

Kirby Institute Annual Report 2021



The Kirby Institute is a world-leading health research institute at UNSW Sydney.

We work to eliminate infectious diseases, globally. Focused in Australia and the Asia-Pacific region, our work improves and protects human health, wellbeing and ability to thrive.

FRONT COVER PHOTO, TOP:
CREDIT: Tammy Gibbs

FRONT/BACK COVER PHOTO, BOTTOM:
CREDIT: Conor Ashleigh

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The Kirby Institute at UNSW Sydney is located on the Traditional Lands of the Bidjigal Peoples.

We acknowledge the Traditional Owners of Country throughout Australia, and Aboriginal and Torres Strait Islander people's continuing connection to culture, land, sea, waters, and community. We pay our respects to Elders both past and present.

Message from our Director

Professor Anthony Kelleher



Pandemics are not short-lived beasts. COVID-19 is no exception. 2021 presented new challenges as the pandemic evolved, but also saw tremendous scientific progress. It has been an enormous feat by the global community to develop and begin to administer a vaccine for a novel virus, and millions of lives have been saved as a result. But the inequity in vaccine distribution across the world has inevitably led to the virus mutating. The variants of 2021 have reminded us that the pandemic is far from over.

Throughout 2021, I have been extremely proud of the achievements of the Kirby Institute's staff and researchers. In the laboratory, our researchers were among the first to grow the COVID-19 variants as they emerged, which enabled them to characterise the potential impacts on vaccine efficacy. This, combined with elegant insights from our mathematical modellers, who predicted the timing of the waning immunity of vaccines, has not only contributed significantly to the understanding of the virus and the efficacy of both the natural and vaccine-induced immune defenses, but critically, has also informed national and global policies on vaccine scheduling.

Our Institute's leadership on COVID-19 research extends to the clinic, with our clinical research teams providing leadership within large consortia conducting global clinical trials of potential therapeutics. Locally, we have conducted seminal studies to identify and understand the drivers of long COVID. Our researchers have also worked with local Aboriginal and Torres Strait Islander communities and health services to deliver point-of-care testing to over a hundred remote communities. This high-quality diagnostic service, embedded in communities, was maintained even during the height of the Delta and Omicron waves.

Whilst responding to the pandemic, our broader infectious diseases research has not stopped. Highlights that you will read in this report include the results of a major five-year study investigating the impact of expanding hepatitis C testing in the prison system; the sustained impact of our landmark EPIC-NSW study, which saw HIV transmissions continue to decline since PrEP was made broadly available to those at risk; and our expansion into capacity building in the IndoPacific region, with colleagues from a number of institutions. We also report innovations in point-of-care testing, which include a major scale-up of hepatitis C testing to bolster elimination efforts, as well as a large program exploring the role of these tests in the management of a number of infectious diseases that will be rolled out in remote Aboriginal communities.

This year, we were fortunate to host Aboriginal and Torres Strait Islander cultural awareness training for our staff. This initiative, championed by our Manager, Aboriginal and Torres Strait Islander Health Research, Robert Monaghan, is one of a suite of initiatives that we are implementing across the Kirby Institute to enhance our cultural literacy both within our institute, our research, and more broadly into our lives.

Thirteen of our PhD students completed their studies in 2021, and although most graduation ceremonies were cancelled, we proudly acknowledged their significant achievement in obtaining their PhDs while studying and working in highly challenging circumstances. Almost as many started their PhD studies in 2021, many commencing this journey whilst still in their home countries due to travel restrictions. Through drive, ambition and persistence they have made good progress despite the barriers.

Whilst we were once again physically distant for much of 2021, the dedication and passion of our researchers did not waver. What this period has also shown us is the important role of collaboration across and within sectors. We embrace both the new partnerships that have been forged, and our existing partnerships that have been enhanced by the challenges of the pandemic. I hope you enjoy reading about the breadth of achievements of the Kirby Institute in this 2021 Annual Report.

A handwritten signature in black ink, appearing to read 'Anthony Kelleher'.

Message from our Patron

The Honourable Michael Kirby AC CMG



The year 2021 saw the Kirby Institute contributing leading research in the midst of the second year of the worldwide COVID-19 pandemic. It has made important scientific discoveries and contributed to global knowledge about this disease. Many of the lessons learnt in the early days of the HIV/AIDS pandemic have been adapted and applied to addressing the COVID-19 pandemic.

We started 2021 with the hope that the new pandemic was under control in Australia and beyond. Sadly, infectious diseases have a habit of evading human control. With COVID-19, the Delta and Omicron variants emerged and spread rapidly, including in Australia. This thrust us all back to a state of uncertainty. Nevertheless, the Kirby researchers were at the ready. Once again, they adapted to the evolving situation. They conducted critical research in the laboratory and clinic, whilst at the same time providing evidence-based, reasoned and influential commentary to assist accurate public understanding, including through the media. During a time when fear and misinformation was rife, it has been reassuring to have a steady stream of commentary from such leaders of the Kirby as Anthony Kelleher, Gregory Dore, Gail Matthews, Miles Davenport, Stuart Turville, John Kaldor, Deborah Cromer, Raina MacIntyre and others. I congratulate and thank them all.

The Kirby Institute's research in other areas of science and healthcare has forged ahead. The Kirby has a long and proud history of working with vulnerable and at-risk communities in Australia and its region. In 2021 it continued this important work, with notable achievements in Indigenous health, global and regional health and drug user health. At the core of the Institute's values is a commitment to overcoming challenges arising from health inequity. Our researchers work with vulnerable communities, and with the general community, to save lives and improve the quality of life for many thousands. In turn, this work helps to improve healthcare for all – a basic human right.

These values are precious and were established in the Kirby in the earliest days of the HIV pandemic. Two of the scientific and clinical leaders of the global community in those early days were the late Professor David Cooper AC, inaugural Director of the Kirby Institute and Dr Anthony S. Fauci, Director of the National Institute of Allergy and Infectious Diseases of the United States and Chief Medical Advisor to the US President. It was therefore appropriate that the inaugural lecture to honour Professor David Cooper was given by Dr Fauci. He spoke of the vision that he shared with Professor Cooper of effective healthcare and meaningful investment in research, evolving from the earliest days of HIV/AIDS.

Networks that Dr Fauci and Professor Cooper established in those early days continue today. They have been critical to the task of getting global COVID-19 research up and running when that new pandemic emerged unexpectedly in 2020. The inaugural lecture by Dr Fauci provided a worthy testament to David Cooper's worldwide reputation and influence. He remains a source of pride and inspiration for all of us in the Kirby, working under our new Director, Professor Anthony Kelleher.

As with the HIV epidemic, cooperation across sectors and institutions has been the critical factor in our effective national response. How to maintain the energy and effectiveness of our collaborative efforts as we return to a new normal is the challenge that lies ahead. Only through collaboration is the full potential of Australian research realised.

I present this report with a sense of pride, and with great hope for the future. I do this in the knowledge that many brilliant minds are working at the Kirby Institute to create a healthier and more equitable world for all.

A handwritten signature in black ink, appearing to read 'Michael Kirby'.



We fight disease by spreading solutions

Infectious diseases work by spreading through individuals, communities and populations. At the Kirby Institute, we deliver solutions the same way. As a world-leading health research organisation, we focus on putting communities at the heart of our research. That way, we are better able to design tests, treatments and cures that have the greatest chance of success, helping us to eliminate infectious diseases globally.

We discover, develop, implement, and evaluate solutions to infectious diseases. What makes these solutions unique is that they are designed to be scaled for maximum impact across diverse communities, populations, and regions.

We do this via a highly successful, three step approach:

1. **Understanding:** the impacts of infectious diseases in individuals and populations.
2. **Intervention:** an holistic approach to developing, testing, and evaluating new strategies to prevent and treat infectious diseases.
3. **Implementation:** a consultative approach to working with affected and at-risk communities to deliver evidence-based health solutions.

Equality drives us

Infectious diseases disproportionately affect marginalised populations. We work with at-risk communities, ensuring the most effective interventions and treatments reach those who need them the most.



ABOVE: Kirby Institute researchers in our high containment laboratories

2021 by the numbers

The Kirby Institute received:
\$53,653,173 from new and continuing external grants in 2021
\$1,859,550 in philanthropic funding in 2021



