Improving Health Outcomes in the Tropical North: Case Study

Tropical medicine and healthcare services are a key pillar enabling more Australians to live and work in northern Australia, and thereby expand the north's economic contribution to Australia. Through NHMRC, the Australian Government provided five years of funding to the HOT North research program, led by the Menzies School of Health Research. Headquartered in the Northern Territory, HOT North is a health research, translation and capacity building partnership that has had positive impacts in a wide range of areas. These include skin and lung infections, diabetes, mosquito-borne viral and bacterial infections, and increased community engagement in health research.

Origin

The Asia-Pacific region is a global epicentre for emerging infectious diseases and drug resistance. Growing economic integration and population movements mean that disease epidemics are likely to occur, and to reach Australia, more frequently.

The Australian Government's 2015 *Our North, Our Future: White Paper on Developing Northern Australia* included a focus on health care and medical research in Australia's tropical North.

The *Northern Australia Tropical Disease Collaborative Research Program* (NATDCRP), announced in 2015 as part of the White Paper, aims to support research into the diagnosis, treatment and prevention of tropical disease, to build strong collaborations and capacity in the health and medical research workforce, and to promote effective translation of this research into health policy and practice.

A focus of the program is on closing the gap in Indigenous health disadvantage, particularly with respect to the main diseases causing this disadvantage such as youth and maternal diabetes, rheumatic heart disease, respiratory infections and skin diseases.

HOT NORTH

Improving Health Outcomes in the Tropical North

Grants and Investment

NHMRC funding has contributed significantly to improving health outcomes in Australia's tropical north. The NATDCRP, delivered through NHMRC, provided grant funding for the *Improving Health Outcomes in the Tropical North* (HOT North) program led by Professor Bart Currie at the Menzies School of Health Research, with funding commencing in 2017. This grant was awarded through a competitive, peer reviewed process.

Research and research impacts arising from this grant have also been supported by other NHMRC funding including to:

Associate Professor (A/Prof) Asha Bowen
- Postgraduate Scholarship (PGS): 2010
- Early Career Fellowship (ECF): 2015
- Project Grant (PG): 2017
- Investigator Grant: 2020

Dr Matthew Grigg
- PGS: 2014, ECR: 2018
- Ideas Grant: 2020

Dr Pamela Laird
- PGS: 2019

Professor Louise Maple-Brown
- PGS: 2003, PG: 2009, 2015, 2019, ECF: 2010
- Partnership Project Grant: 2012
- Practitioner Fellowship: 2015
- International Collaborative Grant: 2015

Professor Anna Ralph
- PGS: 2007, PG: 2010, ECF: 2011
- Translating Research into Practice (TRIP) Fellowship: 2016
- Career Development Fellowship: 2018

Professor Scott Ritchie
- ECF: 1996, PG: 2004, 2006
- Research Fellowship: 2013

Collaborations

During HOT North's first three years, 97 research activities were established, including pilot projects, fellowships and scholarships, that were instrumental in building the capacity of emerging researchers. These researchers formed collaborations with 23 research organisations across Australia and South Asia, and more than 80 health organisations such as health departments, hospitals and Aboriginal medical services also participated in these projects.

Guided by its Indigenous Governance Committee (IGC), one third of HOT North funded projects have Aboriginal and Torres Strait Islander participation as researchers, health practitioners or in outreach roles.

Image: Chair of the IGC, Heather D'Antoine, addresses participants at the Katherine, Northern Territory, HOT North workshop. Credit: Menzies School of Health Research

HOT North established an annual series of community engagement workshops in remote towns and cities across northern Australia.

These provided opportunities for local health professionals to meet university-based researchers and discuss research ideas for closing the health gap between Indigenous and non-Indigenous Australians. By the end of 2019, 15 workshops had been conducted with 1,631 participants, and 290 presentations from Indigenous and non-Indigenous researchers.

Results and Translation

A/Prof Bowen's project – the *Antimicrobial Academy for Aboriginal and Torres Strait Islander Health Care Providers* – has developed a strategy for combatting 'superbugs' in remote health settings. Skin sores are the most frequent reason for antibiotic usage in the tropical north, but preventing resistance to those antibiotics is an emerging science that remains inaccessible to many healthcare workers.

Dr Laird's research on how to reach children at risk of chronic lung disease more quickly found that effective communication does not require expensive media campaigns but does need to work in partnership with communities and ensure the message is provided in a culturally secure way.

Led by Professor Ralph, the *Communicate* study has investigated the causes of poor communication between health care providers and Aboriginal people that results in adverse outcomes including death. This study aimed to identify remediable barriers to the use of Aboriginal interpreter services at the Northern Territory's tertiary hospital, which currently manages over 25,000 Aboriginal inpatients annually.

The *Diabetes in Youth* project, led by Professor Maple-Brown, assessed prevalence rates of type 2 diabetes in Aboriginal and Torres Strait Islander young people across the Kimberley, Northern Territory and Far North Queensland.

Professor Ritchie has worked to develop novel mosquito traps for the detection of pathogens, while Dr Grigg has conducted research in Sabah, Malaysian Borneo, into how to improve treatment and reduce transmission of zoonotic malaria.

