

Six innovative Trinity research projects to wage war on COVID-19

Six Trinity researchers have been successful in securing state funding for vital research into COVID-19 and the implications of the disease on the health and well-being of our nation and on our health service and public health decisions.

The Health Research Board (HRB) in cooperation with the Irish Research Council (IRC) launched the COVID-19 Rapid Response Call in March to fund research to provide evidence for the national and global efforts to deal with the virus outbreak. The funding process was a highly competitive one and the awards received by Trinity investigators acknowledge the excellent standard of research, innovation and expertise at the university, to tackle the COVID-19 disease.

The Trinity research will provide an invaluable contribution to the national effort to better understand COVID-19 and protect our communities. The six projects will investigate the effect of COVID-19 on: older people's health; public health interventions; the use of telemedicine systems for vulnerable groups, those with systemic autoimmune disease and estimate the scale of the prevalence of the disease.

Prof. Linda Doyle, Dean of Research, Trinity College congratulated the recipients saying:

"This funding programme is an example of how vital research is to the health of our nation, and truly shows that research matters for all of us. The rapid response our researchers have shown to the current crisis is an example of the strength and depth of talent and expertise that is available in Ireland to address the challenges we face from COVID-19.

"I am proud to see Trinity's researchers answering the call with a series of innovative projects and I congratulate Catherine Comiskey, Orla Hardiman, Catherine Darker, Nollaig Bourke, Rose Anne Kenny, and Mark Little, and all of our colleagues across the sector who have secured funding. This talent, agility and creativity, combined with our researchers' desire to harness their expertise for the greater good, will undoubtedly play a strong role in the next phase of this challenge."

The successful projects awarded are:

1: Title: SABS-TILDA: SARS-CoV-2 specific AntiBodies in The Irish Longitudinal Study on Ageing (TILDA): an opportunity to assess COVID-19 rates and phenotypes in older adults in Ireland

Principal Investigator: Dr Nollaig Bourke, Dept of Medical Gerontology, School of Medicine. Trinity Translational Medicine Institute (TTMI), St. James's Hospital

Watch: You can view Dr Nollaig Bourke's synopsis of this research project [HERE](#).

Dr Bourke and her team will investigate the ‘who’ and ‘why’ of COVID-19 in older people in Ireland. They will investigate which participants of the Irish Longitudinal Study on Ageing (TILDA) were infected with the disease by measuring virus specific antibody levels and will explore what risk factors are associated with disease, including analysis of how the immune system is activated in these individuals.

Dr Nollaig Bourke said:

Older people in Ireland are disproportionately affected by COVID-19, so it is really important that we have accurate national rates of infection in this population (including asymptomatic individuals). It is also very important that we understand who got sick and why, so by doing our proposed in-depth research into risk factors associated with COVID-19 disease in older people in Ireland, including detailed analysis of their immune system, we will potentially be able to explain why someone might be more likely to experience severe COVID-19 disease. This would potentially help us identify high risk individuals, as well as reveal what parts of the immune system would be best to target therapeutically in individuals.

2.Title: Creating an evidence-based toolbox for targeted public health interventions during COVID-19: a cross-border analysis to disentangle psychological, behavioural, media and governmental responses.

Principal Investigator: Professor Catherine Darker, Associate Professor of Health Services Research, (interim) Head of Discipline, Public Health & Primary Care.

Watch: You can view Professor Catherine Darker’s synopsis of this research project [HERE](#).

Professor Darker and her team will produce an evidence-based toolbox for targeting of public health and political leadership in terms of messaging and measures for any further waves of COVID-19, and subsequently for future epidemics/pandemics. The team will explore the implications of COVID-19 on two very similar populations in two different governments and public health jurisdictions (Republic of Ireland (ROI) and Northern Ireland (NI)). As part of the research the team will investigate the spread of (mis)information and the key behavioural, social and psychological factors of the disease.

Professor Catherine Darker said:

“COVID-19 is one of the biggest threats to public health in a generation. On the island of Ireland there are two different governments and public health jurisdictions. This represents a unique opportunity to explore the implications of different measures and messaging across these two jurisdictions as they relate to this virus on two similar populations. Arising from this research we will produce a public health toolbox that will guide both public health and political leaders for any further surges of COVID-19 or indeed for future epidemics or pandemics.”

3.Title: Using Telehealth to enhance management of vulnerable groups during the COVID-19 pandemic.

Principal Investigator: Professor Orla Hardiman BSc, MD, FRCPI, FTCD, MRIA. Professor of Neurology, Trinity College Dublin, Consultant Neurologist, Beaumont Hospital, HSE Clinical Lead in Neurology.

