Below is the full list of funded recipients from the Health Research Council of New Zealand's rapid response COVID-19 funding rounds.

2020 COVID-19 New Zealand Rapid Response Research

(Request for Proposals funded by the Ministry of Health and Health Research Council)

Ms Lesley Gray, University of Otago
Improving effectiveness and equity in the operation of COVID-19 'self-isolation'
$179,904
Lay summary
Self-isolation and quarantine have become a key part of New Zealand's border controls and containment strategy against COVID-19. However, we have very little information on public understanding of these measures and adherence with these critical interventions. There are also likely to be ethnic and socioeconomic inequalities in the ability of people to follow these guidelines. This research will use mixed-methods to provide a comprehensive picture of the operation of isolation measures in NZ, including a population-based sample of people registered with Healthline for self-isolation to assess knowledge, attitudes and practices regarding isolation measures. This research addresses critical knowledge gaps by identifying actions taken, and factors influencing individuals' understanding of and ability to comply with advice to self-isolate. Findings will be fed back rapidly to the Ministry of Health to support immediate improvements in how self-isolation is managed.

Dr Colin McArthur, Medical Research Institute of New Zealand
Clinical trial of COVID-19 treatments for the critically ill
$169,571
Lay summary
An existing study evaluating multiple treatments for severe pneumonia ('REMAP-CAP') is currently active in over 70 ICUs worldwide, including 10 sites in New Zealand. Severe pneumonia is the most common cause of death from COVID-19, but there are currently no known effective treatments for COVID-19. In conjunction with our international collaborators, we will add the assessment of some drugs with potential antiviral activity (lopinavir/ritonavir and hydroxychloroquine) and treatments that modulate the body's immune response (anakinra and interferon beta 1a), which in severe cases is thought to further damage the lungs. This study has a special adaptive design which allows the results from around the world to be analysed as frequently as every week, which are then used to immediately increase the proportion of participants who are allocated the treatments more likely to be effective. Assessment of other potential treatments can also be added quickly in the future.

Dr Marama Muru-Lanning, The University of Auckland
Harirū, hongi and hau in the time of COVID-19
$101,922
Lay summary
Kaumātua have important leadership responsibilities and enacting them in the context of COVID-19 will place them at increased risk. For this project, we will initiate an innovative

dialogue using digital means with kaumātua and kuia around their concerns and reactions to COVID-19. We aim to discover how older Māori understand the tapu of the body and bodily fluids and how they are navigating the spread of viral transmission, in light of rapidly evolving advice and regulations regarding personal distancing (harirū, hongi and hau), self-isolation, and gatherings. We will use mobile (tablet) technology to communicate on a regular basis over six weeks with kaumātua in Ngātiwai and Waikato with whom we have well-established links. Discussion of our findings with participants in ongoing dialogue will lead to guidance for policy-makers and public health in supporting Māori communities, and may also chart ways for future kanohi-ki-te-kanohi research.

Professor Ilan Noy, Research Trust of Victoria University of Wellington
Economic risks from COVID-19 in Pacific Island Countries
$51,436
Lay summary
We measure the overall economic risk that is associated with COVID-19 in Pacific Island Countries (PICs). Based on work developed in Noy et al. (2019) but re-designed to fit the epidemiological details of COVID-19 and the specific circumstances of the Pacific, our approach is to evaluate where the economic risks of COVID-19 are currently concentrated in the different countries, different sectors, and where possible, within countries in the region. We measure the different exposures, vulnerabilities, and resiliences that can be identified in each country. In addition, using a DALY-like index for economic risk presented in UNISDR (2015) and implemented for other risks in the Pacific in Noy (2016b), we also aim to provide a more comprehensive analysis of the risk associated with COVID-19 in the region as measured by lost 'life years', a measure that includes both the public health and the estimated economic consequences of COVID-19.

Dr Olin Silander, Massey University
Rapid diagnosis and genome sequencing to follow CoV-2019 outbreak
$165,471
Lay summary
Rapid diagnosis of SARS-CoV-2 is critical for slowing the spread of the virus. Here we propose developing streamlined protocols for virus detection and genome sequencing. We will develop protocols that allow viral detection using qRT-PCR from patient samples using field kits for rapid RNA isolation. We will implement this protocol on the portable Ubiquitome Liberty16 qPCR platform. We will develop protocols to detect virus in pooled samples to increase assay throughput. We will also perform genome sequencing using the inexpensive, real-time Oxford Nanopore Flongle DNA sequencing platform. Finally, we will integrate the genomic sequence data from the New Zealand samples into the context of samples worldwide by leveraging the NextStrain nCoV-2019 database. We aim to be able to enable a single person to screen more than 500 samples per day and obtain up to 24 whole genome sequences per day.

Associate Professor Jo-Ann Stanton, University of Otago
An effective point-of-care screening pathway for COVID-19
235,746
Lay summary
We will develop a test and workflow in partnership with rural Māori communities and primary

care providers to screen patient samples for COVID-19 at the point-of-care (e.g. doctors' clinics, airports). If robust, this is a front-line triage tool. The work focuses on RNA extraction from swabs followed by qPCR and/or direct RNA sequencing to detect viral presence. Our approach uses Oxford Nanopore Sequencing and the PDQeX, a nucleic acid extraction technology; both are compatible with point-of-care settings. Data will be compared to a curated database and will be available for downstream phylogenetics analysis to understand COVID-19 transmission in New Zealand. We will build a bioinformatics pipeline to pass front-line data to colleagues in the Webster Centre, University of Otago. Our findings and innovations will be disseminated broadly. This work can start immediately. Team members developed the PDQeX and demonstrated proof-of-concept for virus detection under extreme environments.