Health Outcomes and Impact

Healthy skin research, such as the *SToP (See, Treat, Prevent) skins sores and scabies* trial led by A/Prof Bowen, has resulted in the *National Healthy Skin Guideline*, a new tool now widely used across the remote health sector to prevent and manage skin infections.

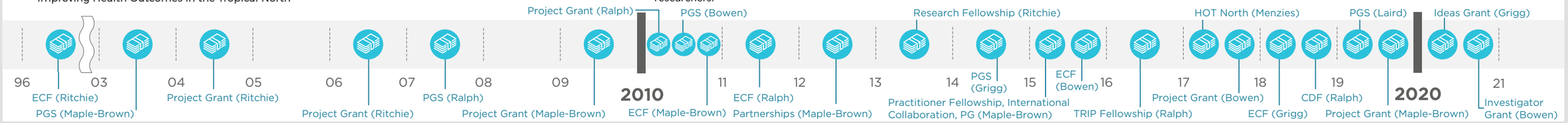
Child lung health communication tools, developed by Dr Laird in Western Australia, have begun to reverse the 'normalisation' of chronic wet cough by clinicians across northern Australia, resulting in important improvements in quality of care for children at risk of bronchiectasis.

The *Communicate* study has led to increased access to Aboriginal language interpreters at Royal Darwin Hospital. Within its first year of intervention, there was a significant decrease in self-discharge rates for Aboriginal inpatients.

The *Diabetes in Youth* collaboration has led to a marked increase in screening and diagnosis of type 2 diabetes in people under 25, with Darwin-based paediatric and adult endocrinologists receiving more referrals for young people diagnosed with the condition.

Mosquito-borne virus surveillance methods, developed by investigators in Professor Ritchie's Queensland group, are now used by multiple state and Commonwealth authorities to monitor for incursions of the Murray Valley and Japanese encephalitis viruses.

***Plasmodium knowlesi* malaria research**, undertaken by Dr Grigg and team, led to changes in Malaysian national treatment policy and provided the evidence base for updated World Health Organisation (WHO) Global guidelines and Australian malaria treatment guidelines.



A/Professor Asha Bowen

A/Prof Bowen is a Paediatric Infectious Diseases Specialist at the Perth Children's Hospital and leader of cultural transformation across the Child and Adolescent Health Service. She is also Head of Skin Health at the Wesfarmers Centre of Vaccines and Infectious Diseases, based at Telethon Kids Institute.

Recently appointed as the Institute's Program Head of Vaccines and Infectious Diseases, A/Prof Bowen's focus is on enabling the rapid translation of results from 'bush to bench to bedside'.

Dr Matthew Grigg

Dr Grigg is a post-doctoral researcher and NHMRC Early Career Fellow who has experience conducting and leading studies related to the epidemiology, diagnostics and clinical drug trials of malaria and other tropical infectious diseases in Southeast Asia, with a focus on zoonotic malaria due to the monkey parasite *Plasmodium knowlesi*.

Dr Grigg also works as a clinician in Indigenous health in Katherine, as well as previously in other remote communities in the Northern Territory.

Dr Pamela Laird

Dr Laird is a senior respiratory physiotherapist at Perth Children's Hospital with a special interest in Aboriginal paediatric chronic respiratory disease and Cystic Fibrosis. Dr Laird is the physiotherapist for the Kimberley and Pilbara Specialist Respiratory service and has over 25 years of clinical experience in treating children with chronic lung disease in both Australia and the USA. She is currently undertaking research in the Pilbara, Kimberley and Perth, with the aim of improving health outcomes for Aboriginal children by preventing chronic lung disease.

Prof Louise Maple-Brown

Professor Maple-Brown is a senior endocrinologist and Head of the Department of Endocrinology at Royal Darwin Hospital, a senior principal research fellow with the Menzies School of Health Research and chair of the Northern Territory Diabetes Network. Prof Maple-Brown established and leads the *Diabetes across the Lifecourse: Northern Australian Partnership*. The partnership includes several large NHMRC-funded projects, including the Northern Territory and Far North Queensland Diabetes in Pregnancy Partnership and The PANDORA (Pregnancy And Neonatal Diabetes Outcomes in Remote Australia) Cohort Study.

Professor Anna Ralph

Professor Ralph is Director of Global and Tropical Health at Menzies School of Health Research. She is an NHMRC Career Development Fellow and co-director of Rheumatic Heart Disease Australia, as well as being a practising medical specialist in General Medicine and Infectious Diseases at Royal Darwin Hospital.

Prof Ralph leads research programs in tuberculosis, rheumatic fever and cross-cultural communication in health care.

Professor Scott Ritchie

Professor Ritchie is Director of Field Entomology within the World Mosquito Program that has successfully deployed the bacterium *Wolbachia* to prevent dengue in 13 countries, including Australia.

Previously, Prof Ritchie was a Professorial Research Fellow in the College of Public Health, Medical and Veterinary Sciences at James Cook University, and also within the Australian Institute of Tropical Health and Medicine's Centre for Tropical Environmental and Sustainability Science.