3

NHMRC Program Grants



4

NHMRC Centre for Research Excellence Grants



291

staff members



81

postgraduate students



8

NHMRC Project Grants



1

ARC Research Grant



13

PhD completions



39

international postgraduate students from 24 countries



8

NHMRC Partnership Grants



15

National Institutes of Health (USA) Grants



3

academic promotions



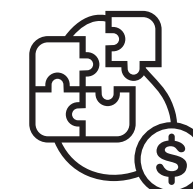
965

collaborations in 55 countries on 6 continents



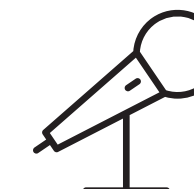
22

NHMRC Fellowships and Investigator Grants



8

Medical Research Future Fund Grants



42

Kirby Institute Seminar Series talks held



716

peer reviewed publications

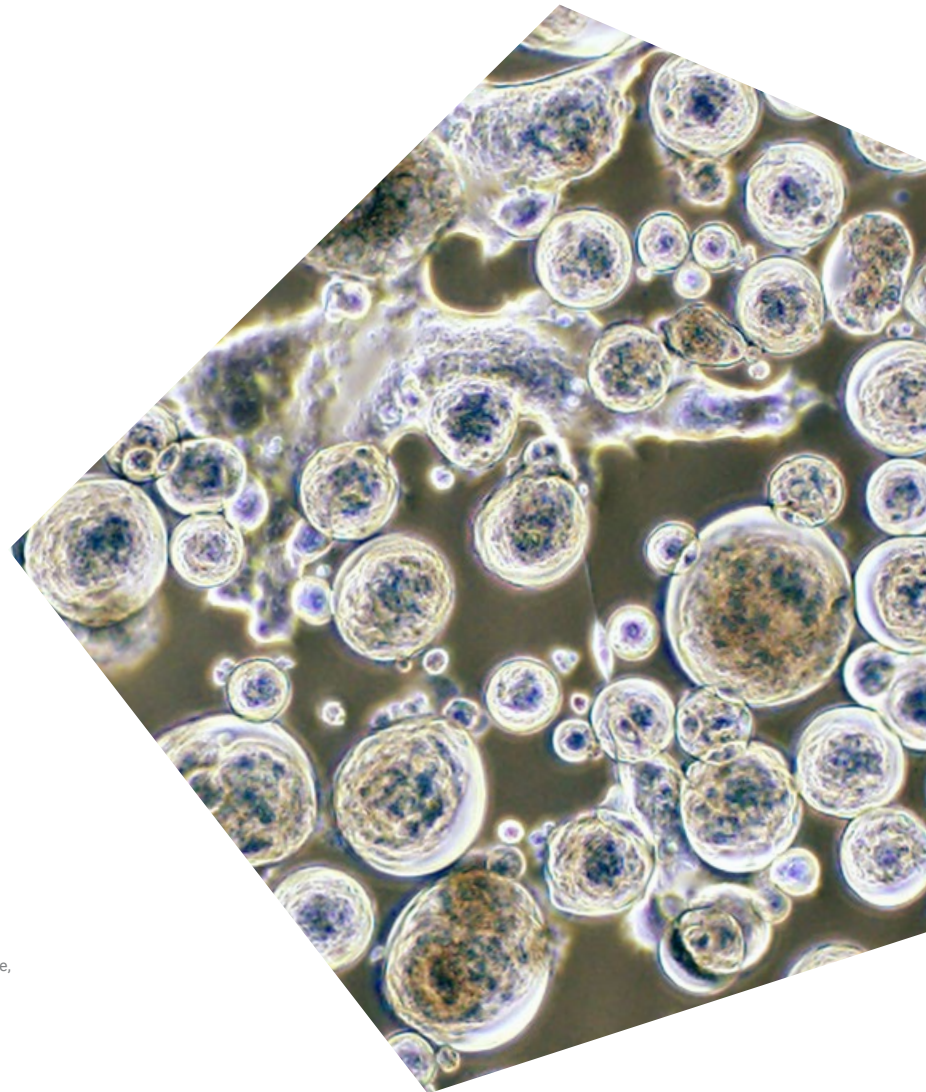
Our research

At its core, our mission is very simple: to ensure no infectious disease is left unchallenged. Focused in Australia and the Asia-Pacific region – but with global impact – our work improves human health and wellbeing.



COVID-19 and emerging infections

In 2021, we worked with collaborators to apply our expertise to the COVID-19 pandemic. We provided impactful research solutions that have influenced public health policy and saved lives.



PAGE 8: The SARS-CoV-2 B.1.351/Beta lineage, entering cells, 2-3 days post culture, 20x microscope objective
CREDIT: Stuart Turville

PAGE 9: Chansavath Phetsouphanh in the Kirby Institute's PC3 laboratory



Revealing the mystery of long COVID

One of the biggest challenges since the start of the global COVID-19 pandemic has been a post-infection syndrome referred to as 'long COVID.' While yet to be fully defined, it refers to a grouping of symptoms (including fatigue, shortness of breath, tightness in the chest, racing heart, difficulty concentrating and brain fog) that continue to impact the patient for months after the initial acute infection.

Because understanding the medium- to long-term impact of COVID-19 infection is critically important to post-COVID-19 clinical care and future health service requirements, revealing the mystery of long COVID is the central focus of the ongoing ADAPT study, conducted by Kirby Institute researchers in collaboration with St Vincent's Hospital, Sydney since Australia's first pandemic wave.

The ADAPT study follows unvaccinated patients diagnosed with SARS-CoV-2 infection at regular intervals extended out to two years post diagnosis. It collects details on their symptoms, including their respiratory and neurocognitive function, and mental health and wellbeing, with the hope that studying the immunological response will provide important information on the role of the immune system in recovery and treatment.

In 2021, new analysis of the ADAPT study, led by Dr Chansavath Phetsouphanh from the Kirby Institute, uncovered an immune profile for long COVID, potentially paving the way for tailored treatment for people with ongoing symptoms.

While evidence on long COVID has been accumulating through several clinical studies based on patient reporting, this is the first study to describe the impact of long COVID on the immune system through analysis in a laboratory setting. The findings were accepted for publication in *Nature Immunology* in late 2021.

"Our findings may validate some of the symptoms that people with long COVID experience," says Dr Phetsouphanh. "We found that there is a significant and sustained inflammation that indicates prolonged activation of the immune response, detectable for at least eight months following initial infection."

The researchers say that understanding the immune profile of long COVID will help the development of treatment and management of long COVID and that this study provides the strongest evidence to date for a clear biological basis for the clinically apparent syndrome.

Predicting COVID-19 vaccine efficacy

In early 2021, researchers from the Kirby Institute collaborated with the Doherty Institute and the University of Sydney to identify the immune response associated with protection from COVID-19.

Later in the year, they used the same analysis to predict how well vaccines will work against new strains.

The world-first discoveries have informed COVID-19 public health policy through providing a clearer picture to policymakers about how levels of protection against symptomatic disease, severe disease and death are likely to change based on different vaccines, emerging variants and over time.

"Neutralising antibodies are produced in response to infection or vaccination. Our work is the strongest evidence to date that shows that specific antibody levels translate to high levels of protection," says Dr David Khoury from the Kirby Institute's Infection Analytics Program.

"By measuring antibody levels across the range of new vaccine candidates during early phases of clinical trials, we can better determine whether a vaccine can prevent COVID-19," he continues.

The team of mathematicians, clinicians and scientists applied the analysis to variants including Delta and Omicron to understand how existing vaccines and boosters could help prevent transmission and severe disease.

"We found that in order to maintain immune protection across a population, booster shots were required," says Dr Deborah Cromer, who led this research.

"Without boosters, protection from symptomatic COVID may drop below 50 per cent after six months, which means more people will become infected. Reassuringly though, protection against severe disease and death will likely remain high over the first year."

These analyses will be crucial as the pandemic progresses and new vaccines and variants emerge.

"We've successfully applied the model against real world scenarios and found it to be highly robust. This is a huge win for the battle against COVID-19, as it will shorten our response times for vaccine and booster development," says Dr Cromer.

This research was published in *Nature Medicine* and *Lancet Microbe* during 2021.



Global clinical trials to find a COVID-19 treatment

In 2020, the United States National Institute of Allergy and Infectious Diseases (NIAID) - one of the National Institutes of Health - requested research to understand the natural history of COVID-19, identify risk factors for disease progression and determine the safety and efficacy of novel therapeutics.

In response, the International Network for Strategic Initiatives in Global HIV Trials (INSIGHT) jumped into gear, calling on its International Coordinating Centres (ICCs) to use their existing infrastructure to either initiate or assist with multiple COVID-19 studies.

The Kirby Institute coordinates the Sydney ICC (which includes Argentina, Australia, Chile, China, India, Israel, Japan, Malaysia, Mexico, New Zealand, Nigeria, Singapore, South Africa, Thailand and Uruguay), and throughout 2021, played a crucial role coordinating several treatment studies, predominantly in hospitalised COVID-19 patients, and one observational study across these countries.

Coordinating international studies is usually challenging, but in the midst of a global pandemic, it's been a monumental effort, explains Cate Carey from the Therapeutic and Vaccine Research Program (TVRP) at the Kirby Institute.

"Usually, we would sit face-to-face with study teams and walk through the study protocol piece by piece. But in a pandemic, it's all had to be managed online. It's been intensive at each stage and an enormous amount of work has gone into it."

Finding effective treatment options in hospitalised patients has been particularly challenging; and although many of the studies have demonstrated little treatment benefit, these findings add significantly to the COVID-19 knowledge base. Professor Gail Matthews, head of TVRP, is confident that their work will continue to inform the development of treatments.

"Our aim is to conduct these studies to the highest standard, generating the knowledge which will inform the best treatment options for patients across a wide range of settings globally. Hopefully we get closer to finding some of the answers for the sickest and most difficult to treat patients, informing management not only in this pandemic, but future pandemics to come."

PAGE 10: David Khoury in the foreground with members from the the Kirby Institute's Infection Analytics Program. The program applies a mathematical lens to biological challenges, gaining a better understanding of infectious diseases.

PAGE 11: Gail Matthews, head of the Therapeutic Vaccine and Research Program

Informing global policy and influencing research

The Kirby Institute's COVID-19 immune correlate research has been widely cited by other academics and referenced in policy documents prepared by the World Health Organization (WHO), the US Centers for Disease Control (CDC) and the Australian Technical Advisory Group on Immunisation (ATAGI).

"Research informing policy is the most effective way to ensure that advances in science translate to better health and wellbeing for populations impacted by disease," says Professor Miles Davenport, head of the Infection Analytics Program.

Findings that were published in *Nature Medicine* were accessed over 600,000 times, making it the most widely accessed article for UNSW Sydney in 2021, and most accessed article in *Nature Medicine* in 2021.



Finalist in the 2021 Eureka Prize

In September 2021, a cross-faculty team at UNSW, led by the Kirby Institute's Professor Raina MacIntyre, was named a finalist in the Australian Museum's *Eureka Prize for Excellence in Interdisciplinary Scientific Research*.

