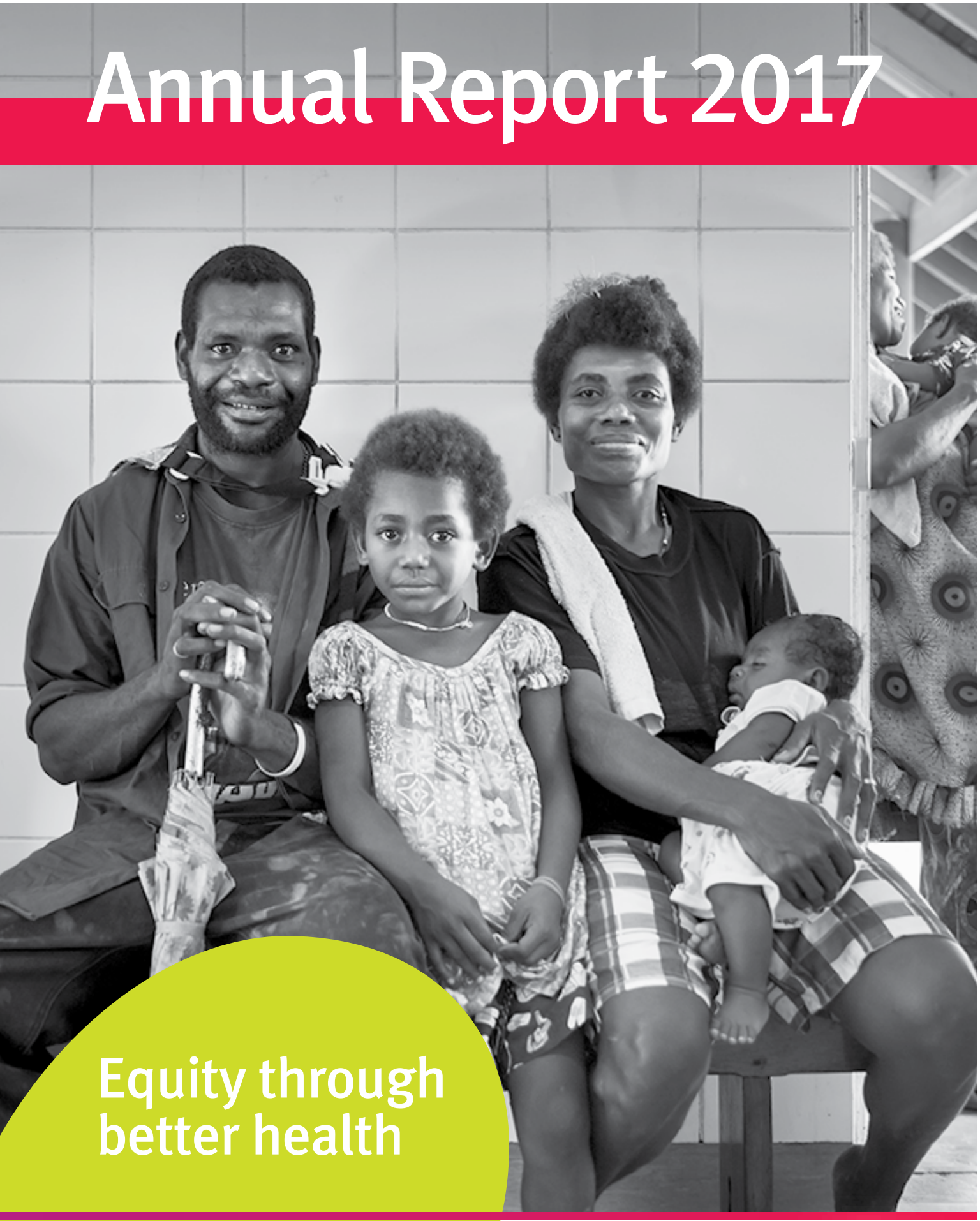
Annual Report 2017



Equity through better health

Burnet Institute
Medical Research. Practical Action.

CONTENTS

Cover: *Maternal and child health is an important focus of our work in East New Britain, Papua New Guinea.*

Director and CEO: Professor Brendan Crabb AC, BSc (Hons), PhD **Deputy Directors:** Associate Professor David Anderson, BSc (Hons), PhD; Professor Margaret Hellard MBBS, PhD; Professor James Beeson, MBBS, PhD **Company Secretary:** Mr Peter Spiller, BBus, CPA

Editorial Manager: Tracy Parish **Design:** Francis Maurice Design **Editorial Contributors:** Fran Cusworth, Paul Rathbone

Macfarlane Burnet Institute for Medical Research and Public Health Ltd (Burnet Institute) gratefully acknowledges funds received from the Victorian Government principally under its Operational Infrastructure Support Program, and from the Australian Government principally through the Department of Foreign Affairs and Trade, and the National Health and Medical Research Council (NHMRC).

Burnet is an active member of the Australian Council for International Development (ACFID), and is committed to full adherence to the ACFID Code of Conduct. Information about how to make a complaint on any breach of conduct can be found at: www.acfid.asn.au.

A full copy of the Financial Report is available on our website. Alternatively, for a printed copy please call +61 3 9282 2111. The Financial Report has been prepared in accordance with the requirements set out in the Corporations Act, 2001 and the ACFID Code of Conduct.

Burnet Institute is a member of the Association of Australian Medical Research Institutes (AAMRI), the peak body representing Australia's pre-eminent independent medical research institutes. All members of AAMRI are internationally recognised as leaders in health and medical research.

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For more information about our work, visit burnet.edu.au or call +61 3 9282 2111.

Burnet Institute is an Australian, unaligned, independent, not-for-profit organisation that aims to achieve better health for vulnerable communities throughout the world.

Our Vision

Equity through better health.

Our Mission

To achieve better health for vulnerable communities in Australia and internationally by accelerating the translation of research, discovery and evidence into sustainable health solutions.

Our Values

We are an unaligned, independent organisation that operates with transparency and respect. We are passionate about social justice, equality, evidence-based research and development, and strive to deliver excellence and health solutions through innovation, collaboration and accountability.

Year at a Glance

5
thematic programs

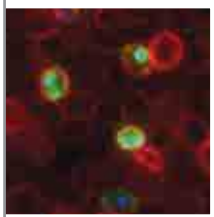
10
laboratories

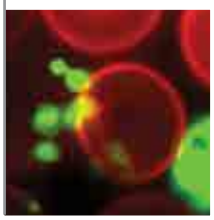
32
research working groups

90
students

January

New research collaboration with US-based GeoVax Labs, Inc. to develop a vaccine to advance our goal of eliminating malaria.





February

AUD$7 million NHMRC Program Grant to Professor Margaret Hellard (below) for research into direct-acting antivirals to help eliminate hepatitis C.

March

Burnet becomes a Program-led organisation under a new strategic blueprint – Burnet 2020.

April

New Burnet research identifies natural immunity as a potential driver of drug-resistant malaria in the Greater Mekong subregion of Southeast Asia.

May

Burnet HIV scientists identify a metabolite produced by bacteria in the vaginal tract that could help protect women at increased risk of HIV.

June

700 mothers recruited by Burnet researchers (below) for landmark Healthy Mothers, Healthy Babies study in Kokopo, Papua New Guinea.

Healthy Mothers Healthy Babies

July

Mobile Intervention for Drinking in Young People study (MIDY) adapted by Victoria University to address risky drinking.

400+
scientists, public health professionals and support staff

247
peer-reviewed publications in 2017

$13.6 MILLION
in NHMRC grants and fellowships

$45+ MILLION
spent on improving health of vulnerable communities

August

Burnet modelling by Dr Nick Scott (below) shows 2,000+ transmissions of HIV could be averted in Australia through better prevention, testing and treatment programs.

Global Health Diagnostics Laboratory, led by Ms Mary Garcia and Associate Professor David Anderson (above) wins prestigious Longitude Prize Discovery Award for point-of-care sepsis test.

September

Landmark Burnet study shows malaria link to 200,000+ stillbirths in sub-Saharan Africa.

October

Professor James Beeson (below) and Associate Professor Freya Fowkes (below left) awarded Chief Investigator roles with the Centre for Research Excellence in Malaria Elimination.

Burnet researchers awarded a further AUD$3.84 million in NHMRC Project grants.

November

Burnet's 1st Microbiome in Sexual, Maternal and Child Health Symposium, convened by Professor Gilda Tachedjian (below left), is held.

Dr Suman Majumdar (above) calls for increased TB operational research at WHO Global Ministerial Meeting in Moscow.

December

Omega Diagnostics and Burnet Institute announce commercial release of VISITECT® CD4 point-of-care HIV test.

Chair's Report

IT IS WITH GREAT PLEASURE THAT I PRESENT THIS ANNUAL REVIEW. THE PAST YEAR WAS AN EXCITING AND CHALLENGING TIME FOR THE INSTITUTE AS WE ROLLED OUT OUR BROAD RANGE OF RESEARCH AND PUBLIC HEALTH PROGRAMS AIMED AT ACHIEVING BETTER HEALTH FOR VULNERABLE COMMUNITIES IN AUSTRALIA AND INTERNATIONALLY.