2020 COVID-19 and Emerging Infectious Diseases Grant
(Researcher-initiated proposals funded solely by the Health Research Council)

Professor Michael Baker, University of Otago
COVID-19 Pandemic in Aotearoa NZ: Impact, inequalities & improving our response
$500,000
Lay summary
The goal of this project is to guide an effective and fair pandemic response in Aotearoa New Zealand. Experience from overseas demonstrates the profound impact of the COVID-19 pandemic on populations. The pandemic has potential to worsen health inequalities because people with existing health conditions (common in Māori and Pasifika) are more likely to become severely ill. However, large-scale measures to control the spread of the virus are likely to have the worst impact on those who can least afford it. To avoid these harms, our team of experts will provide ongoing analysis of information from multiple sources about pandemic impact and the lived experience of those with the infection and their whānau. We will rapidly communicate these insights to decision-makers at the Ministry of Health, service providers, communities, other Pacific nations, and the public in the form of practical recommendations to guide current and future pandemic responses.

Professor Richard Beasley, Medical Research Institute of New Zealand
Clinical trial of hydroxychloroquine prophylaxis in frontline healthcare workers
$429,500
Lay summary
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) continues to spread internationally. COVID-19 is placing unprecedented pressure on the global healthcare workforce and many healthcare workers have been infected. In Italy, for example, almost 1 in 10 infections have occurred in healthcare workers. Preventing infections in healthcare workers has been identified as a key strategic objective by the WHO and is vital for health services that are likely to be faced with unprecedented demand. Hydroxychloroquine is active against SARS-CoV-2 in vitro. It has an established role in malaria prophylaxis with weekly dosing and costs 8 cents per tablet. We plan a randomised clinical trial that will evaluate the role of hydroxychloroquine for SARS-CoV-2 prophylaxis in front-line healthcare workers. The primary end point will be laboratory-confirmed SARS-CoV-2. The trial will start if the number of cases of COVID-19 increases in New Zealand from the current levels, and will involve a range of frontline healthcare workers.

Dr Liangni Liu, Massey University
Social response to COVID-19 in New Zealand: Obligations and stigmatisation
$350,325
Lay summary
The proposed research will investigate the social response to the presence of COVID-19 in New Zealand. It is two-fold. Firstly, the research will explore the quarantine and isolation practices and experience of individuals and communities at risk to identify the strength and/or vulnerability of NZ when dealing with quarantine and management measures. This phase of the research will provide practical benefits to help establish a robust system to better deal with a possible global infectious disease outbreak in the future. Secondly, the research will focus on disease-related risk perceptions, communication and reactions among identified communities at risk and the NZ general population. This phase of the research will address the social, cultural, political and racial dimensions that shape the NZ public's attitude towards the outbreak of pandemic diseases, which has significant implications for the success of building cultural solidarity to battle severe infectious diseases.

Mr John Mackay, Dnature Diagnostics & Research
Distinguishing COVID-19 from influenza with rapid 15-minute diagnostics
$196,570
Lay summary
Diagnostic testing is critical for the containment of COVID-19 and other infectious diseases. Due to the current complexity of the tests and thus capacity limits, testing is typically limited to those meeting certain threshold criteria. In addition, test results may take up to 48 hours to be returned to parts of New Zealand by the time samples reach the lab, the work is completed, and the results returned. Therefore, the danger exists that a disease will spread faster than the testing can help isolate positive cases. This work aims to develop rapid (15-minute) molecular diagnostics that can be performed anywhere without the need for DNA instrumentation. Results will be collected and reported centrally via a smart phone app for further follow-up and confirmation. Such a method will be amenable to any new virus to ensure rapid and consistent diagnostics can be performed anywhere in New Zealand within a short time-frame.

Dr Susan Morpeth, Middlemore Clinical Trials
Australasian COVID-19 Trial (ASCOT)
$766,113
Lay summary
ASCOT is an open label randomised controlled trial of unproven treatments for pandemic coronavirus infection among people unwell enough to need admission to hospital, but not so unwell that they need intensive care. Consenting participants will be randomised to either lopinavir-ritonavir (an anti-viral used to treat HIV), hydroxychloroquine (used in autoimmune diseases), both of these agents in combination, or the current standard of care. The study will be carried out at multiple sites across Australia and New Zealand. We will see whether either or both of these potential treatments will reduce the risk of needing intensive care or risk of death from pandemic coronavirus infection.

Professor Anthony Phillips, The University of Auckland
Attenuating lung injury during prolonged ventilation for COVID-19
$161,977
Lay summary
The current COVID-19 infection pandemic is requiring prolonged ventilation support in many patients. We have a therapy (repurposed drug) expected to reduce lung injury in these clinical circumstances. This study will provide key initial experimental data for this indication to then support a decision to re-manufacture the drug and use it in a COVID clinical trial.

Professor Colin Simpson, Research Trust of Victoria University of Wellington
Predict and Prevent COVID-19: a data driven innovation project
$533,224
Lay summary
The study of how infectious diseases like COVID-19 spread and how well public health interventions and therapies work is suboptimal. The main data come from reports about where people with disease are located, when they first became sick, and how many required hospitalisation. Increasingly, viral genetic samples are collected which can help to estimate how fast the virus is spreading and reveal who infected whom. We aim to create technical solutions that will address the challenges with existing methods. Using cutting-edge techniques including machine-learning and improved phylodynamics, we will develop methods to combine modern sources of detailed data. We will create new approaches to use genomic data to understand the spread of this disease through the population and incorporate new data in near real-time. We will use detailed human movement and location data to independently model the structure of the population.