

Infectious diseases in Northern Australia

Mark Mayo, Sean Taylor and Bart J. Currie

This issue of *Microbiology Australia* covers biomedical research and workforce training in Northern Australia and our northern neighbouring countries. The north of Australia is a tropical region and has a larger representation of Australian First Nations peoples than other States and Territories of Australia. In Australia, Aboriginal and Torres Strait Islander people represent 3.2% of the total Australian population. However, in the Northern Territory, the Australian census (2021) shows that approximately 26.3% of the total population identify as Aboriginal and Torres Strait Islander. This underpins the need for Northern Australia to have continued funding to enable health research, workforce training and health and community services that address the currently unmet and still growing needs of this population demographic.

In Australia the National Agreement on Closing the Gap for Aboriginal and/or Torres Strait Islander peoples has 17 national socioeconomic targets (<https://www.closingthegap.gov.au/national-agreement/targets>) across areas that have an impact on life outcomes for Aboriginal and Torres Strait Islander people. All the targets are important, but three targets are highly relevant to the work of clinicians and researchers writing in this issue: Target 1, Everyone enjoys long and healthy lives; Target 2, Children are born healthy and strong; and Target 7, Youth are engaged in employment or education.

In 2009, *Microbiology Australia* in its 50th year published an issue titled 'Indigenous Health' (Volume 30, Number 5, November 2009). It contained many articles that remain relevant to research and health challenges in Northern Australia. The first article in that issue was written by the then Chief Executive Officer of the CRC for Aboriginal Health Mick Gooda. Mick Gooda's paper laid out the framework for how successful research can be conducted with input from Aboriginal and Torres Strait Islander peoples: a framework that would lead to improving the flow of health information into primary healthcare delivery. The original CRCs were based in Darwin at the Menzies School of Health Research (1997–2009) and in 2010 transitioned to the Lowitja Institute in Melbourne, which continues today as Australia's National Institute for Aboriginal and Torres Strait Islander Health Research.

Research and training opportunities for local people in Northern Australia and neighbouring countries are vital to continuing the health and wellbeing of people in both urban and regional and remote locations. Strong, knowledgeable, and well developed programs are being run to attract future leaders in biomedical research and health workforce in hospitals, clinics, and Aboriginal and Torres Strait Islander

Community Controlled Health Organisations. This is a necessity to ensure a long-term sustainable approach to combating the current and future health needs of the north. This issue covers some of the different training and education initiatives in north Australia presented in the articles, **Bridging the gap between science and indigenous cosmologies: Rheumatic Heart Disease Champions4Change** (Vicki Wade and Maida Stewart), **Building health workforce capacity in Northern Australia** (Michael Johnston, Heidi Smith-Vaughan, Sophie Bowman-Derrick, Jayde Hopkins, Kelly McCrory, Raelene Collins, Robyn Marsh, Kalinda Griffiths and Mark Mayo) and **What does microbiology have to do with the Hearing for Learning Initiative (HfLI)?** (Amanda J. Leach).

As elsewhere in Australia, in Northern Australia the COVID-19 pandemic caused serious concerns for First Nations communities. The health messaging about the COVID-19 infection and vaccination was sometimes not appropriate for the population. The article **Vaccine success and challenges in northern Australia** (Bianca F. Middleton, Jane Davies and Rosalind Webby) discusses some of the challenges faced by communities.

Evidence to be gathered from the study **A project to validate the GLU test for preterm birth prediction in First Nations women** (Kiarna Brown, Holger W. Unger, Margaret Peel, Dorota A. Doherty, Martin Lee, Agatha Kujawa, Sarah Holder, Gilda Tachedjian, Lindi Masson, Jane C. Thorn, John P. Newnham and Matthew S. Payne) will inform health service providers and address Closing the Gap strategy Target 2, whereby children are born healthy and strong.

Biomedical research in Northern Australia and neighbouring countries and other tropical regions of the world continues to develop and produce new knowledge. In these tropical regions the social determinates of health play a big role in health outcomes: from poverty, reduced health service delivery, remoteness, shorter life expectancy, social and emotional wellbeing, and economic growth. Infectious diseases represent many challenges including pathogen identification, optimum treatment and increasing antimicrobial resistance. Climate change is occurring on a global scale and with projected increases in temperature and severe weather events, the endemic regions for some infectious agents is predicted to expand into newer areas and affect a larger population of people. It is therefore important we try to fill knowledge gaps in our understanding of these diseases. Research on infections in this issue includes **Skin health in northern Australia** (Hannah M. M. Thomas, Stephanie Enkel, Tracy McRae,

Victoria Cox, Heather-Lynn Kessar, Abbey Ford, Rebecca Famlonga, Rebekah Newton, Ingrid Amgarth-Duff, Alexandra Whelan and Asha C. Bowen) and **Melioidosis in northern Australia** (Josh Hanson and Simon Smith). The increasingly established use of technologies such as whole genomic sequencing, is helping us better understand the epidemiology, virulence and evolution of the organisms that cause these diseases. This is reflected in the articles **Molecular epidemiology of tuberculosis in northern Australia** (Ella M. Meumann and Arnold Bainomugisa) and ***Staphylococcus aureus* and *Streptococcus pyogenes* in the north: distinctively different** (Deborah Holt and Philip Giffard).

