Te Niwha

Research Project Impact Case Study

Improving models for pandemic preparedness and response: modelling differences in infectious disease dynamics and impact by ethnicity

Key researchers
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Introduction

The aims of the research are: (1) to develop models that are better equipped to support policy making for future pandemics or infectious disease threats; and (2) improve understanding of the drivers of inequities in infectious disease impact, e.g. vaccine coverage, clinical severity, contact rates. This will benefit disadvantaged populations by improving the ability of public health decision makers to develop policies to mitigate disease impact in these groups.

The research approach uses a combination of mathematical modelling and health data analysis. Key stakeholders includes Manatū Hauora (Ministry of Health) and the National Hauora Coalition. These have been extended to include the Ministries of Health in Niue and the Cook Islands, and the Statistics for Development section of the Pacific Community.

The project aligns with Te Niwha's mission by strengthening Aotearoa's research capability in infectious disease modelling, building Māori research capacity in this area, and improving our ability to use modelling to support the public health response to serious infectious disease threats.

Results

The main outcome of the project will be an infectious disease model for Aotearoa that stratifies the population into major ethnicity groups. The model will be calibrated to ethnicity-specific data for Covid-19.

This will serve as a tool for improving understanding of drivers of disparity in the impact of Covid-19 between ethnicities. It will also put us in a better position to use models to support the public health response to future pandemics, in particular to mitigate the disproportionate impact on vulnerable populations. The improved model will be able to help answer questions about the likely size of the disease burden in different ethnicities under different scenarios, and how this might be reduced with alternative control measure or policy options.

Impact

The impact of the research will be the availability of improved mathematical models that can be used to inform decision making and public health policy in response to future pandemics or infectious disease threats. This will address a key shortcoming of models that were used to inform government decision making during the Covid-19 pandemic. The improved model will enable decision makers to explore the likely impact of alternative policy options on different ethnicity groups. This will support a more nuanced public health policy response, and improve our ability to mitigate inequities in infectious disease impact.

The pathway to impact is via ongoing dialogue with stakeholders at Manatū Hauora and Te Pou Hauora Tūmatanui (Public Health Agency), who have extensive experience of collaborating with infectious disease modellers (including members of the research team) to provide modelling results to inform policy decisions.

In future, the results of this research could be used to provide a set of quantitative scenarios for potential future pandemic threats to support pandemic preparedness, planning and real-time decision making. This aligns with some of the recommendations of the phase I report of the Royal Commission of Inquiry into Covid-19.

Ultimately, this research will help improve health and wellbeing and reduce the impact of future infectious disease threats on disadvantaged groups.