Their collaboration, called U-BREATHE, comprised leading experts across UNSW Medicine and Health and UNSW Engineering, who developed state-of-the-art technology to measure and visualise aerosol particles from human emissions like sneezes and coughs.

"U-BREATHE investigated the evidence supporting the physical distance guideline of one metre for healthcare workers to protect them from COVID-19 respiratory droplet transmission, as well as the effectiveness of face masks in preventing transmission," explains Prof MacIntyre.

"Our work showed that the initial advice of one metre physical distancing was inadequate and that respiratory droplets could in fact travel several metres. This highlights the importance of adequate personal protective equipment, and much greater physical distance."

'Supercharged' cells to help analyse SARS-CoV-2 variants faster

In 2021, our researchers developed cells that allowed them to test the effect and characteristics of SARS-CoV-2 faster than anywhere else in the world.

The team, led by Associate Professor Stuart Turville, use these genetically 'supercharged' cells to quickly understand the dynamics of different variants of the virus, to test their ability to evade vaccines, and to inform the public health response in real time.

"In these genetically developed cells, the virus replicates four times faster than through any other techniques currently published," A/Prof Turville says. "This means we can quickly understand the potential of the virus to transmit, how the virus reacts to treatments and whether the virus is changing."

The Kirby Institute's Director, Professor Anthony Kelleher, says this work is an incredible asset to Australia's response to COVID-19. "We've reduced the timeline to characterise a viral variant from one month to one week. It's an exceptional innovation."

Harnessing artificial intelligence to prevent the next pandemic

The Kirby Institute's Professor Raina MacIntyre and UNSW colleagues were awarded a Medical Research Future Fund (MRFF) Frontiers Stage 1 grant for an artificial intelligence (AI) epidemic early warning system which has the potential to change the way we manage health security.

Early detection of new viruses can prevent global pandemics. Currently, public health systems rely on doctors or laboratories to report epidemics. But researchers at the Kirby Institute plan to develop a system that will use a vast array of uncurated, open-source data. Through examining social media and news reports, the researchers will capture the concerns and discussions of the community, and analyse these huge datasets to predict future pandemics.

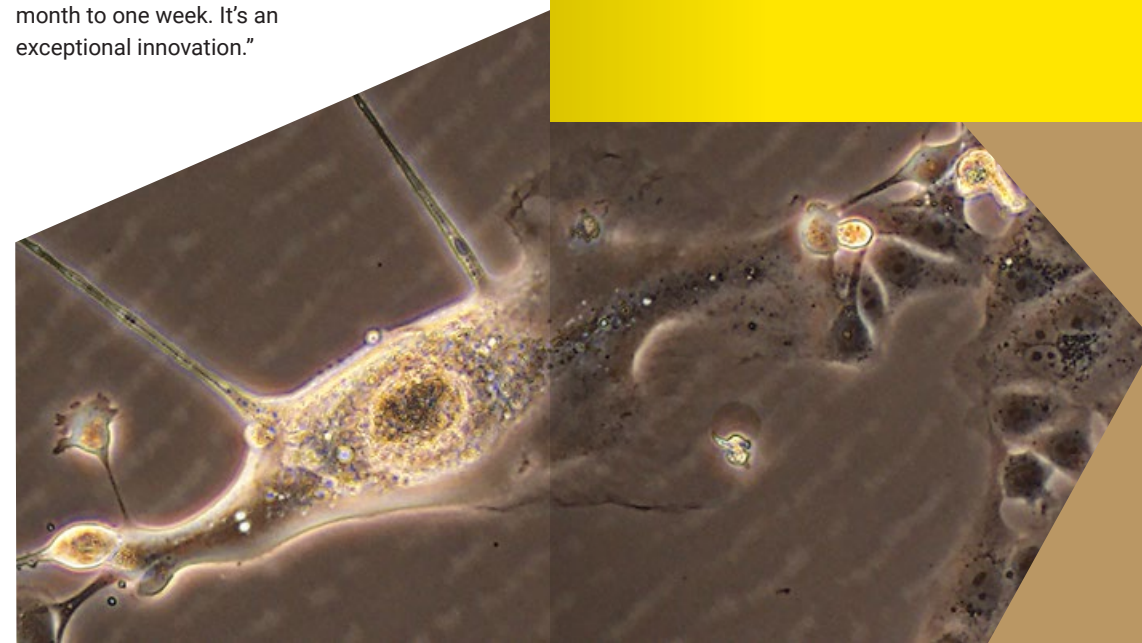
The automated, intelligent system for rapid epidemic detection using open-source data developed by Prof MacIntyre and her team is called EPIWATCH. "There is an enormous untapped resource of information published online day-to-day, which can give us immediate insights into what people are experiencing in their lives," says Prof MacIntyre. "This information could raise the red flag much earlier and help us identify and prevent a potential pandemic, which as we have seen has devastating health and economic consequences."



Spotlight on a researcher:

Rowena Bull

Associate Professor Rowena Bull is an immunovirologist who has been working with colleagues at the Kirby and Garvan Institutes on cutting-edge rapid genomic sequencing technology to help determine the source of hard-to-trace coronavirus cases. This 'Nanopore' technology enables scientists to identify the genetic variation that occurs when SARS-CoV-2 passes from person to person and establish how different cases of coronavirus are linked, to know where a case was potentially picked up from and who they may have given it to.



PAGE 12, TOP: Raina MacIntyre, head of the Biosecurity Program

PAGE 12, BOTTOM: SARS CoV-1 Omicron BA.1 2-3 days post infection
CREDIT: Stuart Turville

Aboriginal and Torres Strait Islander health

Some of our most important work starts at home. We work in close collaboration with Aboriginal and Torres Strait Islander health services on solutions for key health issues.



PAGE 14: Detail of an artwork by Jasmine Sarin, a proud Kamilaroi and Jerrinja woman

PAGE 15: A community in Central Australia where Kirby Institute researchers work to understand how to increase access to STI testing among young Aboriginal people
CREDIT: Stephen Bell

Huge investment boosts testing in regional and remote Aboriginal communities

In November 2021, a consortium co-led by the Kirby Institute and the National Aboriginal Community Controlled Health Organisation (NACCHO) received almost \$10 million to scale up infectious disease testing in Aboriginal and Torres Strait Islander communities. The grant will be used to develop a national framework for point-of-care testing, and follows extensive work by researchers, clinicians and Aboriginal and Torres Strait Islander communities, both prior to and during the pandemic.

Led by the Kirby Institute's Professor Rebecca Guy and NACCHO's Dr Dawn Casey, the grant represents a paradigm shift for managing infectious diseases by bringing diagnostic laboratory technology into a local community setting.

"Infectious disease rates are unacceptably high for many Aboriginal and Torres Strait Islander communities, and for many people the nearest laboratory is hundreds, or even thousands of kilometres away," says Prof Guy.

According to Robert Monaghan, National Community Engagement Lead on the project and Manager of Aboriginal and Torres Strait Islander Health Research at the Kirby Institute, the program will utilise point-of-care technology which allows a health worker, nurse or doctor to collect a sample from a patient and analyse it on site, with results available within one hour.



"If the result is positive, a patient can begin treatment immediately. If negative they can avoid unnecessary treatments that have been offered 'just in case' while waiting for results," he says.

The project will build on a decade of successful partnerships between the Kirby Institute and Aboriginal communities by enabling testing facilities in more communities for a wider range of infectious diseases. The International Centre for Point-of-Care Testing at Flinders University is also a key partner.

"It will be great to expand on our nearly 100 point-of-care testing machines, which were initially testing for sexually transmissible infections as part of the TTANGO and TTANGO2 studies; then, most recently, utilised as part of an emergency COVID-19 response. Because of our existing partnerships and infrastructure, we were able to help mobilise COVID-19 testing and outreach services in a matter of hours," says Prof Guy.

This will be the first program internationally to take a fully integrated, multi-disease health systems approach to decentralised infectious disease point-of-care testing and Prof Guy says she is looking forward to continuing to work in partnership to achieve better health for Aboriginal communities.



Responding to the infectious syphilis outbreak in Queensland

As part of an ongoing project to model a syphilis outbreak among Aboriginal and Torres Strait Islander people in regional and remote areas of Australia, Kirby Institute researchers undertook an analysis for the Multi-jurisdictional Syphilis Outbreak Working Group (MJSO) to evaluate the response to the outbreak and provide guidance on control and prevention strategies.

The outbreak was identified in 2011 in Far North Queensland, and has since spread to most other jurisdictions. Syphilis can cause serious health problems and can lead to infant mortality if left untreated, but it is easy to test for and cure if picked up early.

The new analysis and report have now shown that the outbreak response is having some success. It has contributed to a likely stabilisation of the outbreak and averted a substantially worse epidemic.

The MJSO testing coverage data suggests that the percentage of people tested annually has almost doubled since 2013, but continued efforts are needed. To reduce the outbreak, testing must ideally cover 60 per cent of the population annually.

Modelling testing and response strategies for COVID-19 outbreaks

Remote Aboriginal and Torres Strait Islander communities have the potential to be severely impacted by COVID-19, with multiple factors predisposing them to increased transmission and disease severity. As a result, Kirby Institute researchers undertook modelling that aimed to inform an optimal public health response.

Researchers examined a range of strategies for case finding, quarantining of contacts, testing and lockdown, to be implemented following the detection of a case.

Their research, published in September 2021 in *BMC Infectious Diseases*, concluded that a SARS-CoV-2 outbreak would spread rapidly in remote communities. As a result, prompt case detection with quarantining of extended household contacts, plus a 14-day lockdown for all other residents, plus exit testing for all, is the most effective strategy for rapid containment.