The challenges faced by these communities were highlighted recently by board member visits to our rural and remote program locations in Papua New Guinea (PNG). In Australia we have one of the best health services in the world, and it is both a privilege and our role as board members to support the Institute and its in-country partners in building knowledge and capacity to achieve better health for those vulnerable populations whose health systems need strengthening and support.

There are many highlights from the year that I could discuss in this report, but three underscore the important work of the Institute particularly well.

The first is the tremendous work being done by our clinicians and public health staff in Daru, PNG, in their endeavours to manage an outbreak of multidrug-resistant tuberculosis (MDRTB). Daru has one of the highest rates of infection with MDRTB in the world, and Burnet aims to reduce transmission through the implementation of active case finding, linkage to effective treatment, and scale-up of treatment for latent TB infection. This work, funded through the Australian Department of Foreign Affairs and Trade (DFAT), will make a huge impact in controlling the spread of infection within the community.

The second major initiative is one strongly aligned with the Institute's mission. That is the State Government's decision to trial a supervised drug-injecting facility (SIF) in inner Melbourne, where dozens of lives have been lost to heroin overdoses in recent years. Burnet has been at the forefront of working with vulnerable populations including people who inject drugs (PWID) for more than 30 years. Over this time Institute researchers have developed strong networks within the injecting community, enabling collection of robust research data which has helped inform policy development aimed at improving the health of PWID and the broader community.

The third is Omega Diagnostics and Burnet's announcement, late in 2017, of the commercial release of the VISITECT® CD4 point-of-care test. This followed successful performance evaluations of the test in India and the UK, and conformity with health, safety and environmental protection standards, resulting in issuing of CE Mark accreditation. This is a major achievement for all those who have worked to develop the test kit over the past 10 years, especially Associate Professor David Anderson and colleagues Professor Suzanne Crowe AM and Ms Mary Garcia. The CD4 test is the world's first instrument-free and affordable rapid test for determining CD4 threshold in people living with HIV, and will enable patients in resource-poor settings to access testing more easily without the need for investment in equipment or highly technical scientific staff to operate. The World Health Organization described this as one of the most significant developments in the global war on HIV and AIDS.

Our capacity to undertake many of the programs at the Institute is due to the support of our funding bodies. I want to acknowledge the support of the National Health and Medical Research Council, the Department of Foreign Affairs and Trade and other organisations that support

the Institute's work. A special thank you to the Victorian Government Department of Economic Development, Jobs, Transport and Resources for its support of the Institute through the Operational Infrastructure Support Scheme. We were delighted the government responded to the challenge of increasing costs of medical research by providing an additional AUD$8 million to the scheme in the 2017/2018 budget, to be shared across all Victorian medical research institutes. Together with additional promised future funding increases, this will provide tangible and practical benefits to improving the health of communities not only in Victoria but across Australia and internationally.

Financially the Institute is in a good position, the result of solid performance from our two commercial entities Nanjing BioPoint and 360biolabs, the leasing returns from the property at 99 Commercial Road, and strong philanthropic support. Both Nanjing BioPoint and 360biolabs are strategically important to the Institute with potential to continue to grow and drive strong financial returns over the medium to long term. In addition, strong financial oversight by management, streamlining and cost efficiencies achieved through sharing of resources with Alfred Medical Research and Education Precinct partners and other collaborators, and rationalisation of some corporate services such as IT, facilities management and purchasing, have delivered substantial savings to our bottom line.

I thank the many donors and supporters of the Institute for their incredible generosity during the year. I also acknowledge the many corporations which have also provided funding or in-kind support, especially to our Healthy Mothers, Healthy Babies program in Papua New Guinea. It has been very gratifying seeing the number of PNG-based organisations getting behind such a worthwhile cause.

Thank you also to retiring Board members Mr Garry Hounsell and Professor Mike Toole AM for their outstanding contributions to the Institute. Garry's business background and financial expertise and Mike's international development focus have been strategically important to the Institute's growth, and their advice and counsel has been greatly valued and appreciated. We welcomed Ms Alison Larsson and Ms Miche Paterson to the Board during the year. Both will bring significant additional skills, enhancing the breadth of talent already present on the Board. Alison is former Chief Risk Officer with ANZ and Miche a partner (Head, Corporate and Finance) with Newgate Communications (Australia).

Thank you to all the staff of Burnet Institute ably led by Director and CEO Professor Brendan Crabb AC. I am constantly in awe of the tremendous contributions made by everyone at the Institute, especially challenging during a time of organisational change.

Mr Robert Milne
Chair

In Appreciation

THANK YOU TO EVERYONE WHO SUPPORTED US.

Gifts in wills

Gifts in wills, or bequests, provide important long-term security for our ongoing research and public health programs. We thank the late Doreen Elizabeth Ashley-Brown, Lois Elizabeth Dalziel, Margaret June Flower, Mavis Jean Lay, Alan George Lewers Shaw, Marion Spence, and Winifred Daisy Stevens for their generous and thoughtful bequests to the Institute.

Trusts and Foundations

Thank you to the charitable trusts and foundations that support us:

- Alfred Felton Bequest
- Andrews Foundation
- Colonial Foundation Limited
- Drakensberg Trust
- Eirene Lucas Foundation
- Hon Geoffrey Connard AM Travelling Scholarship (a charitable fund account of Equity Trustees Foundation)
- Harold Mitchell Foundation
- Hopetoun Fund (a sub-fund of Australian Communities Foundation)
- Joe White Bequest
- Joyce Adelaide Healey Charitable Trust Fund
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- Violet Norma Sanders Trust
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- William Buckland Foundation
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Thank you to the corporations that support us:

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- Lamana Group of Companies
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- Sing Wo Sons
- SP Brewery
- Tropicana

Director's Report

THE PAST YEAR WAS AN EXCITING TIME FOR THE INSTITUTE AS WE IMPLEMENTED BURNET 2020, OUR AMBITIOUS NEW STRATEGIC PLAN.

This has meant a radical transformation for the Institute, and a new way of thinking and working, the result of an in-depth review in 2016 and extensive discussions with internal and external stakeholders. Our focus remains on improving the health of vulnerable communities in Australia and internationally. To be a more effective organisation, we have moved away from a siloed structure and brought our laboratory researchers, public health professionals and international development staff together in a more collaborative and enabling framework. The new structure allows us to take full advantage of our expertise at the Institute in addressing major global health issues across maternal and child health, disease elimination, behaviours and health risks, healthy ageing and health security.

I'm delighted to report the new structure and Burnet 2020 has been well received across the Institute and among our many donors, partners and collaborators. A special thanks to all staff involved in managing the transition, who worked extraordinarily hard, over and above their normal duties, to achieve a great long-term strategic advance for Burnet.

While the Institute has performed strongly across all areas, there are several program highlights I would like to mention. Our flagship program in Papua New Guinea (PNG), Healthy Mothers, Healthy Babies (HMHB), part of our Maternal and Child Health Program, achieved a significant milestone with the recruitment of 700 women into the first of five studies, and post-delivery checkups are well underway. Already we are finding significant health issues such as high levels of anaemia and infectious disease burdens – major challenges for pregnancy and newborn health outcomes. Once analysis has been completed we will be in a position to identify key interventions to improve outcomes for mothers and their babies. I would like to acknowledge the support of our many HMHB partner organisations, especially the PNG National Department of Health and Provincial Health Office in East New Britain, as well as the PNG Institute of Medical Research. In addition, the philanthropic support provided from many individuals and corporations, especially our Principal Supporter Bank South Pacific, has been critical in enabling this project to proceed. HMHB is purely philanthropically funded, so we really appreciate the continued support for this important work. Our work in PNG has also been enhanced by the signing of a partnership agreement with Oil Search Foundation, who share our long-term commitment to improve the health and lives of Papua New Guineans.

Our disease elimination program is progressing well on several fronts. The elimination of hepatitis C project, part-funded with a AUD$7million National Health and Medical Research Council (NHMRC) program grant led by Professor Margaret Hellard, is working with at-risk communities to prevent infection and support access to treatment with highly effective direct-acting antiviral drugs. This project is complemented by our strong hepatitis C vaccine program led by Associate Professor Heidi Drummer.

> "Burnet brings together a highly diverse skill base through our international and local field presence, our laboratories, and our mixed development and research cultures, to drive greater focus on the most relevant global health issues."
>
> **PROFESSOR BRENDAN CRABB AC, BURNET DIRECTOR AND CEO**

We continue to focus on HIV research and public health, with modelling undertaken by Burnet demonstrating that more than 2,000 transmissions of HIV could be averted in Australia over the next three years through better prevention, testing and treatment programs. This data supported a successful bid to have PrEP drugs listed on the Pharmaceutical Benefits Scheme, which will be a major tool in HIV elimination in Australia.

Two of our senior malaria researchers, Professor James Beeson and Associate Professor Freya Fowkes, have also won leading roles as Chief Investigators in a new AUD$2.5 million NHMRC Centre for Research Excellence in Malaria Elimination. The focus will be on development of malaria vaccines and new drugs to combat the disease.

