

Statement to Inquiry into the Commonwealth Government's response to the COVID-19 Pandemic, from the Peter Doherty Institute for Infection and Immunity

Introduction

The Peter Doherty Institute for Infection and Immunity (the Doherty Institute) is an unincorporated joint venture between the University of Melbourne and the Royal Melbourne Hospital, combining research, education and public health in infectious diseases and immunology.

The Doherty Institute incorporates research in fundamental science, clinical research and epidemiology and is home to reference laboratory services, diagnostic services, and clinical care for all infectious diseases. The Doherty Institute played a major role in Australia and the Asia-Pacific region's response to COVID-19. Our submission highlights key areas of our involvement and key lessons learnt.

Our response

The Doherty Institute sits at the forefront of the global response to infectious diseases, through international networks and existing capacity in infectious disease identification, monitoring, and management. The Institute is a first responder to any outbreak in Victoria, Australia, and across our Region. Examples of this capacity are provided below:

The Victorian Infectious Diseases Reference Laboratory (VIDRL) and the Microbiological Diagnostic Unit Public Health Laboratory (MDU-PHL), located within the Doherty Institute, were instrumental in the roll out of COVID-19 testing and genomics at a state and national level. VIDRL led the development of a diagnostic test within days of the announcement of the sequence of SARS-CoV2 in January 2020 and shared this expertise across Australia; was the first lab outside of China to grow the virus *in-vitro*, sharing it with other laboratories nationally and internationally; and provided technical assistance to the development of the National Testing Framework (Commonwealth funded). MDU-PHL significantly contributed to the development of whole genome sequencing (genomics) testing and analysis, including development of the AusTrakka platform, which serves as Australia's national genomics surveillance system. Both laboratories developed and validated innovative testing techniques such as saliva samples, point of care tests and mobile laboratory testing.

Utilising our notable epidemiological and mathematical capacity, we worked closely with the Federal Government to develop modelling scenarios, to support and inform public health response and action, protecting Australians from excess transmission and reducing long-term subsequent health impacts. These models played a key role in informing various national policy interventions, including travel restrictions, quarantine, and mask wearing, alongside national hospital utilisation and disease control. The advice was based on international best practice, and directly informed decisions by the Australian Health Protection Principal Committee (AHPPC) and National Cabinet.

The Doherty Institute also led significant research activity into COVID-19, its transmission, and treatments. This included:

- Leadership of APPRISE, an NHMRC-funded Centre of Excellence, to improve Australia's response to infectious disease emergencies, including the First Few Hundred studies and administration of a national indigenous network to respond to COVID-19.

- Basic research studies including the first to describe the immune response to COVID-19 as a result of pre-approved protocols in place to study any new infectious disease (SETREP-ID) and ongoing assessment of the immune response to vaccination, including in vulnerable populations.
- Evaluated existing therapeutics as antiviral agents and developed novel platforms for therapeutic development including the use of human organoids.
- Leadership of a national platform trial for hospitalised patients, the ASCOT Clinical Trial.
- Supported COVID-19 vaccination development, in conjunction with the CSIRO and the University of Queensland. Development of three novel vaccines, including one reaching phase 1 evaluation.
- The DISCOVER project, to understand risk factors for health-worker acquired infections, and potential preventative measures that can be implemented.
- The Optimise Study, run in conjunction with the Burnet Institute, a longitudinal cohort study to follow COVID-19 diagnosed people, their close contacts, and the community.
- MRFF-funded COVID-19 genomics program, to coordinate and support SARS-CoV-2 genomic sequencing and analysis nationally, and evaluation of Australia's national genomics approach.
- Leadership of the National COVID Health and Research Advisory Committee and WHO Advisory Committee on COVID-19 vaccine selection, membership of ATAGI, AHPPC, CDNA and many other Victorian and national advisory bodies.

Lessons Learnt

From our extensive experience we highlight the following key lessons learnt and areas for further focus.

Surveillance and Data

- Ongoing investment in national integrated surveillance systems, and specialised modelling and epidemiological capability that can be readily applied in public health emergencies, coordinated through the newly established Australian Centre for Disease Control (ACDC) is required.
- National sharing of genomic data and coordinated national analysis using secure platforms such as AusTrakka with clearly defined governance agreements, roles and responsibilities for Commonwealth and State Government and Public Health Laboratories to ensure effective interpretation and application of the data to public health responses.

Public health testing and outbreak response

- National supply chain management to ensure equitable access to testing consumables.
- Ongoing investment to maintain a highly skilled public health laboratory workforce with technical skills, surge capacity, institutional relationships, and specialised equipment/facilities to ensure capability and capacity for pathogen agnostic diagnostics and outbreak responses.

Vaccines, therapeutics, and clinical trials

- Linkages between public health laboratories, clinicians, and researchers to ensure rapid applied research for public health responses.

- National adaptive platform trials to rapidly generate new evidence for immunological and host responses and therapeutic interventions for infectious diseases. Additional capacity is needed for community based therapeutic trials.
- Improved vaccine evaluation through clinical trials from phase 1 to 3.
- Improved supply chain management for novel vaccines and therapeutics.
- Identification of novel therapeutics at speed.

Expert advice and guidance

- Development of a national network of trusted scientific and public health communication experts to guide community engagement and public messaging.

Research

- Strategic funding of research that galvanise large scale collaborative programs with the potential for high impact, in preference to competitive research that support small teams that work in isolation.
- Funding for research platforms that extend across relevant pathogens to support responsive research to pandemics e.g. pre-approved protocols, streamlined ethics approvals, data sharing mechanisms and biobanks.
- Consolidation of a trusted network of research institutes that can be rapidly activated to conduct rapid research translated into public health policy and action.
- Investment in monitoring and evaluation studies that assess both the effectiveness of the program and the impact of its outputs on pandemic preparedness and response.
- Framework for national sample transfer to enable expanded research capabilities nationally (e.g. isolates of new variants were not able to be quickly shared across jurisdictions).
- Lack of animal PC3 facilities delayed research. Australia requires more PC3 facilities for animal and human research to be available and supported by a trained workforce.
- Investment in Human Challenge models as a core platform for pandemic preparedness.

The Doherty Institute, along with the University of Melbourne and the Burnet Institute, is a founding member of the Australian Institute for Infectious Disease (AIID). This new Institute will house the largest critical mass of scientists and public health professionals in the Southern Hemisphere, coupled with state-of-the-art technologies and industry partnerships needed to protect Australia and the Asia-Pacific region from global health issues. The establishment of the AIID will contribute to several critical infrastructure and capability gaps identified in our response to COVID-19, in conjunction with identified improvements from this Inquiry.