Because a compliance rate of upwards of 90 per cent is crucial, the researchers also underscored the importance of community-supported, culturally-sensitive responses undertaken in partnership with communities.

Strong partnerships, improved health outcomes

The Aboriginal and Torres Strait Islander Reference Group was convened in 2019 to inform a project on gonorrhoea control and to provide advice on the Kirby Institute's *Annual Surveillance Report on blood-borne viruses and sexually transmissible infections in Aboriginal and Torres Strait Islander Australians*, a large, ongoing project funded by the Australian Government.

Chaired by Robert Monaghan, Manager of Aboriginal and Torres Strait Islander Health Research at the Kirby Institute, reference group membership include Kirby Institute researchers working in Aboriginal health, and Aboriginal and Torres Strait Islander people from each state and territory, who provide advice and input into the development, implementation and interpretation of the research.

The reference group enables Aboriginal and Torres Strait Islander representatives to have direct input into these important projects. It also provides a vital conduit to communicate the research findings to communities and stakeholders in an effective and culturally-appropriate manner.

Most recently, the reference group provided valuable input into a hepatitis C elimination report, which was published at the end of 2021.

Spotlight on a researcher:

Jackie Thomas

Research Officer

Jackie is a proud Kamilaroi woman and mother.

For over a decade, she has worked alongside and with Aboriginal communities and is currently a Research Officer at the Kirby Institute. She is passionate about Aboriginal sexual health and wellbeing, especially sexual health and immunisation for all ages.

Jackie is involved in a number of projects at the Kirby Institute, including an innovative project engaging Aboriginal and Torres Strait Islander youth in matters surrounding sexual health and wellbeing, as well as projects focused on human papillomavirus (HPV) immunisation, and point-of-care testing for STIs among Aboriginal people.

She is also a Committee Member of the RAPID Diagnostic Centre's Early- and Mid-Career Researcher Committee (NHMRC Centre for Research Excellence).

In 2021, she commenced a Master of Public Health at the UNSW School of Population Health under the School's Indigenous Entry Scheme.

TOP: The Aboriginal and Torres Strait Islander reference group includes members representing each Australian jurisdiction. Pictured here is: [back row] Tania Passi, Queensland Health (centre); Peter Waples-Crowe, Thorne Harbour Health, Victoria (2nd from right); [front row, left to right] Sarah Betts, Aboriginal Health Council of South Australia (2nd from left); Annette Slater, Hunter New England Local Health District, NSW; Kim Hawke, Aboriginal Health Council of Western Australia; Michelle Cutmore, Hunter New England Local Health District, NSW. They are joined by Kirby Institute colleagues.

Our health solutions target global problems and have global impact. We work in partnerships across a wide range of countries to meet priority health needs in our region and beyond.



Building capacity for infectious disease management in the Indo-Pacific

In 2021, the Kirby Institute was awarded two grants totalling almost AU\$9 million to enhance capacity for infectious disease management in the Indo-Pacific region. These grants are part of an expanding program of global health research at the Kirby Institute.

The first was awarded to a consortium of Australia's leading infectious disease research centres – the Kirby, Doherty and Burnet Institutes – together with international collaborators, the Clinton Health Access Initiative (CHAI) and FIND, the global alliance for diagnostics. With over \$5 million in funding this project will strengthen diagnostic testing for COVID-19, HIV, malaria and tuberculosis in selected countries of the Indo-Pacific region.

“We will work with our partners in Papua New Guinea, Cambodia and Lao PDR to enhance local laboratory capacity which is essential for the accurate diagnosis and management of these infectious diseases,” says Professor John Kaldor, Head of the Global Health Program at the Kirby Institute.

Professor William Pomat, Director of the Papua New Guinea (PNG) Institute of Medical Research, and an Honorary Professor at the Kirby Institute, welcomed the announcement.

“We have a longstanding partnership with the Kirby Institute and have achieved important health outcomes through our collaborative efforts. This new collaboration will help set PNG on the best possible path to improve the detection of HIV, tuberculosis and malaria, as well as improve our capability to do COVID-19 testing.”

The second grant, worth almost \$4 million, was awarded to a Kirby Institute-led consortium by FIND (Foundation for Innovative New Diagnostics). This consortium also includes the Kirby, Doherty and Burnet Institutes, and CHAI, and will enhance the use of COVID-19 diagnostics in Cambodia, Papua New Guinea, Lao PDR and Indonesia.

“Our expertise has greatest impact when it is translated on the ground to strengthen disease detection and improve health outcomes,” says the Kirby Institute’s International Development Manager, Liza Doyle, who led the teams who were successful in these two awards.

PAGE 18: From left to right - John Kaldor, Angela Kelly-Hanku, William Pomat and Andrew Vallely

PAGE 19: Community health volunteers, Papua New Guinea



Controlling neglected tropical diseases

The Kirby Institute continues to expand its research programs in neglected tropical diseases (NTDs). NTDs impact more than one billion people worldwide, mainly in low-income countries, and our research focuses particularly on intestinal parasites, trachoma, scabies, yaws and schistosomiasis.

In 2021, Kirby Institute research in Fiji, Nauru, Timor-Leste and Vietnam continued, with new projects embarked on in Solomon Islands, Angola and Vanuatu.

A highlight for 2021 was the award of a \$1.5 million NHMRC Partnership Project to a consortium of investigators led by the Kirby Institute, bringing together Australian-based and international researchers, non-governmental organisations and national ministries of health in a multidisciplinary effort to improve the control of key NTDs in the region.

“This funding will provide a welcome boost to our research capacity as we work alongside government agencies and non-government partners which are delivering control programs in these countries. By taking a multi-disciplinary approach, we will provide new knowledge about how best to implement and evaluate integrated control for multiple NTDs, to enhance impact and ensure sustainability of these programs,” says Associate Professor Susana Vaz Nery, lead of the NTD Research Group.

PAGE 20, TOP: Community liaison officers planning outreach activities in Madang, Papua New Guinea

PAGE 20, BOTTOM: A member of the research team for a community-wide soil-transmitted helminth elimination project in Vietnam explains deworming to a classroom of children at one of the study schools

PAGE 21, TOP: A pharmacy in Tabalong, Indonesia

Kirby Institute partners on WHO report for HTLV-1

The Kirby Institute was commissioned by the World Health Organization (WHO) to prepare a series of comprehensive reviews on the occurrence, diagnosis, prevention and treatment of the Human T-lymphotropic virus type 1 (HTLV-1), the first human retrovirus to be discovered over 40 years ago.

These reviews provided the primary technical resource for the first ever global consultation on HTLV-1, which took place in Tokyo in November 2019, and led to a comprehensive report being published by WHO, drawing heavily on the reviews, in March 2021. HTLV-1 causes a serious life-long infection in humans. Like HIV, it is transmitted through breast feeding, sexual intercourse and blood contact, but it differs substantially in regard to its disease profile.

Important recommendations from the consultation and report include the need for comprehensive integration of HTLV-1 testing and prevention into existing strategies for the control of blood-borne viral and sexually transmissible infections, and the development of treatment guidelines.



Combating antimicrobial resistance in Indonesia

The problem of antimicrobial resistance – or AMR – is amplified by inappropriate prescribing of antibiotics. It is a major public health concern as it drives the micro-organisms that cause disease to become resistant to the antibiotics used to treat them.

To help combat AMR in Indonesia, researchers at the Kirby Institute, in collaboration with the Universitas Gadjah Mada, Universitas Sebelas Maret, the Indonesian Ministry of Health, London School of Hygiene & Tropical Medicine, University College London, and The George Institute for Global Health undertook a study to investigate antibiotic dispensing by private drug sellers.

Their research, published in *BMJ Global Health* in August 2021, showed that two-thirds of visits to private drug retail outlets by people stating that they had a particular medical problem resulted in the dispensing of antibiotics without a prescription, which is contrary to guidelines.

The study highlighted the need for a multi-faceted approach to the problem of inappropriate prescribing, and contributed to the Indonesian Ministry of Health prioritising AMR control and committing resources to finding solutions.

In partnership with Professor Tri Wibawa from the University of Gadjah Mada, the team published further findings in *Lancet Regional Health* demonstrating the critical role played by pharmacies during the COVID-19 pandemic, but also highlighting challenges such as the inappropriate dispensing of antibiotics to clients suspected of having COVID-19.

“We are working with stakeholders to better integrate private providers like community pharmacies into national pandemic response efforts,” says Professor Virginia Wiseman from the Kirby Institute.

Spotlight on a researcher:

Rabiah Al Adawiyah

“Working at a world-leading research institute in infectious disease like the Kirby Institute has enabled me to connect with many renowned experts in my field.”

Dr Rabiah Al Adawiyah is a Scientia PhD Student with the Kirby Institute’s Surveillance and Evaluation Research Program. She is a medical doctor and also holds a Master of Medical Science in Health Economics, Policy and Management. Her PhD pioneers the investigation of the critical issue of mother-to-child transmission of HIV and syphilis in Indonesia where she is analysing health system barriers and facilitators to integrate and scale-up antenatal testing and treatment programs into the maternal healthcare system.