We welcomed the formation of the Indo-Pacific Centre for Health Security, announced by the Minister for Foreign Affairs and Trade, the Hon Julie Bishop MP, in October 2017. This new initiative will focus on addressing the key challenges of existing and emerging infectious diseases for Australia and our region and is arguably one of the most significant investments in regional health in a decade. The Initiative includes an investment of AUD$300 million over five years to support efforts to prevent and contain disease outbreaks with potential to cause economic impacts on a national, regional or global scale. We look forward to working collaboratively with the new Centre.

We continued to meet or exceed our key measures of success. We published 247 peer-reviewed publications and reports in 2017; experienced higher-than-national-average grant success with the NHMRC at more than 33 per cent; and informed government policy and strategy development through our research activities.

I extend my thanks to all staff at the Institute for their outstanding contributions during the year and their patience and understanding as we transitioned to the new structure. Special thanks to Mark Tennent, our in-coming Chief Operating Officer, for his support and advice.

Thank you to the Board for their amazing contributions during the year and to our Chair Mr Robert Milne for his guidance and support. The specialist skills provided voluntarily by the Board play an enormous role in ensuring the good governance, financial oversight and ultimately the long-term sustainability of the Institute.

Thank you to all those who provided the Institute with philanthropic support during the year. Your donations assisted many of our researchers and their programs, enabled the purchase of new technologies, and led to many new initiatives. Thank you also for your many words of encouragement – they are much appreciated by all at Burnet.

Professor Brendan Crabb AC
Director and CEO

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CHAIR

Mr Robert L. Milne

DIRECTOR AND CHIEF EXECUTIVE OFFICER

Professor Brendan Crabb AC

DIRECTORS

Mr Robin Bishop

Professor Peter Colman AC

Mr Ross E. Cooke

Associate Professor Helen Evans AO

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Mr Garry Hounsell

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Professor James Beeson
Professor Margaret Hellard

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Professor James Beeson
Deputy Director (People)
Professor Margaret Hellard
Deputy Director (Programs)
Mr Geoff Drenkhahn
Head of Business Development and Commercial Operations
Mr Mark Tennent
Chief Operating Officer
Ms Mary-Ann Nicholas
Project Management and Quality Assurance

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Maternal and Child Health
Associate Professor Heidi Drummer
Disease Elimination
Professor Paul Dietze
Behaviours and Health Risks
Dr Ben Coghlan
Health Security
Professor Suzanne Crowe AM
Healthy Ageing

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Maternal and Child Health
Mr Chad Hughes and Dr Joseph Doyle
Disease Elimination
Dr Megan Lim and Ms Lisa Davidson
Behaviours and Health Risks
Dr Suman Majumdar
Health Security
Dr Anna Hearps
Healthy Ageing

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Head, Life Sciences
Associate Professor Mark Stoové
Head, Public Health
Dr Chris Morgan
Head, International Development

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Professor Robert Power
Head, International Operations
Mr Peter Spiller
Chief Finance Officer, Company Secretary
Mr Paul Rathbone
Head, Public Affairs and Development, Government Relations
Mr Paul Duffy
Head, Human Resources
Mr Ian Briggs
Chief Technology Officer
Associate Professor Bruce Loveland
Head, Research Support and Facilities
Dr Margarete White
Manager, Occupational Health and Safety

Resigned as Director during 2017 or since year end: Professor Michael Toole AM, Director from 2011-2017. Mr Garry Hounsell, Director from 2013-2017.

Community Engagement

Our annual Day of Immunology offers the general public laboratory tours and scientific presentations.

Political leaders show support for Burnet's Healthy Mothers, Healthy Babies program at a dinner in Port Moresby, Papua New Guinea (PNG). (L-R) Burnet supporter Ms Chloe Bryce-Shorten, Australian Opposition Leader The Hon Bill Shorten MP, PNG Prime Minister The Hon Peter O'Neill MP, Burnet Director and CEO Professor Brendan Crabb AC and Burnet patron Dame Carol Kidu, DBE.

A Burnet lunch to mark 2017 International Women's Day. (L-R) Maternal and Child Health Program Director Dr Elissa Kennedy, Executive Director of the Oil Search Foundation Stephanie Copus-Campbell, Disease Elimination Program Director Associate Professor Heidi Drummer, Dr Annemarie Laumaea and Burnet Board member Associate Professor Helen Evans AO.

AMREP Student Night 2017: Burnet researchers describe the Institute's work to potential students.

Burnet staff Dr Joseph Doyle, Associate Professor Heidi Drummer and Dr Alisa Pedrana at the 2017 Eliminate Hepatitis C Symposium.

Field Technical Coordinator, Daru, Dr Pilar Alonso during World TB Day celebrations in Papua New Guinea.

Acts from the Melbourne International Comedy Festival feature at Burnet fundraiser, Infectious 2017. Pictured: Demi Lardner.

Donors gather to learn more about Disease Elimination and Burnet's HIV research.

Burnet's stall at the 2017 Midsumma Festival, where research staff mingle with festivalgoers.

Eliminating Hepatitis C is Possible

HEPATITIS C VIRUS (HCV) CAUSES A CHRONIC INFECTION OF THE LIVER AFFECTING 70 MILLION PEOPLE GLOBALLY, RESULTING IN INFLAMMATION LEADING TO FIBROSIS, CIRRHOSIS AND SOMETIMES CANCER. EACH YEAR, BETWEEN 350,000 AND 500,000 PEOPLE DIE FROM HCV-RELATED ILLNESS. MORE THAN 200,000 AUSTRALIANS LIVE WITH CHRONIC HEPATITIS C INFECTION.

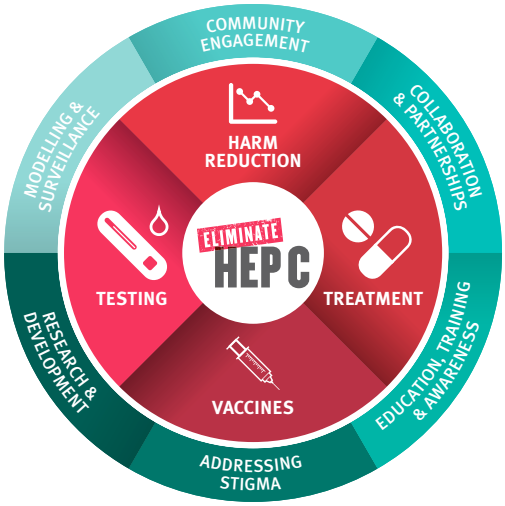
New highly effective therapy for hepatitis C virus direct-acting antiviral medications (DAAs), means that hepatitis C can now be cured – in many cases with just a tablet a day for eight to 12 weeks. It is no longer a disease carried for life. In March 2016, the Australian government began subsidising DAA treatment, making it possible for Australia to become one of the first countries to eliminate hepatitis C as a public health threat.

Since March 2016 over 40,000 Australians have received subsidised hepatitis C treatment, with an estimated 95 per cent cured, keeping Australia on track to achieve the World Health Organization's (WHO) global elimination goals.

Burnet's Eliminate Hep C strategy draws on the Institute's strengths in biomedical science, vaccine research, public health, harm reduction and data modelling, and involves several innovative research collaborations with leading figures in the field.

A flagship program at Burnet, Eliminate Hep C achieved many highlights in 2017:

- Burnet Institute Deputy Director Professor Margaret Hellard was appointed Co-Chair of the WHO Strategic and Technical Advisory Committee on HIV and Viral Hepatitis. She also presented Burnet's research on hepatitis C elimination at the International AIDS Conference in Paris and the World Hepatitis Summit in Sao Paulo, Brazil.
- Burnet's annual World Hepatitis Day Symposium gathered experts in the field to address local and global priorities and identify new effective ways to test and treat more people living with hepatitis C.
- A collaboration was established with Myanmar Liver Foundation's Dr Khin Pyone Kyi and Medical Action Myanmar's Dr Ni Ni Tun on a hepatitis C community-based test-and-treat project funded by global health agencies FIND (The Foundation for Innovative New Diagnostics) and Unitaid, starting in 2018.
- Our paper 'Reaching hepatitis C virus elimination targets requires health system interventions to enhance the care cascade', in the *International Journal of Drug Policy*, led to local implementation projects such as the NHMRC Eliminate C Partnership. Researcher Dr Nick Scott was awarded a Young Investigator Bursary for this work.
- Led by Associate Professor Heidi Drummer, Burnet researchers secured a three-year National Health and Medical Research Council (NHMRC) grant to investigate how combining Burnet's HepSeeVax technology with a leading viral vector vaccine delivery platform developed by Professor Eleanor Barnes at Oxford University could generate protective immunity against all genotypes of HCV. Associate Professor Drummer also secured funding from the Australian Centre for HIV and Hepatitis Virology to optimise vaccine formulation, an important step prior to human clinical trials.



Above: Professor Margaret Hellard co-chairs the World Health Organization's Strategic and Technical Advisory Committee on HIV and Viral Hepatitis in Geneva.

PROJECTS

EC Partnership

The Eliminate Hep C Partnership (EC Partnership), funded by the NHMRC and Gilead Sciences, involves researchers, government, health services and community organisations. Combining health promotion, education and health systems strengthening, the EC Partnership aims to increase hepatitis C testing and treatment in community-based settings, particularly focusing on people who inject drugs.