No video is available for this research project.

Professor Hardiman and her research team will implement, evaluate and modify a new patient/caregiver-oriented telemedicine system developed by their collaborators in Sheffield University, to provide immediate virtual support for those with Motor Neuron Disease (MND) and Frontotemporal Dementia (FTD) and related conditions. They will examine the strengths and opportunities for modification of this system, tailoring it to enhance care for Irish patients and their families.

Professor Orla Hardiman said:

“The COVID-19 pandemic has made patients and their families reluctant to attend their GPs or visit the hospital, creating a high risk of patients experiencing untreated complications of their condition, and breakdown of care that is usually provided by family members and community-based services. Remote and accurate tracking of clinical symptoms, early recognition of new symptoms and timely home-based visits are very important. The telemedicine system will allow us to efficiently monitor people in real time, and deploy team members to those most in need, allowing continuation of high-quality patient centred care despite the limitations posed by COVID-19.

In the longer term, this telemedicine system will be adjusted to improve how care is provided between the hospital and the community services to improve the experience of patients and their families.”

4.Title: Using a back-calculation model to estimate the scale of asymptomatic Covid-19 prevalence by age and determine the critical threshold of available susceptible persons within the community.

Principal Investigator: Professor Catherine Comiskey, Professor in Healthcare Statistics, School of Nursing and Midwifery.

Watch: You can view Professor Catherine Comiskey’s synopsis of this research project [HERE](#).

This research will use mathematical models to estimate the levels of asymptomatic infections, and this will help to inform planners and policymakers about a possible second epidemic and when and how Ireland can ease social restrictions related to COVID-19.

Professor Catherine Comiskey said:

“With this project we plan to provide an estimate of the number of people who may have had COVID-19 and do not know they have had it. These are called the asymptomatic cases. Knowing how many people had COVID-19 and their ages will help policy makers make safer decisions on reopening our communities.”

5. Title: Defining the disease course and immune profile of COVID-19 in the immunosuppressed patient (DeCOmPRESS study)

Principal Investigator: Professor Mark Little, Professor/Consultant of Nephrology, Clinical Medicine, School of Medicine.

Watch: You can view Professor Mark Little's synopsis of this research project [HERE](#).

The aim of the research project is to define the course of SARS-CoV-2 infection in patients with systemic autoimmune disease, and to determine if COVID-19 is more or less severe in these immunosuppressed patients.

Professor Little and his team will better understand how the immune system responds to the virus and assess whether immunosuppressive therapies could be used to treat COVID-19. It will also assist in providing clear guidance to patients with respect to cocooning and current use of immunosuppressant medication.

Professor Mark Little said:

"The DECOMPRESS project will determine the outcome of patients taking immunosuppressive medication who contract SARS-CoV2. This will allow us to target accurate advice regarding cocooning to these patients, and to inform development of new therapies and biomarkers. Conventionally, we assume that, when the immune system is suppressed, the ability to fight infection is impaired. While this is certainly true generally, these medications may actually protect against the "cytokine storm" that characterises severe COVID-19. The project will build on work in the Irish Rare Kidney Disease registry and biobank, and will incorporate six clinical research facilities around Ireland, a dedicated smartphone app developed by patientMpower, the immunology expertise of St James's Hospital and the data integration capability of the ADAPT SFI centre."

6. Title: Altered lives in a time of crisis: Preparing for recovery from the impact of the COVID-19 pandemic on the lives of older adults.

Principal Investigator: Professor Rose-Anne Kenny, The Irish Longitudinal Study on Ageing (TILDA) at Trinity College.

Watch: You can view Professor Rose-Anne Kenny's synopsis of this research project [HERE](#).

Older persons are most likely to experience severe and critical consequences of COVID-19 including death. The ability to mount an immune response declines with age. Understanding immunosenescence (the gradual deterioration of the immune system brought on by natural age advancement), its relationship to COVID-19 and therefore its impact on future vaccination responsiveness is a priority. Because TILDA has comprehensive data collected at regular periods for the past 10 years the research team can explore how immune profiles and other biological and social factors change over time and which changes enhance an individual's vulnerability to infection.

Professor Rose-Anne Kenny said:

"The measures which have been introduced as a result of COVID-19 have particularly impacted on the lives of people over 70. The research will further enquire about the impact of these policies on mental and physical health and hear the voice and views of those most

affected. This is important if we are to understand and manage the collateral damage from COVID-19."