PAGE 22, TOP: 2021 Brett Tindall Memorial Lecture with keynote speaker The Honourable Jillian Skinner (top left)

PAGE 22, BOTTOM: 2019 International Women's Day event, "Promoting gender equity in health" (prior to the COVID-19 pandemic restrictions)

Kirby's 2021 Seminar Series shares research with wide audiences

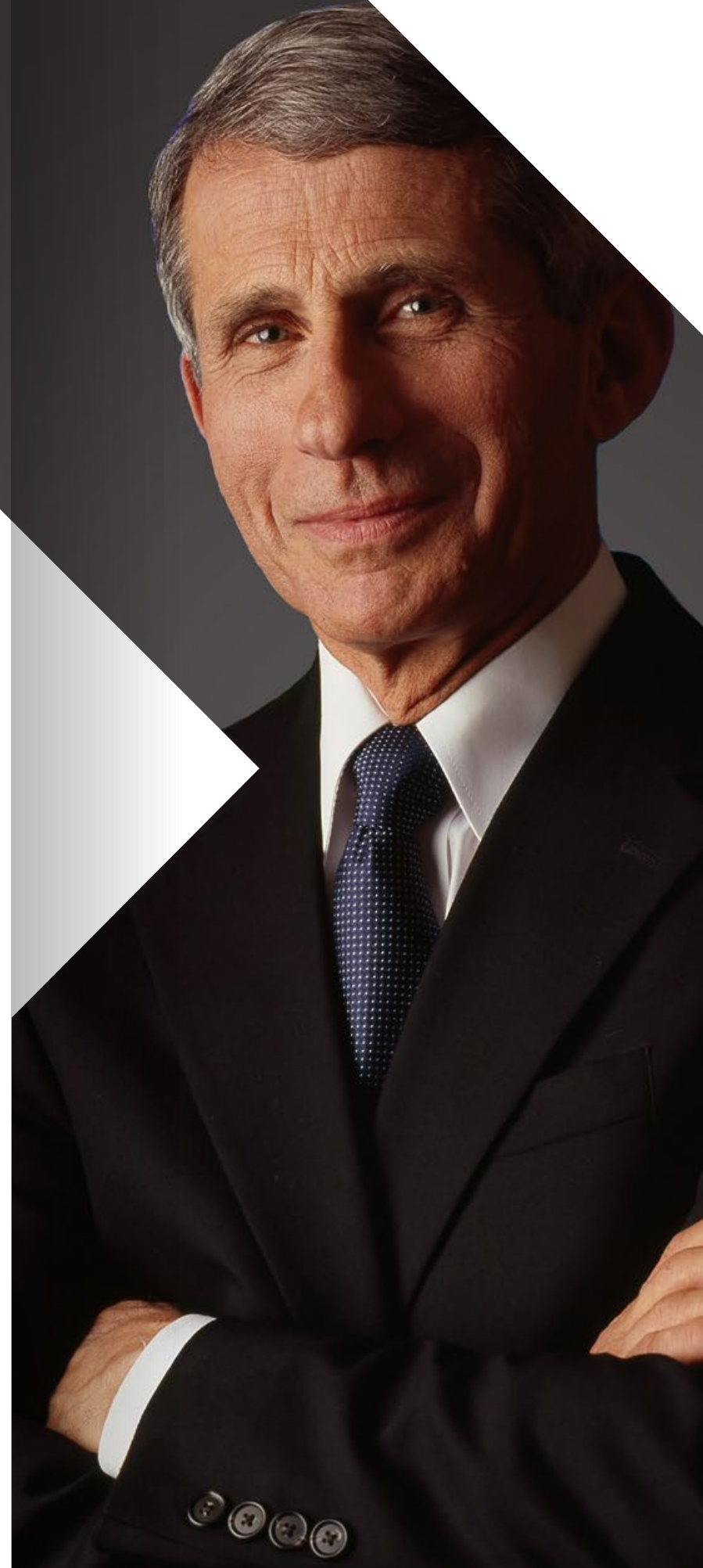
The Kirby Institute's weekly Seminar Series offers a platform for Kirby Institute researchers and collaborators, as well as high profile Australian and international researchers to share their insights into infectious diseases. Although we were unable to hold in-person events in 2021, moving the Seminar Series online enabled us to reach more people and attract global speakers.

Throughout 2021, the Kirby Institute hosted 42 seminars. This included the Brett Tindall Memorial Lecture, which has been held each year since 2012 in honour of one of the institute's early researchers and a great friend, Dr Brett Tindall. In 2021 it was awarded to The Honourable Jillian Skinner, former NSW Minister for Health and a champion for collaborative, community-driven research and health implementation. Mrs Skinner shared her reflections on that time, and her passion working with colleagues and community members across many sectors to improve health.

We were also thrilled to host Dr Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases and Chief Medical Advisor to the President of the United States, who gave the inaugural David Cooper Lecture, sharing his extensive insights and paying special tribute to his colleague, our founding Director, the late Professor David Cooper AC.

The 2021 Seminar Series featured presentations from 45 Kirby Institute speakers about their research, played host to six international speakers and also featured seminars in acknowledgement of important awareness days including International Women's Day, NAIDOC Week and World Hepatitis Day.

Dr Benjamin Bavinton, Chair of the Seminar Series Committee, says the weekly talks provide a platform for our researchers to share their work with the community. "Infectious disease research is increasingly sought out and valued by other academics and the broader public. These seminars facilitate discussion, knowledge sharing and promotion of important research topics," he said.



Dr Anthony Fauci shares insights on the science and politics of pandemics

In April 2021, Dr Anthony Fauci shared his fascinating insights into the global response to COVID-19 and his work on the HIV/AIDS epidemic in the 1980s.

Thousands tuned in to hear Dr Fauci in conversation with ABC's *Coronacast* co-host Tegan Taylor, in what was UNSW Sydney's highest attended online event ever held.

Fauci commended Australia's immediate country-wide lockdown response to the pandemic and explained why it was a trickier task in the United States saying, "It's a complicated situation. Australia, I believe, is one of the better countries in the entire world with how you responded."

The topic of President Trump and the challenges Dr Fauci faced during Trump's presidency in terms of the COVID-19 public health messaging was also raised during the lecture, as were his thoughts on individuals refusing to accept the vaccination and the reasons, including the proliferation of 'fake news', behind this mentality.

Dr Fauci, who is a key architect of the HIV/AIDS program PEPFAR, an initiative that has saved over 18 million lives globally, also spoke of the US response to HIV/AIDS in the 1980s and his early work with the Kirby Institute and Professor David Cooper AC, the inaugural Director.

The David Cooper Lecture honours the legacy of the Kirby Institute's founding Director Professor David Cooper AC, who passed away in 2018. He was an internationally renowned scientist and HIV clinician.

HPV

Human papillomavirus, or HPV, is an infection that can lead to cervical, anal and oral cancers. We work to evaluate and improve vaccination and screening programs designed to prevent HPV infection or eliminate HPV-related lesions before they can progress to cancer.



Eliminating cervical cancer in the Western Pacific

This year the Kirby Institute welcomed the announcement of an AU\$8.1 million grant from the Minderoo Foundation to establish a landmark cervical cancer elimination program in the Western Pacific.

The initiative is co-led by Cancer Council NSW, the Kirby Institute, Australian Centre for the Prevention of Cervical Cancer, and Family Planning NSW in close collaboration with in-country partners and stakeholders. It is part of a growing global health research program at the Kirby Institute.

The Western Pacific has among the highest rates of cervical cancer in the world. There are an estimated 1,200 deaths in Papua New Guinea (PNG) alone every year. HPV causes almost all cervical cancers worldwide and can be prevented by childhood vaccination, whilst screening women is highly effective in detecting early HPV-related disease and preventing cervical cancer.

Professor Andrew Vallely is leading the Kirby Institute's engagement in this initiative. "Our role is to continue working closely with our in-country partners to ensure their incredible dedication, enthusiasm and commitment to cervical cancer prevention over many years is translated into lives saved," he says.

The good news continued in June 2021, when the Australian Federal Government awarded the Kirby Institute a further \$1.59 million to undertake additional cervical cancer screening research, specifically in rural PNG. Prof Vallely will lead this project too.

"In our earlier field trials in PNG, we developed a new 'test and treat' HPV screening model which proved highly effective, acceptable and cost-effective," he says.

"Building on these findings we will establish how best to reach women in rural and remote communities, where cervical pre-cancer and cancer rates are highest, and access to health services most constrained."

Professor William Pomat is Director of the PNG Institute of Medical Research and a lead investigator on the grant. "This award builds on more than a decade of collaborative research on cervical screening and cancer prevention led by the PNG Institute of Medical Research and the Kirby Institute," he says.

"I am delighted we now have an opportunity to continue to drive the elimination agenda forward, together with partners in PNG and Australia, and obtain the critical evidence required to ensure no woman in PNG is left behind."

Informing treatments to prevent anal cancer

In August 2021, the National Institutes of Health awarded almost AU\$400,000 to a Kirby Institute-led study that will inform the development of treatments for pre-cancerous anal lesions.

Anal cancer is a rare but aggressive form of cancer caused by high-risk strains of HPV, and HIV-positive gay and bisexual men are at particular risk. The pre-cancerous lesions can be detected early, but this requires well-resourced and targeted testing.

"This study will determine the body's immune response at the site of the infected tissue, particularly the memory T cells located in the tissue, which are known to play a role in anti-tumour immunity," says Kirby Institute Director Professor Anthony Kelleher, Principal Investigator on the study.

"Importantly, this work also has the potential to inform preventative treatment for other HPV-associated malignancies of the cervix, genitals, head and neck, which would be a huge, lifesaving innovation."

Spotlight on a researcher: Andrew Vallely

"We are working closely with our in-country partners to ensure their incredible dedication, enthusiasm and commitment to cervical cancer prevention over many years is translated into lives saved now and in the future."

Professor Andrew Vallely has lived and worked in high-burden, low-resource settings for more than 25 years and currently leads the Kirby Institute's engagement in a world-first proof-of-concept cervical cancer elimination program in the Western Pacific.



HPV vaccination program success in Australia

For over a decade, Kirby Institute researchers have been monitoring and evaluating the impact of the Australian Government-funded HPV vaccination program on rates of genital warts in Australian-born female and heterosexual male individuals. The vaccination program was introduced in April 2007 for girls and young women, and in February 2013 for boys.