TAP STUDY

The Treatment as Prevention (TAP) study examines the feasibility of specialist nurses providing hepatitis C treatment in community settings using a mobile van. The study uses an innovative social network-based approach where people who inject drugs and their injecting partners are treated at the same time.

The Prime Study

The Prime Study is a randomised study comparing hepatitis C treatment uptake and outcome in a primary health care service with treatment in a hospital setting, using nurse-led models of care.

co-EC study

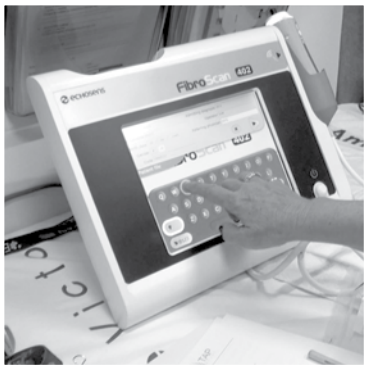
The co-EC study aims to test, treat and cure gay and bisexual men who are infected with both hepatitis C and HIV, and measure the impact on hepatitis C infection and reinfection.

ACCESS

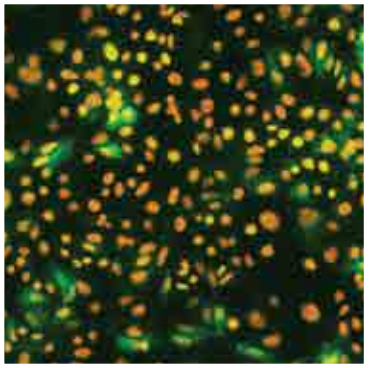
The Australian Collaboration for Coordinated Enhanced Sentinel Surveillance (ACCESS) is a partnership between Burnet and Kirby Institute, predominantly funded by the Australian Department of Health. ACCESS is the only system in Australia capable of capturing clinical and laboratory data on HCV testing and treatment.

HepSeeVax

Burnet has developed a hepatitis C vaccine that is in late preclinical development (HepSeeVaxDelta3™). The vaccine was created by researchers at Burnet Institute, led by Associate Professor Heidi Drummer, and has the potential to provide protection against all circulating strains of HCV. It may be used to prevent first-time HCV infection or reinfection, and could accelerate and reduce the cost of achieving HCV elimination.



Above: The TAP study takes hepatitis C treatments to community settings in a mobile van.



Above: Hepatitis C virus infected liver cells, stained green.

Healthy Mothers Healthy Babies

Healthy Mothers, Healthy Babies

700 pregnant women
enrolled into the Mothers and Babies Follow-up Study

All mother and baby pairs seen
after delivery
and at
1 month
after delivery

2,600+
visits with study participants

3,800+
finger-prick rapid tests
for anaemia

3,800+
rapid diagnostic tests
for malaria

MATERNAL AND CHILD MORTALITY STATISTICS IN PAPUA NEW GUINEA (PNG) ARE HEARTBREAKING.

Each year more than 5,000 newborn babies die and more than 1,500 women lose their life from childbirth related causes.

Burnet's innovative research program Healthy Mothers, Healthy Babies (HMHB) aims to save lives and improve health and wellbeing in PNG. Four years into HMHB's research, major progress is being made in understanding the causes of poor maternal and child health and identifying potential interventions.

Each year, more than
5,000 babies die
before they reach
ONE MONTH

A special thank you to Bank South Pacific, Principal Supporter of Healthy Mothers, Healthy Babies.

Above: Researchers Benishar Kombut and Dukduk Kabiu process samples at the HMHB lab in Kokopo.

Above: A mother speaks to HMHB research officers Rose Suruka (centre) and Lucy Au (right).

HMHB is based in Kokopo, East New Britain and is a partnership with the East New Britain Provincial Health Authority, PNG Institute of Medical Research, National Department of Health, University of PNG, Kirby Institute and local health facilities.

To obtain crucial data, HMHB researchers often drive long distances on difficult roads to track women from their first antenatal clinic visit through to delivery and the baby's first year of life. They carry out health checks on mothers and babies at one, six and 12 months of age as part of the first major study – the Mothers and Babies Follow-up Study. At each checkup they collect blood and other samples to test for infections and nutritional deficiencies, as well as conducting interviews to understand the barriers women face during pregnancy and childbirth.

Testing mothers and babies through the first year of new life

In new developments in 2017, HMHB reached its first major target of enrolling 700 pregnant women to participate in the Mothers and Babies Follow-up Study. By December, all mothers and babies had been seen at delivery and at one month postpartum, with a further 480 seen at six months and 135 at 12 months.

Burnet HMHB Principal Investigator Professor James Beeson said completion of the one-month follow-up visits was a major milestone.

"That's important because it is the end of the neonatal period, the period of highest risk for the infant," he said.

"A high proportion of childhood deaths occur in the first five years of life and of these, around half are in the first month of life."

Over 2,600 visits have been conducted with study participants, each involving a detailed questionnaire, collection of biological specimens and a health check. Testing for anaemia and malaria can provide results to the mother on the spot, and blood samples and vaginal swabs are taken to test for genital tract infections. Infant nutrition, growth and development are closely monitored, with low birth weight and childhood stunting (poor growth and development) a major focus.

In addition, the HMHB team completed the first phase of health service assessments, evaluating services provided to mothers and infants in the postpartum period and during infancy by health clinics and hospitals in the province. This has provided important insights into how health services could be modified to maximise health benefits.

HMHB has a strong relationship with local health authorities in East New Britain and regularly reports on progress. This has already helped create change. For example, an interim report helped provincial leadership recognise a major gap in the use of health care immediately after childbirth.

This study, the first of several that make up the HMHB program, is expected to be completed by November 2018.

Our health team

As well as working to save lives and improve health for mothers and babies, Burnet's work is improving health capacity in PNG. Dozens of local research staff and health care workers have been trained in skills such as taking samples and performing tests, taking accurate baby measurements, carrying out laboratory techniques, first aid and computing skills.

PRINCIPAL SUPPORTER:

BSP

PARTNERS:

PAPUA NEW GUINEA INSTITUTE OF MEDICAL RESEARCH

EAST NEW BRITAIN PROVINCIAL GOVERNMENT

NATIONAL DEPARTMENT OF HEALTH

The UNIVERSITY OF PAPUA NEW GUINEA

Kirby Institute

Towards Eliminating HIV

> "The future of HIV treatment is medication that will suppress the virus for a long time and keep inflammation at bay."
>
> **DR CLOVIS PALMER, HEAD OF THE PALMER LABORATORY**

MORE THAN 36.7 MILLION PEOPLE LIVE WITH HIV GLOBALLY, INCLUDING MORE THAN 25,000 AUSTRALIANS. ONCE CONSIDERED A DEATH SENTENCE, 46 PER CENT OF PEOPLE LIVING WITH HIV ARE NOW RECEIVING LIFE-SAVING ANTIRETROVIRAL TREATMENT.

Eliminating HIV has been a key research focus at Burnet since the first clinical cases emerged almost 40 years ago in the 1980s. Our wide-ranging HIV work in public health and medical research includes surveillance, diagnostics and drug development, prophylaxis, vaccines, clinical training and testing. We work in supportive partnerships with many community groups and stakeholders in Australia and globally.

Ending the HIV epidemic as a public health threat in Australia is now a real possibility

Burnet is an important research and implementation partner in Australia's HIV response. We pioneered the surveillance system ACCESS, an internationally unique system that monitors progress towards Australia's HIV prevention and care targets. It measures profound shifts in early post-diagnosis HIV treatment, and monitors an internationally unprecedented expansion of HIV pre-exposure prophylaxis (PrEP). The impact of these changes will guide Australia's ongoing HIV response.

Collaboration – partnerships – prevention

We are partnering with The Alfred hospital on the PrEPX trial which is expected to significantly curtail the local HIV epidemic. With the Victorian AIDS Council, Burnet helped establish PRONTO!, Australia's first shopfront and peer-led HIV testing service, recognised as a global best practice model for community-based LGBTI services.

Modelling maximises impact of HIV programs

Data modelling led by Burnet's Head of Infectious Disease Modelling, Professor David Wilson, has strengthened the Institute's capacity to support international HIV responses. The Optima modelling group helps countries maximise the impact of HIV programs at a time when global donor funds are diminishing. Optima modelling has improved HIV responses in over 45 countries and informed regional and global discussions on HIV resourcing.

Top: Professor David Wilson, Head of Infectious Disease Modelling uses data modelling to maximise impact on HIV. Above: Burnet is a research partner in the PrEPX trial, projected to significantly impact the local HIV epidemic.

"Our study of vaginal bacteria has important implications and opens up avenues for further research which may help prevent HIV."

PROFESSOR GILDA TACHEDJIAN, HEAD OF LIFE SCIENCES

New HIV drug targets crucial

Cutting-edge research underway in Burnet's laboratories is contributing to HIV elimination and prevention efforts globally. The discovery of new drug targets for antiretroviral therapy and prevention are crucial to fight potential drug resistance. The Drummer and Poumbourios Viral Entry and Vaccines Group is exploring novel vaccine candidates, while the Tachedjian Retroviral Biology and Antivirals Group is examining the role of vaginal bacteria in protecting women against HIV, and investigating development of a new drug class. The Palmer Group is working to reduce HIV-related morbidity and mortality by understanding ageing at a cellular level.

