.

- Review the information needs of a full range of end-users. This process would include a focus on public and community representatives of Māori, Pacific and marginalised population groups. Doing this would help to ensure ID surveillance systems are designed and operated in an equitable manner while maintaining data sovereignty.

- Systematically review the performance expectations of surveillance systems according to specific purposes and end-user requirement. And assess current and proposed systems against those standards to identify areas for systematic improvement.

- Review infrastructure needs for effective and efficient surveillance sector operation including strategic leadership, data systems, workforce, and specialised functions including analysis and communication of information.

- Identify how to improve integration of ID surveillance data from different systems to give a more comprehensive epidemiological picture of IDs, including the need to support a One Health approach and linkage of surveillance activities across Government sectors.

- Review how the ID surveillance system can build in flexible capability to scale up or down in response to new threats and opportunities, including supporting effective pandemic preparedness. .

Ultimately, high performing ID surveillance systems will contribute to multiple health, social, equity, and economic benefits. Such systems improve the speed, effectiveness and efficiency of managing ID outbreaks and wider epidemics and pandemics. They also support the improved safety of drinking water, food production systems, indoor environments and health care settings with consequent health and economic benefits.