Australia is considered a world leader in HPV vaccination, and two Kirby Institute studies published in 2021 have reinforced and demonstrated the effectiveness of the program in reducing rates of HPV, which can also develop into cancer if left undetected.

Published in *The Lancet Infectious Diseases* in July 2021, research led by Professor Basil Donovan examined the trends in genital warts among individuals who attended sexual health clinics throughout Australia before and after the introduction of the vaccination program. Genital warts are measured as an indicator for HPV prevalence, as genital warts are caused by HPV viruses targeted by the vaccine.

The results of the study, which was funded by Seqirus Australia and the Australian Government Department of Health, showed that the gender-neutral HPV vaccination program has led to a substantial and ongoing reduction in genital warts among Australian female and heterosexual male individuals, with the most marked reduction in young people who received the vaccine at school.

In a related study, published in August 2021 in *ScienceDirect*, Kirby Institute researchers led by Dr Dorothy Machalek investigated HPV prevalence and risk factors among Australian women, nine to 12 years after the vaccine program was introduced.

This study showed that a wide range of HPV types were commonly detected among women aged 18-35, but the high and widespread uptake of the HPV vaccine has completely changed the epidemiology of HPV infection in Australian women. Vaccination has markedly reduced the prevalence of vaccine-targeted types, including amongst women with known risk factors for infection.

The findings of these studies reinforce the need to continue efforts to increase vaccine coverage and emphasise the importance of cervical cancer screening among unvaccinated populations.

HIV

We work to prevent HIV transmission and to improve health outcomes for people living with HIV, in Australia and globally.



Declines in HIV diagnoses in NSW thanks to PrEP

Research from the Kirby Institute, published in *The Lancet HIV* in July 2021, shows that HIV transmissions are at historically low rates among almost 10,000 high-risk gay and bisexual men on pre-exposure prophylaxis (PrEP), the HIV prevention medication.

The study showed that low HIV rates persisted after PrEP moved from being available cost-free as part of a NSW clinical trial, to being available at a subsidised cost through the Australian Pharmaceutical Benefits Scheme in 2018.

The NSW Health-funded research is the culmination of a three-year study called EPIC-NSW, which is the first study globally to measure the impact of PrEP on reducing HIV in a large population.

“We are pleased that the modest cost of accessing PrEP had virtually no impact on HIV transmission among the study participants we followed for the first year of PBS-listed PrEP,” says the Kirby Institute’s Professor Andrew Grulich, who led the study.

“For the year following its listing on the PBS, we found PrEP use remained high among the study participants, and HIV rates remained very low, at about two in 1,000 participants per year.”

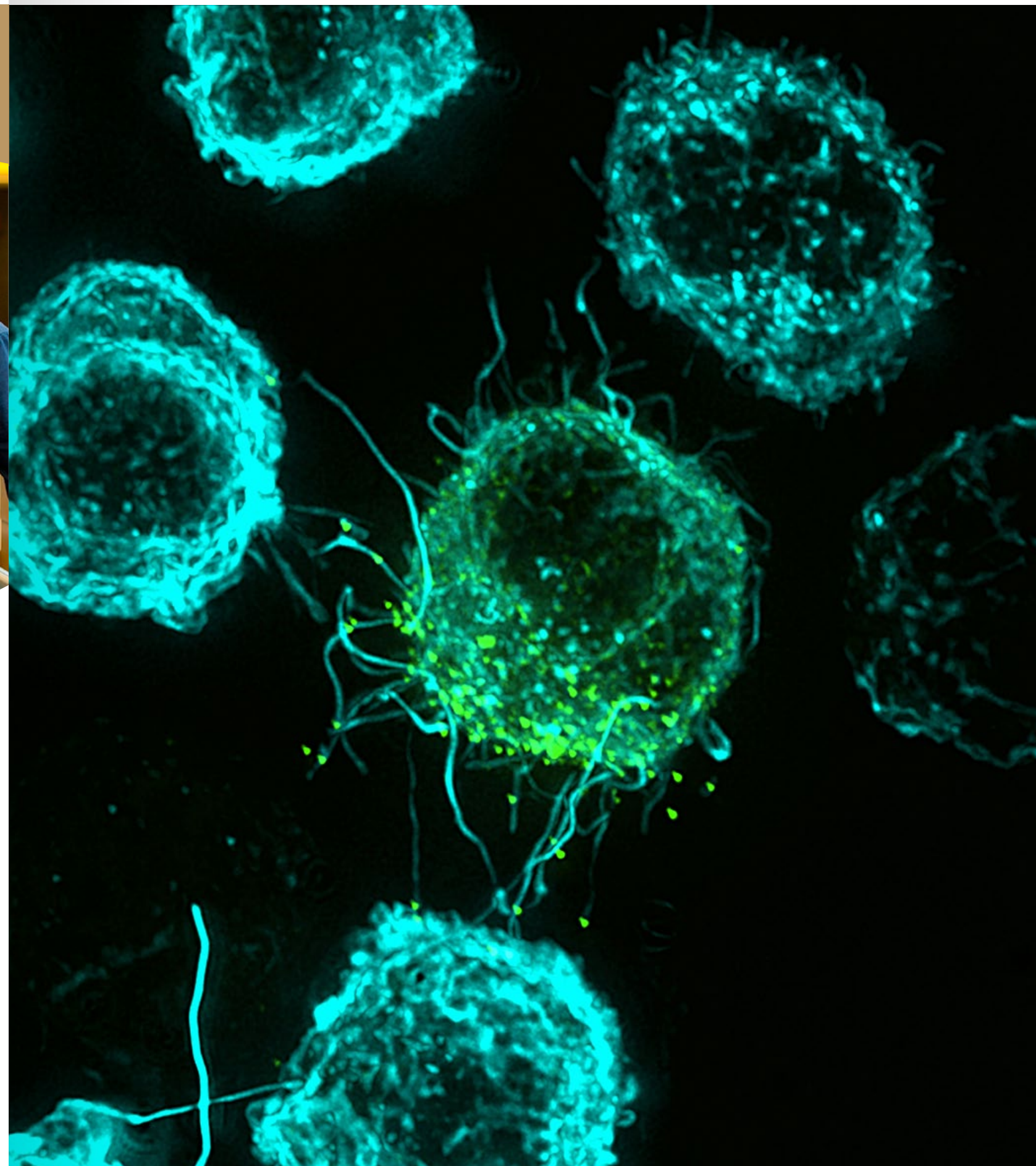
EPIC-NSW was originally designed to monitor the impact of PrEP on HIV rates among 3,700 HIV-negative people in NSW for one year but, due to demand, it was expanded to anyone in NSW who was eligible. This meant the study virtually tripled in size and duration.

Kirby Institute Director, Professor Anthony Kelleher, says the declining rates of HIV transmission not only in NSW, but Australia-wide, are the result of strong partnership and cross-sector collaboration.

“EPIC-NSW was a landmark trial that showed what can be achieved – with broad availability of this important HIV prevention tool – when government, researchers, clinicians and the community come together for a common cause,” he says.

PAGE 26: Andrew Grulich from the Kirby Institute and Karen Price from ACON

PAGE 27: Colourised microscopic image of HIV cells
CREDIT: Stuart Turville





The impact of COVID-19 on Australian gay and bisexual men

When the COVID-19 pandemic emerged in 2020, Kirby Institute researchers were concerned it might have an impact on HIV prevention. So, using the established infrastructure of the Flux Study, researchers asked hundreds of gay and bisexual men (GBM) in Australia to monitor how COVID-19 was affecting their lives.

With funding support from NSW Health, participants completed weekly surveys (referred to as 'weekly diary entries') to monitor near real-time changes in their PrEP use, sexual behaviours, and HIV & STI testing behaviours amid the pandemic.

In 2021, after running for a year, the study offered powerful insights into how Australian GBM responded to the pandemic. Following a substantial decline in PrEP use in 2020, prevalence of PrEP use has gradually been returning to pre-pandemic levels in 2021. Fluctuating trends in the prevalence of PrEP use, sexual behaviours, and HIV & STI testing correspond with trends in new COVID-19 cases and government-imposed restrictions. Data from the Flux Study are now being used to shape the way government and community organisations respond to health concerns among GBM.

Self-testing technology increases equitable access to HIV testing

Gay and bisexual men are at increased risk of HIV, and frequent testing is crucial to drive down infections among this group. Self-testing kits have been proven to be very effective based on short-term studies, but in 2021, Kirby Institute researchers were the first to measure their effectiveness over a long time period.

The world-first study, published in *The Lancet Regional Health - Western Pacific*, found that access to free HIV self-testing kits increased the frequency of HIV testing over a two-year period, when compared to men who only had access to facility-based testing.

In Australia, HIV self-testing kits are approved by the Therapeutic Goods Administration. However, they can only be purchased online or at specific locations like HIV community organisations and pharmacies. This study clearly demonstrates the need for HIV self-testing kits to be affordable, available and widely accessible in Australia.

Positively Women

In 2021, the Kirby Institute, in close partnership with Positive Life NSW and HIV community organisations across Australia, were thrilled to launch Positively Women, a community-based arts research project where the participants use the power of art to express what it means to be a woman living with HIV in Australia.

The project involved the development of a new method of arts-based research which included meditation and a variety of creative practices such as drawing, poetry and movement. The result is an online exhibition of artworks that highlight the strength and creativity of these women as well as the joys and struggles of their daily lives, including the stigma and discrimination they continue to face.

The research also involved inviting people to visit the site and participate in a short survey. The purpose was to understand if viewing women's images and stories change other people's understandings of and attitudes towards HIV.