International harm reduction programs

Burnet has worked on harm reduction programs in India and Nepal, supported HIV prevention in China, strengthened laboratory systems in Papua New Guinea and Timor Leste, and built the capacity of 30 Mozambican grass-roots NGOs to respond to HIV. It has recently provided technical assistance to support HIV service delivery and operational research in Myanmar and East Africa. Our partnership with UNICEF has helped deliver HIV prevention programs to adolescents in key populations in Tanzania, China, Iran, Mongolia, Indonesia and the Philippines. Our work creating and sustaining enabling environments for HIV prevention and care internationally has been significant.

OUR APPROACH TO HIV ELIMINATION

Investing in Adolescent Health

ADVANCES IN CHILD HEALTH HAVE CREATED THE LARGEST POPULATION OF ADOLESCENTS IN HISTORY – A DEMOGRAPHIC 'YOUTH BULGE'.

PEOPLE AGED 10-24 YEARS ACCOUNT FOR UP TO A THIRD OF THE POPULATION IN LOW- AND MIDDLE-INCOME COUNTRIES.

It's a historic opportunity to realise the 'triple dividend' of investments into this age group, with improved health outcomes for adolescents, the future adults they will become, and the children they will have.

Recognising this incredible potential, Burnet's Global Adolescent Health Group, co-headed by Dr Peter Azzopardi and Dr Elissa Kennedy, and the Young People's Health Group, headed by Dr Megan Lim, are leading several projects that address issues of critical importance to adolescent health.

"Adolescence is a time of huge opportunity – it's a developmental stage in which investments can bring about substantial improvements in health and wellbeing across the life-course."

DR PETER AZZOPARDI,
CO-HEAD GLOBAL ADOLESCENT HEALTH GROUP

> “Most of the world’s adolescents grow up in countries burdened by high rates of infectious diseases including HIV, as well as under-nutrition, adolescent pregnancy, poor maternal and child health, and poor access to essential sexual and reproductive health services.” – DR ELISSA KENNEDY, CO-HEAD GLOBAL ADOLESCENT HEALTH GROUP

Helping teens address risky drinking in Australia

The Mobile Intervention for Drinking in Young People (MIDY) study, led by Dr Lim, tested the feasibility and acceptability of a mobile phone-based intervention to deliver tailored text messages to address risky drinking in young people. Based on MIDY, Victoria University researchers in Melbourne have begun a two-year pilot targeting Melbourne University students with texts before, during and after they engage in drinking sessions.

Researching child and teen exposure to pornography

Online pornography is a significant concern for young people and their parents, but there is very little research to inform strategies to address these concerns.

A study led by Dr Lim seeks to fill critical information gaps by interviewing parents to learn their opinions on information needs and potential interventions which could address pornography-related harms.

Understanding the health and wellbeing of Australian Indigenous adolescents

Dr Azzopardi has been leading a project to better understand the health needs of Aboriginal and Torres Strait Islander adolescents in Australia, through his work with the Wardliparringa Aboriginal Research Unit at the South Australian Health and Medical Research Institute. This work, published in *The Lancet*, outlines the huge potential for population health that investments in adolescence may bring.

Preventing non-communicable disease in Indonesia

Diabetes, cardiovascular disease and mental health issues are emerging as the leading causes of poor health in Australia and globally, with many of the risk factors for these conditions arising during adolescence. Adolescent Health Officer Ms Lisa Willenberg and Dr Azzopardi, in collaboration with researchers through the Australia-Indonesia Centre, are undertaking studies to better understand and prevent non-communicable disease risk amongst Indonesian adolescents.

Improving sexual and reproductive health in Myanmar

Burnet’s Myanmar Country Program Manager Ms Lia Burns, with Dr Kennedy, is leading a five-year project to improve the sexual and reproductive health of young people. This development project aims to enhance delivery of comprehensive sexuality education in schools, create an enabling environment for young people, and improve the quality and accessibility of health services. Implementation research is embedded into the project to generate much-needed evidence about how to effectively deliver interventions in this setting.

Addressing early pregnancy and unintended pregnancy in Papua New Guinea

Adolescents are an important focus of Burnet’s flagship project, Healthy Mothers, Healthy Babies (HMHB), based in East New Britain province in Papua New Guinea. The HMHB Young People’s Study seeks to better understand the factors that contribute to early and unintended pregnancy in order to develop and test novel interventions to prevent adolescent pregnancy and associated poor health outcomes.

Main: Students in Myanmar.

Inset (clockwise): Young people in Myanmar; mobile phone-based interventions for risky drinking; young people in Indonesia and Australia.

Maternal and Child Health

Above: A mother with her baby in Myanmar.

PROGRAM GOAL: EQUITY IN MATERNAL AND CHILD HEALTH

Despite recent progress, women in low-income settings are still over 30 times more likely to die in childbirth than those in high-income settings, while children are 10 times less likely to reach their fifth birthday. Maternal and child deaths exceed six million a year globally, with most of them preventable. This remains one of the largest and most persistent inequities in global health.

Drawing on the extensive technical breadth across the Institute, the Maternal and Child Health Program aims to improve the health and lives of women and children. We target communities with a high burden of poor health, and we generate new knowledge about key contributors to these poor health outcomes. We develop and test new tools, technologies and strategies to overcome these challenges.

The Program is engaged in over 70 research and public health activities in 14 countries, with a particular focus on Papua New Guinea (PNG). Our priority is to reduce maternal and newborn mortality by targeting key infectious diseases and nutritional deficiencies that contribute to poor pregnancy outcomes, including low birth weight. However, our work also includes activities to improve sexual and reproductive health, particularly of adolescents; strengthen community and health systems to improve access and quality; and address gender inequality and gender-based violence.

KEY PROJECTS

The Last Taboo: menstrual hygiene interventions in the Pacific

The Last Taboo was the first multi-country study in the Pacific to focus on menstrual hygiene management, and was launched in September 2017. It was undertaken in Fiji, the Solomon Islands and PNG, in both urban and rural research sites. It recommended a strengthening of awareness and education to improve knowledge and challenge harmful taboos and beliefs around menstruation.

Working to reduce maternal and infant mortality in 14 countries

Left: Burnet's Dr Kyu Kyu Than researched the role of auxiliary midwives in Myanmar and found potential for them to carry out more specialised health interventions.

Above: Dr Elissa Kennedy, Program Director.

Optimising the role of auxiliary midwives to improve maternal and newborn health care, Myanmar

PhD student Dr Kyu Kyu Than completed her research into the role of auxiliary midwives in Myanmar and potential task shifting – the delegation of tasks to less specialised health workers – of maternal interventions. The administration of the drug misoprostol for prevention of postpartum haemorrhage was identified as the most feasible task to shift to auxiliary midwives.

The role of the microbiome in sexual, maternal and child health

Areas of interest in this new research area include the role of metabolites and short chain fatty acids in the post-immune response, and findings that a metabolite produced by bacteria in the vaginal tract could help protect women from contracting HIV. In 2017 Burnet held its first conference on the Microbiome in Sexual, Maternal and Child Health.

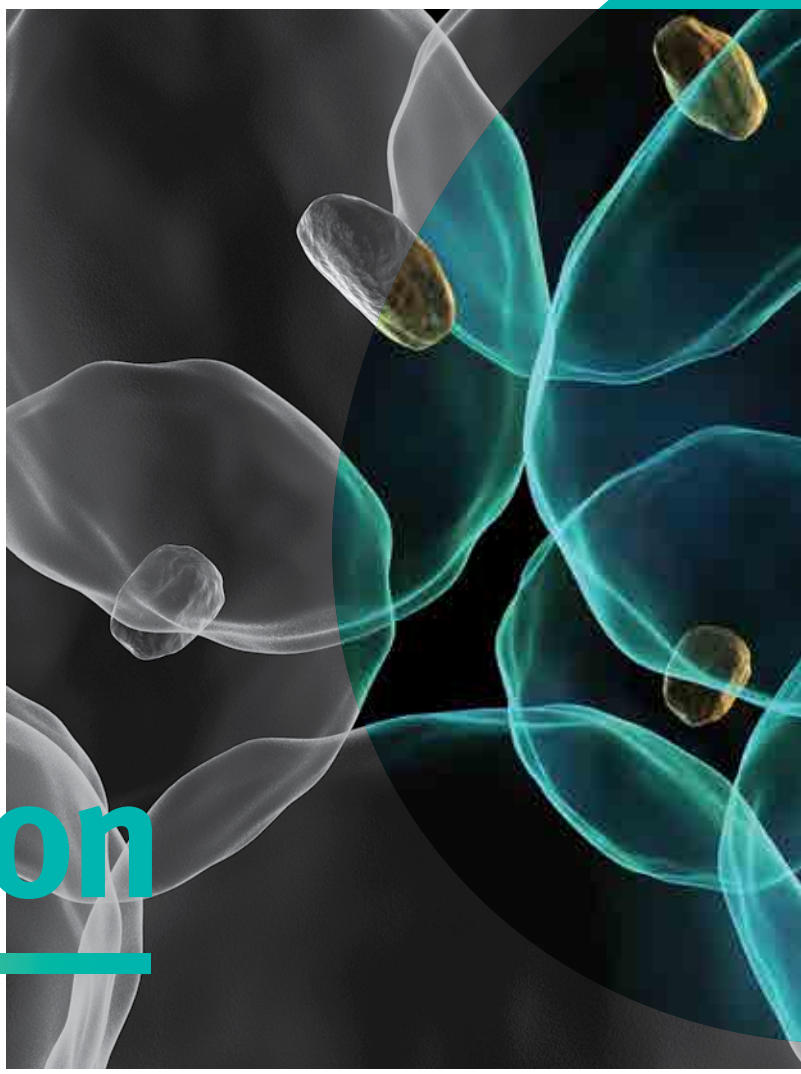
KEY PUBLICATIONS

Quantification of the association between malaria in pregnancy and stillbirth: a systematic review and meta-analysis.
Moore KA, Simpson JA, Scoullar MJL, McGready R, Fowkes FJI.
Lancet Global Health, 2017 Sep; 5(11):E1101-E1112
We aimed to quantify the association between malaria in pregnancy and stillbirth, and to assess the influence of malaria endemicity on the association. We found malaria in pregnancy increases stillbirth risk, increasing further as endemicity declines.