Northern Australian researchers continue to strengthen ties with our collaborators in near-neighbouring countries in

Strong relationships between the Northern Territory of Australia and Timor-Leste (Nevio Sarmento, Tessa Oakley, Endang Soares da Silva, Ari Tilman, Merita Monteiro, Lucendar Alves, Ismael Barreto, Ian Marr, Anthony D. K. Draper, Gloria de Castro Hall, Jennifer Yan and Joshua R. Francis) to better understand and tackle the health challenges in our tropical region of the world.

This issue covers and discusses a broad range of health challenges faced in Northern Australia, with articles providing strong research plans, outcomes, generated knowledge and research translation from teams of dedicated researchers. The issue also outlines training and education pathways to mentor and deliver future leaders in the health and biomedical research workforce.

Biographies



Mark Mayo is of Aboriginal and Torres Strait Islander heritage whose great grandmother, Polly Warrumbul, was a Mudpurra woman from Wave Hill. Mark's Torres Strait Islander heritage comes from the descendants of the people of the islands of Mabuiag and Badu in the Torres Straits. Mark is a graduate of Charles Darwin University and is a research scientist with over 30 years' experience.

Mark's interests in Australian First Nations people's health has led him to work on many research projects during his time at the Menzies School of Health Research from malaria, melioidosis, petrol sniffing and childhood ear diseases. Mark's primary research area has been melioidosis, a potentially fatal tropical disease found in Northern Australia. Mark's research into this disease covers many different aspects, from early detection of the disease in hospital and clinical settings, to understanding the environmental niche of the bacteria and the potential exposure risks to people and animals in an endemic region. Mark is adept at identifying the implications of range of developments on Aboriginal people and potential consequences for the land (especially soil). Mark is currently the manager of the Melioidosis Research Program and Associate Deputy Director of Indigenous Leadership and Engagement at the Menzies School of Health Research.



Dr Sean Taylor is descendent of the Dauareb Tribe, one of the eight tribes of Mer Island in the Eastern Torres Strait region. Sean has over 20 years of clinical experience in Aboriginal and Torres Strait Islander health, working at different levels across Australia in a range of academic and research interest, as well as clinical practice. He started his career as an Indigenous Health

Worker in his home community of Mer (Murray) Island in the mid-1990s and later completed a Bachelor of Nursing Science, Graduate

Certificate in Health: Diabetes Management and Education, Bachelor of Health Sciences (Honours) and later a Doctor of Public Health at James Cook University. Sean currently holds joint appointments as the Executive Director Aboriginal Health for NT Health, Top End, and Deputy Director Indigenous Leadership and Engagement, Menzies School of Health Research based in Darwin and is an Adjunct Associate Professor, Public Health and Tropical Medicine with James Cook University. Sean is a member of National Health and Medical Research Council Principal Committee Indigenous Caucus and Consumer and Community Advisory Working Group and also a member of the National Partnering with Consumers Committee. He is the current Chair of NT Health, Top End, Big River and East Arnhem Partnering with Consumers Committee, Communicating for Safety Committee, Aboriginal Health Committee, Aboriginal Health Partnership Committee, LGBTQIA+ Committee and Multicultural Committee and Chair of the Reconciliation Action Plan Committee with Menzies School of Health Research and NT Health, Top End, Big River and East Arnhem. Sean is a co-investigator on multiple successful nationally competitive grants.



Bart J. Currie is an infectious diseases and public health physician at Royal Darwin Hospital and Professor in Medicine at the Northern Territory Medical Program. He leads the Tropical and Emerging Infectious Diseases team at Menzies School of Health Research. He is a member of the Technical Reference Group for the Australian Government's Regional Health Security Initiative

and chairs the APPRISE Expert Reference Panel. He was Director of the NHMRC-funded Tropical Disease Research Regional Collaboration Initiative (HOT NORTH), which finished in early 2022. He began both the Darwin Prospective Melioidosis Study and the Darwin Prospective Snakebite Study 33 years ago and both continue.



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