PAGE 28-29, TOP: Detail of an artwork created by Kath Leane from the Positively Women project

HIV viral suppression rates too low among children and adolescents

In the lead up to World AIDS Day in 2021, an analysis by the Kirby Institute and the global IeDEA consortium revealed that HIV is 'virally suppressed' in only 59 per cent of children and adolescents at 3 years on treatment, after adjusting for missed tests, young people lost to follow-up and children transferred to other sites. Viral suppression means that treatments are working to protect health and prevent the transmission of HIV to others.

The research, published in *The Lancet HIV*, draws together HIV epidemiological data and expertise across seven global regions. While the study shows substantial progress in the global response to HIV, the needs of children and adolescents often fall behind those of adults.

With a UNAIDS target of 95 per cent viral suppression among all people living with HIV on treatment by 2030, the study demonstrates that more effort must be put into addressing the unique social and development challenges young people face in growing up with HIV.

Spotlight on a researcher:

Nila Dharan

Dr Nila Dharan is an infectious diseases physician and in 2021, she completed a PhD in the area of HIV comorbidities and ageing, aimed at understanding the spectrum of comorbidities among people living with HIV in Australia, and understanding ageing-related genetic changes in people with HIV.

"Thanks to lifesaving antiretroviral treatment development over the past 40 years, people with HIV are living longer lives. The question of how HIV affects the ageing process, and what we can do to maximise the health and quality of life of older adults with HIV, is becoming an increasingly important field of research."



Viral hepatitis

Hepatitis impacts some of the world's most vulnerable communities, but globally, life-saving prevention measures and treatments are not widely available. We work to ensure equitable access to hepatitis B and C prevention, treatment and care.

Access to testing and treatment in prisons crucial to hepatitis C elimination

In May 2021, a five-year, high-impact study by the Kirby Institute demonstrated that broad access to hepatitis C testing and treatment in prisons halves the number of new infections in that setting.

The Surveillance and Treatment of Prisoners with hepatitis C (SToP-C) study, published in *The Lancet Gastroenterology and Hepatology*, tested over 3,600 incarcerated people and offered treatment in the case of a positive result. Hepatitis C is curable with direct-acting antiviral (DAA) therapy.

"Australia is a world-leader in hepatitis C elimination, and we are on track to meet the World Health Organization's elimination goal by 2030, thanks to DAA treatment and well-targeted access to testing and clinical care," says Professor Gregory Dore from the Kirby Institute, who is co-Chief Investigator on the study. "But, we know there are high rates of hepatitis C transmission in prisons, so it is vital that strategies are in place to test and treat incarcerated people."

The study tested the efficacy of a strategy known as 'treatment-as-prevention,' which is the principle that by implementing broad testing and treatment of an infection, transmission pathways are interrupted, resulting in fewer infections.

"The model we deployed was shown to be highly successful in reducing hepatitis C transmission in prisons, and it's a model that can be replicated across the world," says Professor Andrew Lloyd also from the Kirby Institute, and co-Chief Investigator on the study.

Using this evidence base, the researchers developed a toolkit for health service and corrections administrators, which has been welcomed by stakeholders including Steven Drew, Chief Executive Officer of Hepatitis NSW. "Critical to the achievement of hep C elimination goals is the identification of practical and effective initiatives that interrupt transmission," he says.

"SToP-C is the embodiment of a focussed, population-based, public health program that ticks the boxes in this regard. The evidence clearly supports scale up of these sorts of programs."

SToP-C was funded by the National Health and Medical Research Council and Gilead Sciences.

Significant investment puts Australia on path to hepatitis C elimination

A \$6.5 million investment in a game-changing hepatitis C testing program in September 2021, has set Australia on the path to hepatitis C elimination. The investment will support the scale up of new 'point-of-care' testing across the country, and significantly increase access to testing, treatment and cure.

Awarded by the Department of Health to the Kirby Institute, a world leader in hepatitis C research, and the International Centre for Point-of-Care Testing at Flinders University, the funding will utilise a diagnostic test that can be offered on-site at any clinic or treatment facility and confirm active infection within 60 minutes.

"One of the major barriers for increasing hepatitis C testing and treatment in Australia is that several visits to a healthcare provider are required, with multiple tests needed to confirm infection," says Professor Jason Grebely, who is leading the program at the Kirby Institute.

"Fortunately, we now have access to technology that can test for active hepatitis C infection immediately, and if the result comes back positive, we can start treatment during that same visit."

Hepatitis C has been declining in Australia since the country implemented wide access to direct acting antiviral treatments, which can cure 95 per cent of people. But, because many people living with hepatitis C are not aware of it, innovative methods are needed to increase testing, particularly among the communities most in need, including people who inject drugs and people in prison.

"This program will ensure high-quality testing and patient care across all sites," says Professor Mark Shepard, Director of the International Centre for Point-of-Care Testing at Flinders University. "We applaud the Australian Government for investing in this program, and look forward to working with our partners to implement it over the two years."

Spotlight on a researcher: Heather Valerio

"The world is a very different place now to when I started my PhD in March 2018, and it's really reassuring to know that the fight to eliminate hepatitis C among people who inject drugs remains a priority in public health, and at the Kirby."

Heather Valerio is a PhD student with the Kirby Institute's Viral Hepatitis Clinical Research Program. She was awarded the Kirby Institute's Postgraduate Student Prize for 2021 for her paper, "Progress Towards Elimination of Hepatitis C Infection Among People Who Inject Drugs in Australia: The ETHOS Engage Study", which was published in *Clinical Infectious Diseases*.

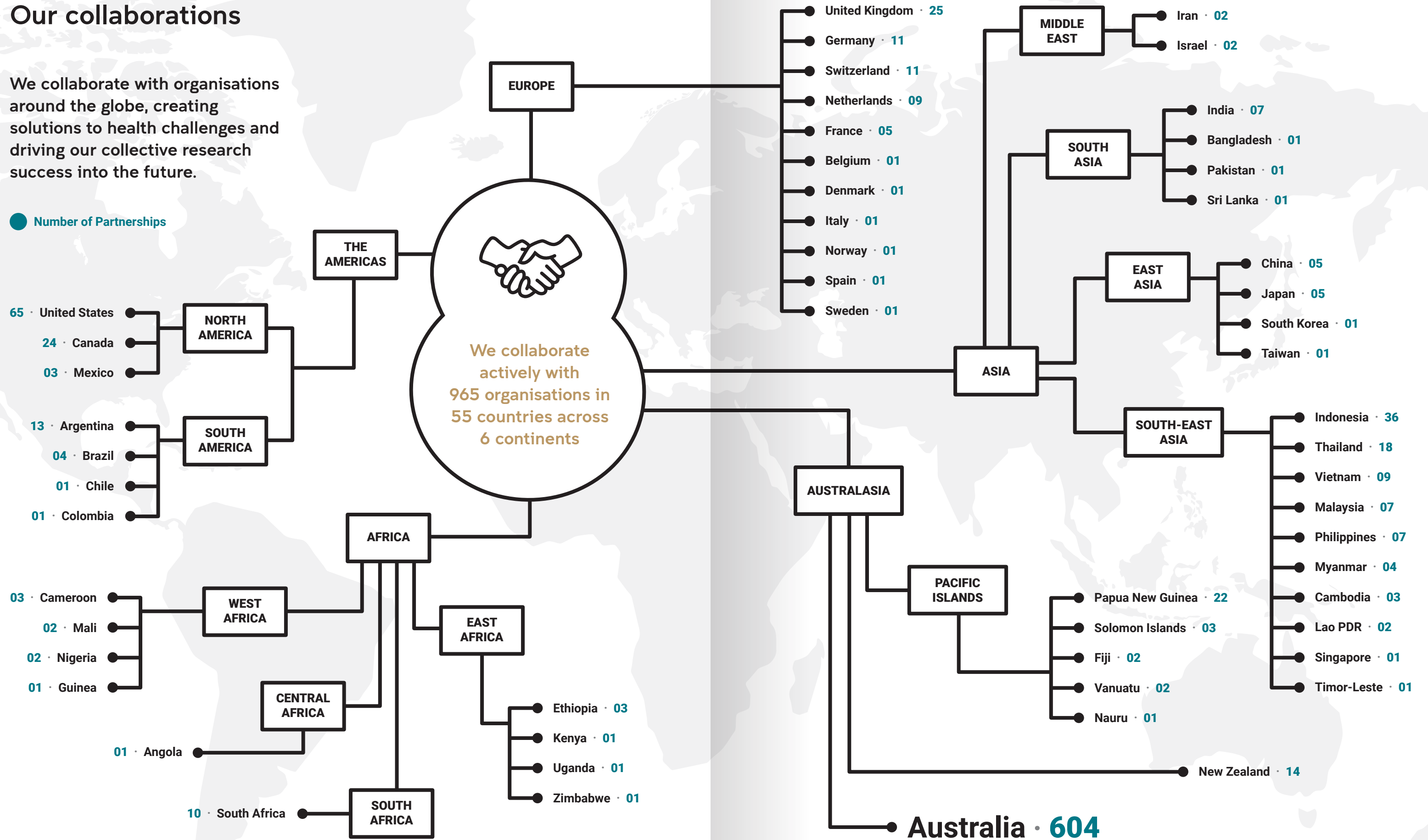


PAGE 31, TOP: Finger-prick blood sample taken to test for hepatitis C virus

Our collaborations

We collaborate with organisations around the globe, creating solutions to health challenges and driving our collective research success into the future.

● Number of Partnerships



Introducing research groups

In 2021, the Kirby Institute established research groups, which sit within our research programs. These groups are led by outstanding researchers with a track-record in independent research leadership. They reflect the growing research scope of the Kirby Institute, and our commitment to fostering the research leaders of tomorrow.

