

Lockdowns and other measures still needed after New Zealand re-opens its borders

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A major study of health outcomes finds a highly effective vaccine and high total uptake will be required to help mitigate high numbers of COVID-19 cases, hospitalisations and deaths once New Zealand borders are reopened.

COVID-19 [vaccine](#) strategies for Aotearoa New Zealand: a mathematical modeling study led by Prof. Colin R Simpson (Victoria

University of Wellington), in collaboration with the Institute of Environmental Science and Research (ESR), of the potential effect of New Zealand's vaccination program when borders reopen has been published in *The Lancet Regional Health—Western Pacific*.

The modeling looked at various hypothetical scenarios. One scenario predicted that with 10 overseas cases daily and 90% total population vaccine uptake (including zero- to 15-year-olds) with the same vaccine and the targeting high-risk groups, there would be an estimated 11,400 total hospitalisations (peak 324 active and 36 new daily cases in hospitals), and 1,030 total deaths. The modeling is based on a two-year open-border scenario and without public health controls.

The paper suggests a [strategy](#) targeting vaccination of high-risk groups will result in lower hospitalisations and deaths, but a higher number of cases compared to a strategy targeting reduced transmission. The modeling excludes the impact of public health controls, including lockdowns, and therefore predicts a greater number of cases.

Prof. Colin R Simpson says the predictions from different vaccination program strategies that were modeled to consider the number of cases, hospitalisations, and deaths over two years with open borders could help support New Zealand's vaccination strategy.

"The aims of the study were to predict how many people do you need to immunize for herd immunity, which age groups should be targeted first and in what order and what the number of cases, hospitalisations and deaths would look like under a number of different vaccine effectiveness, R_0 and population coverage".

The modeling found that reaching herd immunity threshold (HIT) based on the infection rate of the Delta variant was almost impossible.

"Based on a 90% Vaccine effectiveness (VE) against disease and 80% VE against infection we would require at least 86.5% [total population](#) uptake (including children) for $R_0=4.5$ (with high vaccination coverage for 30–49-year-olds) but that would jump to 98.1% uptake for $R_0=6$ (the Delta variant)" said Prof Simpson.

ESR Chief Scientist Dr. Brett Cowan says the results show that vaccinating as many New Zealanders as possible will reduce the risk of widespread community outbreaks and, as a result, vulnerable populations will have a greater chance of protection from severe disease. But other public health and social measures will still be required as part of an effective pandemic response.

"Vaccination modeling has been proved to help anticipate potential public health outcomes based on different vaccine effectiveness reported in [clinical trials](#) and 'real-world' studies and vaccination program strategies. While the study was primarily developed with New Zealand in mind, our experience will also provide valuable insights to the international community to inform future actions. "

Andrew Sporle, Department of Statistics, The University of Auckland says it was critical to include strategies to ensure maximum protection for Māori and Pasifika, who are at higher risk for hospitalization and death from COVID-19.

"Prioritizing vaccinations for those most at risk of severe outcomes from COVID-19 infection (including Māori and Pasifika) benefits the whole population as well as protecting those groups. We know that opening the border will result in local cases of COVID. Minimizing the resulting hospitalisations and deaths requires prioritization of those groups and communities most at risk, as Australia and Canada have done. The risk of a border breach before our vaccination delivery is complete means that prioritization must be a focus of the vaccine roll-out and not a catch-

up strategy."

More information: Trung Nguyen et al, COVID-19 vaccine strategies for Aotearoa New Zealand: a mathematical modelling study, *The Lancet Regional Health - Western Pacific* (2021). [DOI: 10.1016/j.lanwpc.2021.100256](https://doi.org/10.1016/j.lanwpc.2021.100256)

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