Health and wellbeing of Indigenous adolescents in Australia: a systematic synthesis of population data.
Azzopardi PS, Sawyer SM, Carlin JB, Degenhardt L, Brown N, Brown AD, Patton GC.
Lancet, 2017 Nov.
This landmark study described for the first time a comprehensive profile of Indigenous adolescent health, finding that mortality among this group is more than twice that of non-Indigenous adolescents, and that 80 per cent of these deaths are preventable.

Prevention of postpartum haemorrhage by community-based auxiliary midwives in hard-to-reach areas of Myanmar: a qualitative inquiry into acceptability and feasibility of task shifting.
Than KK, Mohamed Y, Oliver V, Myint T, La T, Beeson JG, Luchters S.
BMC Pregnancy Childbirth, 2017 May; 17(1):146
In resource-constrained settings the World Health Organization recommends oral misoprostol to prevent postpartum haemorrhage, a leading cause of maternal mortality. This study explored and supported using midwives to distribute misoprostol.

The Last Taboo: Research on menstrual hygiene management in the Pacific: Solomon Islands, Fiji, and Papua New Guinea.
International Women's Development Agency, Burnet Institute, Water Aid, Department of Foreign Affairs and Trade, 2017 Sep.
This landmark study of menstrual hygiene in the Pacific identified the challenges faced by women and adolescent girls in Fiji, PNG and Solomon Islands. It recommended increased awareness and education to challenge harmful taboos around menstruation.



Disease Elimination

PROGRAM GOAL: THE ELIMINATION OF HIV, VIRAL HEPATITIS, MALARIA AND TUBERCULOSIS AS PUBLIC HEALTH THREATS

Globally, more than four million people die each year from preventable infectious diseases – mainly HIV, malaria, tuberculosis (TB) and viral hepatitis B and C. These diseases are among the leading causes of morbidity and mortality in our region and affect vulnerable communities in Australia. Many of these diseases occur as comorbidities, exacerbating illness and death. An estimated 650 million people live with a chronic infectious disease, and billions more are at risk.

The Disease Elimination Program is a coordinated response focused on elimination of these four major diseases that disproportionately affect vulnerable communities and populations in Australia, Papua New Guinea (PNG), Myanmar, China and other African, Asian and Pacific countries.

Activities across 18 working groups centre on the major sub-programs: Eliminate HIV, Eliminate Viral Hepatitis, Eliminate Malaria and Eliminate Tuberculosis, with cross-program activities in Maternal and Child Health, Behaviours and Health Risks, Health Security and Healthy Ageing.

Australia's and the global response to these devastating diseases require a coordinated approach to prevent new infections and stop infectious disease-related deaths.

KEY PROJECTS

HIV services in Myanmar

In 2017, Burnet in Myanmar tested for HIV over 1,800 people who inject drugs and over 3,000 men who have sex with men. We distributed over one million needles and syringes and approximately 400,000 condoms to these key populations. These services were handed over to community-based partners at the end of 2017.

Hepatitis C elimination modelling

A geospatial analysis was performed to analyse HCV treatment uptake, and found uptake was lower in non-metropolitan areas, areas of socio-economic disadvantage and with a greater proportion born overseas. These areas also have higher HCV notification rates, indicating that they need interventions to improve treatment uptake.

New point-of-care test for malaria diagnosis

Primaquine is the only medication currently available to treat *Plasmodium vivax* parasites, but this drug can have devastating health effects in individuals born with the enzyme deficiency G6PD. Burnet researchers and Axxin Pty Ltd are developing a new test to diagnose G6PD deficiency, with a working prototype expected by the end of 2018.

Above: Associate Professor Heidi Drummer, Program Director.

Eliminate HIV

Eliminate Viral Hepatitis

Eliminate Malaria

Eliminate Tuberculosis

KEY PUBLICATIONS

Vaginal lactic acid elicits an anti-inflammatory response from human cervicovaginal epithelial cells and inhibits production of pro-inflammatory mediators associated with HIV acquisition.
Hearps AC, Tyssen D, Srbinovski D, Bayigga L, Diaz DJD, Aldunate M, Cone RA, Gugasyan R, Anderson DJ, Tachedjian G.
Mucosal Immunology, 2017 Nov; 10(6):1480-1490.
Burnet Institute has discovered that beneficial vaginal bacteria produce a metabolite that blocks inflammation. The Institute has a patent to enable translation of this discovery.

Achieving 90-90-90 HIV targets will not be enough to achieve HIV incidence reduction targets in Australia.
Scott N, Stoové M, Kelly SL, Wilson DP, Hellard ME.
Clinical Infectious Diseases, 2017, Nov.
Many countries, particularly those with low HIV prevalence, will struggle to achieve a 90 per cent reduction in HIV incidence by 2030 even if United Nations Programme on HIV and AIDS targets are met. Most will require substantially higher levels of prevention coverage and testing frequencies to reach this target.

The core domain of hepatitis C virus glycoprotein E2 generates potent cross-neutralizing antibodies in guinea pigs.
Vietheer PT, Boo I, Gu J, Mccaffrey K, Edwards S, Owczarek C, Hardy MP, Fabri, L, Center RJ, Poumbourios P, Drummer HE.
Hepatology, 2017. 65, 1117-1131.
Tests of Burnet Institute's lead HCV vaccine candidate are generating promising results.

Host immunity and the assessment of emerging artemisinin resistance in malaria.
Ataide RA, Ashley EA, Powell R, Chan JA, Malloy M, O'Flaherty K, Takashima E, Langer C, Tsuboi T, Dondorp AM, Day NP, Dhorda M, Fairhurst RM, Lim P, Amaratunga C, Pukrittayakamee S, Hien TT, Htut Y, Mayxay M, Faiz MA, Beeson JG, Nosten F, Simpson JA, White NJ, Fowkes FJI.
Proceedings of the National Academy of Sciences, 2017. Mar 28;114(13):3515-3520.
A multinational study led by Associate Professor Freya Fowkes identified natural immunity to malaria as a key factor in the clearance of the malaria parasite, but also as a potential driver of artemisinin-resistant malaria.

Behaviours and Health Risks

"Mortality rates among young Australians are now higher than in the first year of life, a reversal of historic trends."

PROFESSOR PAUL DIETZE, PROGRAM DIRECTOR

PROGRAM GOAL: PROMOTE IMPROVED HEALTH AND WELLBEING BY REDUCING HARMS RELATED TO ALCOHOL AND OTHER DRUGS, AND SEXUAL AND MENTAL HEALTH

The Behaviours and Health Risks Program focuses on key populations most vulnerable to behaviour-based health risk: people who inject drugs (PWID), young people and adolescents.

PWID experience mortality and morbidity far in excess of the general population, driven not just by their drug use but by poverty and homelessness. Similarly, mortality rates among Australian young people are now higher than in the first year of life, a reversal of historical trends and often the result of risk behaviours. This pattern occurs as teen abstention from drinking increases, suggesting a polarisation in risk behaviours across the population.

We have had major success in attracting National Health and Medical Research Council (NHMRC) grant funding in relation to research into PWID, methamphetamine use, intervention in risky single-occasion drinking, and sexual health behaviours. Over the next year we will consolidate this work and expand its reach into Burnet's focus countries, Myanmar and Papua New Guinea.

KEY PROJECTS

VMAX

The Victorian methamphetamine cohort study (VMAX) is the first study focused specifically on methamphetamine smoking in metropolitan Melbourne and regional Victoria. Established with Monash Rural Health using Colonial Foundation Trust and NHMRC funding, we have now recruited just under 750 participants and provided the first contemporary picture of regional methamphetamine use in Australia. Among other findings, our research shows that cohort members from regional areas are much more likely to be arrested than cohort members from Melbourne.

SuperMIX

The largest prospective cohort study of people who inject drugs ever conducted in Australia. Established in 2009, participants are followed up annually via direct interviews and records linked to health datasets.

Left: Professor Paul Dietze, Program Director.

Below left: MIDY is a smartphone-delivered text messaging intervention that helps young people stay in control of their drinking on a night out.