Biobehavioural Prevention Research Group



Dr Benjamin Bavinton

Our group undertakes research at the intersection of biomedical and behavioural approaches to preventing HIV transmission among gay, bisexual and other men who have sex with men and transgender women in Australia and the Asia-Pacific region.

Global Health Equity and Justice Research Group



Associate Professor Angela Kelly-Hanku

Our research is committed to decolonising global health while building a social public health system for a just and equitable response to public health challenges. We are an interdisciplinary group grounded in principles of community engagement, equitable partnerships, and improved access to health care for vulnerable and key populations globally.

Hepatitis C and Drug Use Research Group



Professor Jason Grebely

Our group undertakes internationally leading research to improve the health of people who use drugs, with a specific focus on hepatitis C infection. We conduct research which engages with affected communities, practitioners, policy makers, and other stakeholders to impact practice and policy.

Infection Epidemiology and Policy Analytics Group



Dr Deborah Cromer

The COVID-19 pandemic has brought to the forefront the importance of epidemiological models of disease and has highlighted the power these models have to shape policy decisions and influence community outcomes. Our group uses multi-scale mathematical modelling to investigate the spread of infectious disease.

Malaria Analytics Research Group



Dr David Khoury

Malaria is a health concern globally, and in particular amongst our closest regional neighbours. Despite global initiatives to eradicate malaria, it remains responsible for almost half a million deaths annually. Our team works with clinical and experimental collaborators globally with the aim of advancing our knowledge of malaria and reducing the burden of disease.

Mathematical Epidemiology and Evaluation Research Group



Dr Richard Gray

Our group uses mathematical modelling, data analysis, and other quantitative methods to investigate infectious disease dynamics at the population level. These methods are used to understand the trajectories and burden of infectious diseases and to evaluate the potential impact of public health interventions.

Neglected Tropical Diseases Research Group



Associate Professor Susana Vaz Nery

The focus of our group is to conduct research that can lead to the improvement of current strategies for control and elimination of neglected tropical diseases. To achieve that goal, we lead large-scale community-based intervention studies as well as epidemiological surveys and monitoring and evaluation.

Sexually Transmissible Infections Modelling Group



Associate Professor David Regan

The research conducted in our group focuses on using mathematical modelling to provide insights to the transmission dynamics and epidemiology of infectious diseases in high-risk and vulnerable populations and to evaluate public health interventions for their control and prevention, with a strong focus on sexually transmissible infections.

Surveillance Innovation Group



Dr Skye McGregor

Our group focuses on developing and testing innovative methods to improve public health surveillance for infectious diseases, particularly blood-borne viruses, HIV and sexually transmissible infections. Methods include mathematical modelling, data linkage, and better use of routine data, diagnostic and resistance tests.

Viral Immunity Group



Associate Professor Rowena Bull

Our group is focused on understanding the host-pathogen interaction of human RNA viruses (hepatitis C, norovirus, dengue, influenza, SARS CoV-2). We have made several seminal discoveries in the topics of virus transmission and characterisation of protective immune responses against these RNA viral infections.

Significant publications

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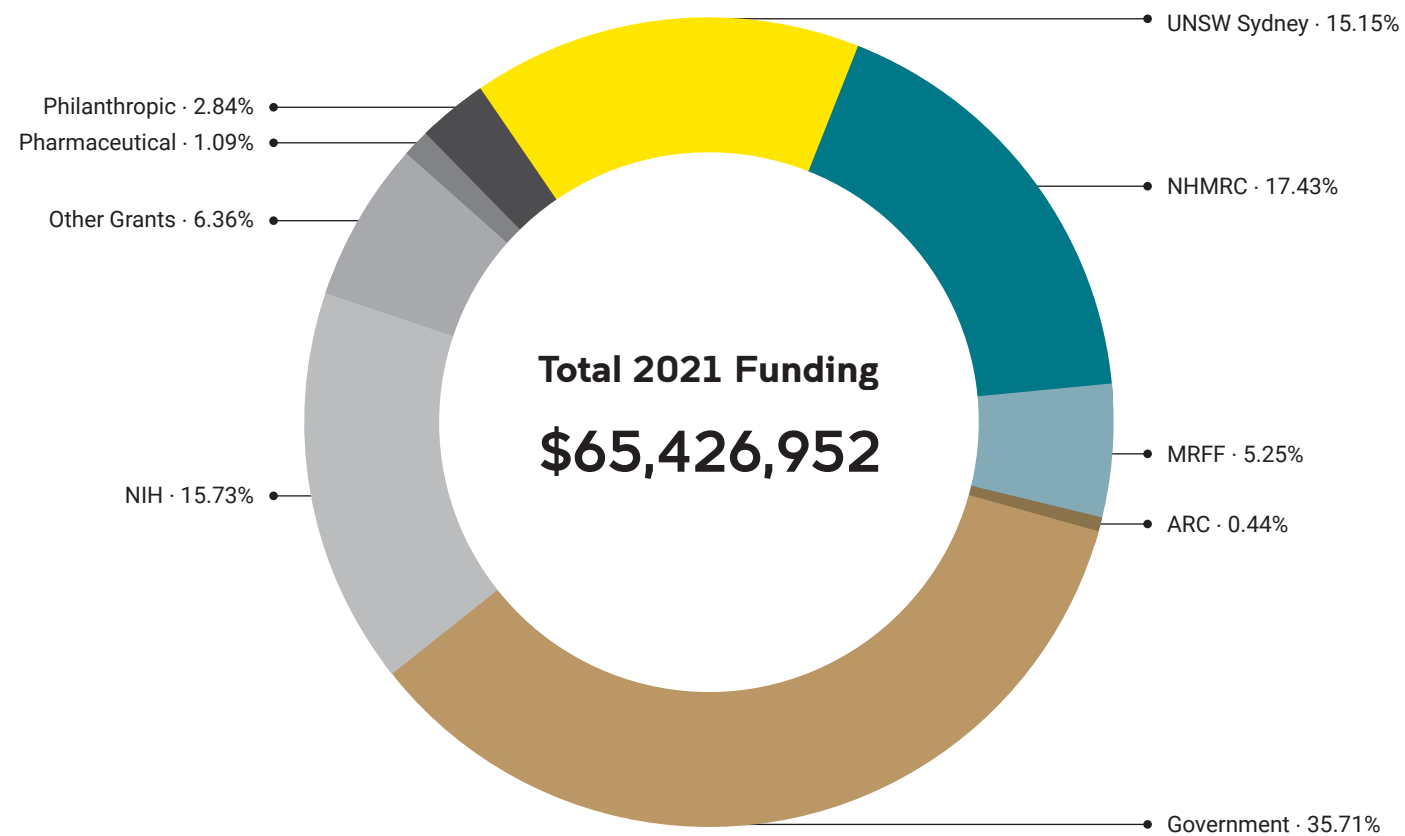
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2019	\$35,281,285
2020	\$49,495,953
2021	\$53,653,173

TOTAL DONATIONS

2019	\$549,284
2020	\$472,760
2021	\$1,859,550

		AU\$
UNSW Sydney		9,914,229
National Health and Medical Research Council (NHMRC)	Clinical Trials and Cohort Studies Grants	472,131
	Centres of Clinical Research Excellence	784,553
	Fellowships	1,886,801
	Ideas Grants	213,734
	Investigator Grants	1,751,654
	Partnership Grants	1,291,701
	Program Grants	2,275,694
	Project Grants	2,729,948
		11,406,216
Medical Research Future Fund (MRFF)	Coronavirus Research Response	1,197,963
	Emerging Priorities and Consumer Driven Research	225,952
	Frontier Health and Medical Research	500,000
	Genomics Health Futures Mission	1,509,371
Australian Research Council (ARC)	Discovery Projects	23,379
	Industrial Transformation Research Hubs	264,855
Australian Government	Federal Department of Health	16,626,373
	NSW Ministry of Health	1,630,744
	Other Government Departments	5,103,990
National Institutes of Health (NIH), USA		10,292,639
Other Grants and Contracts	Australian	1,010,789
	International	3,150,412
		4,161,201
Pharmaceutical Industry		710,490
Philanthropic Funding		1,859,550
TOTAL		65,426,952

In memoriam

In 2021, we mourned the loss of some of our longtime friends and colleagues. We pay tribute to them for their significant contributions, and will continue to be inspired by their legacies.

Professor Evelyn Lavu

Papua New Guinea's most senior pathologist and an internationally recognised leader in the fight against HIV, malaria and drug-resistant tuberculosis.

Professor Mar Mar Kyi

A leader in infectious disease research and clinical care in Myanmar, and one of the founders of the Myanmar Australia Research Collaboration for Health (MARCH).

Dr Geoff Symonds

One of Australia's leading cellular and molecular biologists and a leader in gene therapy development.

Jude Byrne

A passionate advocate for the rights of people who use drugs in Australia and globally.

Dr Paison Dakulala

An internationally recognised leader in the fight against HIV, tuberculosis and COVID-19 in Papua New Guinea.

Professor James Hakim

A global leader in HIV treatment research in Zimbabwe.

You can make a difference

Thank you to our wonderful community of supporters for your generous philanthropic support throughout the year. It is with your ongoing commitment that we are able to continue to work with at-risk communities in Australia and around the world to prevent infectious disease outbreaks and transmission, improve access to healthcare in communities impacted by infection, and train the next generation of front-line healthcare workers to improve diagnosis of infectious diseases.

Your support will ensure that the Kirby Institute can continue to carry out innovative research, working towards our vision of a world free of infectious diseases.

To find out more and make a donation, visit kirby.unsw.edu.au/donate or call +61 2 9385 0900.

PAGE 40-41: Anupriya Aggarwal in the Kirby Institute laboratories



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