Funded by the NHMRC to 2021, SuperMIX looks at health service utilisation and drivers of cessation. In 2017 we conducted over 500 interviews with participants in and around the street-based drug markets of Melbourne, with new analyses showing that more than 50 per cent of the cohort were hospitalised within a five-year period, a rate more than double the general population.

MIDY

The Mobile Intervention for Drinking in Young People (MIDY) is a smartphone-delivered text messaging system to help young people stay in control of their drinking on a night out. In pilot work funded by VicHealth and the Australian Department of Health and Ageing, we worked with young people to develop messages. With funding from VicHealth and the NHMRC we are now trialling MIDY on a larger scale.

N-ICE Trial

This randomised controlled trial tests the safety and efficacy of N-Acetyl Cysteine (NAC) as a pharmacotherapy for treating methamphetamine dependence and withdrawal. Starting in February 2018, 180 participants recruited across three sites (Melbourne, Geelong and Wollongong) will receive either oral NAC or placebo daily for 12 weeks.

KEY PUBLICATIONS

Frequent emergency department presentations among people who inject drugs: a record linkage study.
Nambiar D, Stoove M, Dietze P.
The International Journal of Drug Policy,
2017 (44): 115-120.
The first study linking data on a cohort of people who inject drugs to a state-wide database of emergency department (ED) presentations. Findings highlighted the need for interventions to prevent ED attendance while recognising healthcare needs of PWID.

Longitudinal changes in personal wellbeing in a cohort of people who inject drugs.
Scott N, Carrotte E, Higgs P, Stoove M, Aitken C, Dietze P.
PLOS One, 2017 (12).
The personal wellbeing of PWID is about 25 per cent lower than that of the general population. Our study showed this measure changed over time among PWID, related to experiences such as assault or unstable accommodation.

Alcohol and other substance use among a sample of young people in Solomon Islands.
Quinn B, Peach E, Wright CJ, Lim MSC, Davidson L, Dietze P.
Australian and New Zealand Journal of Public Health,
2017 (41). 358-364.
Our study addressed crucial data gaps around alcohol and other substance use among young people aged 15 to 24 in Solomon Islands. Findings pointed to prevalent use of substances including betel nut, alcohol and tobacco in this group.

Young Australians' use of pornography and associations with sexual risk behaviours.
Lim MSC, Agius PA, Carrotte ER, Vella AM, Hellard ME.
Australian and New Zealand Journal of Public Health,
2017, 41(4): 438-43.
In the first research paper for over a decade on young Australians' pornography use, we found that four out of five young men watched pornography at least once a week. Pornography use was associated with poorer mental health, younger age, higher education and having anal sex.

The experience of initiating injection drug use and its social context: a qualitative systematic review and thematic synthesis.
Guise A, Horyniak D, Melo J, McNeil R, Werb D.
Addiction, 2017 112(12):2098-2111.
This review synthesised literature surrounding initiation of injection drug use, highlighting that initiation is a dynamic process shaped by social and structural factors. It provides important insights into reducing drug-related harm.

Health Security

PROGRAM GOAL: IMPROVED HEALTH SECURITY IN OUR REGION THROUGH STRENGTHENED PUBLIC HEALTH SYSTEMS AND REDUCED VULNERABILITY TO INFECTIOUS DISEASE THREATS

This program aims to strengthen core public health system capacities required to prepare for and respond to infectious diseases threats in the Asia-Pacific region.

Burnet is working to improve our understanding of infectious disease threats, to develop and apply new laboratory-based, clinical and public health tools to improve health security, and to build the capacity of health professionals, researchers, policymakers and the general community to address health security issues in Australia, our region and globally.

Major components of this program are focused on improving responses to drug-resistant tuberculosis (TB) and strengthening policies and practices to prevent and control both antimicrobial resistance and diseases that can be transmitted from animals to people.

KEY PROJECTS

RID-TB: Reducing the impact of drug-resistant tuberculosis in Western Province, Papua New Guinea (PNG)

The TB epidemic in Western Province is compounded by an outbreak of drug-resistant TB on Daru Island – a public health emergency. The RID-TB project has helped stabilise the epidemic with a model of care to detect, treat and prevent TB, strengthen health systems, train health care workers and promote research.

KICK-AMR: Building capacity in Pacific Island countries to fight antimicrobial resistance (AMR)

Funded by DFAT, this Fellowship brought together 12 AMR leaders from PNG, Fiji, Solomon Islands and Kiribati in Melbourne in October 2017. Burnet and The Alfred Department of Infectious Diseases hosted the program, which established a Pacific AMR network that is sharing ideas and planning activities to help implement newly developed national AMR plans in Pacific Island countries.

Left: Burnet's TB-PALS project offers peer counsellors to support patients through treatment.

Below: Dr Ben Coghlan, Program Director.

"We want to improve understanding of infectious disease threats and apply new tools to improve health security in the Asia Pacific region."

DR BEN COGHLAN, PROGRAM DIRECTOR

Responding to Drug-Resistant Tuberculosis and Malaria in the Asia-Pacific – Tropical Disease Research Regional Collaboration Initiative (TDRRCI)

Menzies School of Health Research and Burnet have joined with institutions in Indonesia, PNG and Malaysia to build regional research capacity. Burnet conducted operational research training for key PNG staff working on TB, and all 12 participants designed research protocols that were approved by PNG's medical research committee. The project established a state-of-the-art data system for TB in Daru, with electronic medical records, geo-spatial mapping and mobile health innovations.

RID-TB: Peer counsellors helping on the TB journey

Burnet is empowering the TB-affected community through a pilot model of patient education and counselling that trains a team of peer counsellors or TB-PALS (People Affected by, Living with, or who have Survived TB). In 2017, this team conducted more than 1,739 individual patient counselling sessions, 343 group/family sessions and made over 450 referrals to relevant service providers to help address side effects, disability, violence or drug and alcohol use.

KEY PUBLICATIONS

Where is the science in humanitarian health?
Waldman RJ, Toole MJ.
Lancet, 2017 Nov, 290 (10109); 2224-2226.
A call to humanitarians working in the health arenas to recognise that the objective of this work is to provide the most effective interventions for the most vulnerable in our societies while paying full respect to their human rights.

Polio's Last Stand.
MJ Toole.
Epidemics, Natural History. 2017 Sep; 125 (8): pp 32-35.
Although the 22 cases of wild poliovirus reported in 2017 represent the lowest number in history, barriers to eradication remain in the form of armed conflict in Afghanistan and Pakistan, the last remaining reservoirs of the virus.

Public-private mix for tuberculosis care and control in Myanmar: a strategy to scale up.
Thet Lwin ZM, Sahu SK, Owiti P, Chinnakali P, Majumdar SS.
Public Health Action, 2017 Mar; 7(1):15-20.
The public-private mix (PPM) TB project was implemented by the Myanmar Medical Association (MMA) in 105 townships in Myanmar. This study supports the continuation and expansion of the MMA-PPM-TB model and/or similar PPM approaches in Myanmar.

The management of infection with *Mycobacterium* tuberculosis in young children post-2015: an opportunity to close the policy-practice gap.
Graham SM.
Expert Review of Respiratory Medicine, 2017 Jan; 11(1):41-49
This review highlights an unprecedented opportunity to close the policy-practice gap in treatment of infection with *Mycobacterium tuberculosis* in young children.

Centers for Disease Control and Prevention Public Health Response to Humanitarian Emergencies 2007–2016.
Boyd AT, Cookson ST, Anderson M, Bilukha OO, Brennan M, Handzel T, Hardy C, Husain F, Lopes Cardozo B, Navarro Colorado C, Shahpar C, Talley L, Toole M, Gerber M.
Emerging Infectious Diseases, 2017 Dec; 23:S196-1202
A review of the CDC Emergency Response and Recovery Branch's contribution to public health emergencies with epidemiologic support for health interventions.

Healthy Ageing

PROGRAM GOAL:
HEALTHY AGEING FROM BIRTH AND IMPROVED PHYSICAL, MENTAL AND SOCIAL WELLBEING IN VULNERABLE COMMUNITIES

As the world's population ages, Burnet's scientists and public health researchers seek to improve physical, mental and social wellbeing for the elderly.

In Australia in 2016, 15 per cent of the population were aged over 65. In 2056 that percentage will rise to 22 per cent, putting a burden on health care services treating age-related diseases such as chronic heart disease, type 2 diabetes and hypertension, a situation reflected globally.

The program focuses on ageing in vulnerable populations, including people living in countries neighbouring Australia, and the LGBTI community.

It contributes to knowledge about biological and psychosocial determinants of healthy ageing, develops new tools and therapeutics, promotes inclusive communities and services for healthy ageing and integrates related concepts into our research and development activities.

The program increases capacity of health professionals, researchers and policymakers in relation to healthy ageing through education and training in Australia and globally.

KEY PROJECTS

Identifying links between inflammation, immune dysfunction and age-related diseases

Conditions such as cardiovascular disease, frailty and cancer are more common in older people, and Burnet scientists are investigating the links between inflammation (which is increased in older individuals) and the function of immune cells known to drive these diseases. We have discovered that inflammation alters the function of immune cells including monocytes, making them more likely to cause atherosclerosis, and have identified a link between altered metabolism in these cells and frailty. These findings resulted in eight scientific publications in 2017.

Addressing the healthcare needs of people ageing with HIV in Victoria

Burnet is collaborating with Living Positive Victoria, the Victorian AIDS Council and Alfred Health to address the healthcare needs of people ageing with HIV.

Left: Dr Anna Hearps, Deputy Program Director and Professor Suzanne Crowe AM, Program Director.

"Healthy ageing is a lifelong process which begins in utero with conditions that predict an individual's risk of later non-communicable disease."

PROFESSOR SUZANNE CROWE AM, PROGRAM DIRECTOR

They are studying current and projected challenges, concerns and needs of this rapidly increasing population, and have obtained human ethics approval and funding from the Australian Government. Results will identify requirements and gaps in the system and influence policy for government.

Developing rapid point-of-care tests to diagnose sepsis

Burnet researchers are investigating novel biomarkers for monitoring and diagnosing sepsis, one of the major causes of death and disability worldwide – particularly in the elderly. We are currently working in collaboration with The Alfred Intensive Care Unit to develop a point-of-care test for rapid and early detection of sepsis. This work was recognised with a Longitude Prize Discovery Award (NESTA, UK) and an inaugural grant from the Victorian Medical Research Acceleration Fund.

KEY PUBLICATIONS

Quantification of monocyte transmigration and foam cell formation from individuals with chronic inflammatory conditions.
Angelovich TA, Hearps AC, Maisa A, Kelesidis T, Jaworowski A.
Journal of Visualized Experiments, 2017. 128:e56293.
Evidence supports the hypothesis that risk of atherosclerosis is increased by chronic inflammatory conditions accompanying diseases such as rheumatoid arthritis and HIV, as well as general ageing, and that this risk is predicted by monocyte (white blood cell) activation. We developed a human *in vitro* model to measure the atherogenic potential of monocytes isolated from individuals with defined disease states.

Major health impact of accelerated aging in young HIV-infected individuals on antiretroviral therapy.
Rajasuriar R, Chong ML, Ahmad Bashah NS, Abdul Aziz SA, Mcstea M, Lee ECY, Wong PL, Azwa I, Syed Omar SF, Lai PSM, Ponampalavanar S, Crowe SM, Lewin SR, Kamaruzzaman SB, Kamarulzaman A.
AIDS, 2017;31(10):1393-1403.
A high burden of geriatric conditions with significant impact on health outcomes, including mortality risk scores, was observed among HIV-infected individuals on antiretroviral therapy in a resource-limited setting.

Immunometabolic and lipidomic markers associated with the frailty index and quality of life in aging HIV+ men on antiretroviral therapy.
Yeoh HL, Cheng AC, Cherry CL, Weir JM, Meikle PJ, Hoy JF, Crowe SM, Palmer CS.
EBioMedicine, 2017 22:112-21.
We assessed the Frailty Index in older HIV-positive Australian men on antiretroviral therapy. Data suggest that frailty is associated with increased innate immune activation and abnormal lipidomic profile.

Differences in emergency ambulance demand between older adults living in residential aged care facilities and those living in the community in Melbourne, Australia.
Cantwell K, Morgans A, Smith K, Livingston M, Dietze P.
Australasian Journal on Ageing, 2017 36(3):212-21.
Older adult ambulance demand has distinct temporal patterns that differ by place of residence and are associated with different clinical presentations. These results provide a basis for informing ambulance planning and the identification of alternate health services.

Where We Work

TARGETING BETTER HEALTH FOR VULNERABLE COMMUNITIES, BURNET'S RESEARCH AND PUBLIC HEALTH ACTIVITIES EXTEND ACROSS AUSTRALIA AND TO OTHER COUNTRIES, WITH A FOCUS ON THE ASIA AND PACIFIC REGIONS.

- Australia
- Cambodia
- China
- Fiji
- India
- Indonesia
- Kenya
- Lao People's Democratic Republic
- Myanmar
- Papua New Guinea
- South Africa
- Thailand
- Timor-Leste
- Vietnam
- Zimbabwe

AUSTRALIA

We work directly with local vulnerable communities across Australia on key health issues affecting them; manage national disease elimination research and health surveillance projects; drive changes in policy and practice at a state and national level; conduct cutting-edge medical research in our Melbourne laboratories; and create effective relationships with community organisations, stakeholders and governments on complex health issues. We work on activities in Victoria, NSW, South Australia, Western Australia, Queensland, ACT and the Northern Territory.

INTERNATIONALLY

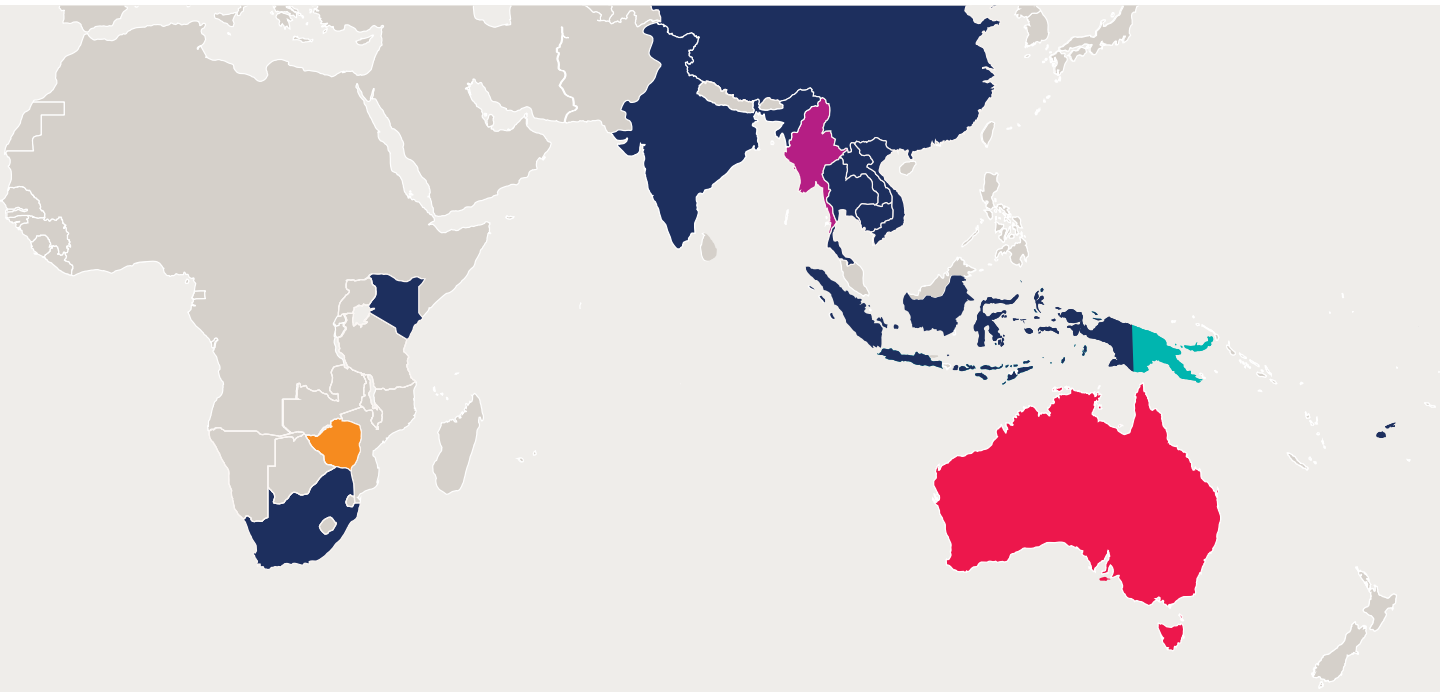
Strategic decisions around our international activities are determined by three imperatives: Burnet's mission to achieve better health for vulnerable communities, public health needs in-country, and our ability to create sustainable partnerships. As an accredited NGO, Burnet can operate internationally in a research and service delivery capacity, and also in a technical support capacity. Myanmar and Papua New Guinea (PNG) form the bedrock of our overseas work, due to longstanding relationships and presence through our established offices. We also work in other countries in the Asia-Pacific Region (notably Lao PDR, China and Zimbabwe), with more than one third of our staff based overseas.

WE VALUE EVIDENCE

Our development projects are based on sound international and local data to inform practice. Through regular project evaluations we build upon the evidence base so that lessons learned can support other health and development programs.

Under the Department of Foreign Affairs and Trade (DFAT) supported Australian Non-Governmental Organisation (NGO) Cooperation Program, Burnet has implemented five projects engaging men as a strategy to address key gendered determinants of health. These projects have been implemented in Myanmar, Papua New Guinea and Zimbabwe. They comprise four maternal and child health projects and one project focused on young men's health.

In recognition of this high concentration of projects engaging men for health and gender equality outcomes, a meta-evaluation was conducted in 2017 to draw out lessons learned in this portfolio of work. These lessons were then shared with DFAT, other Australian NGOs and our in-country partners.



PAPUA NEW GUINEA

For more than 20 years, Burnet has implemented programs with community partners, piloted innovations, and researched health services and systems in PNG. We advocate for improved health policies, train postgraduate health and development specialists, and build health worker capacity.

We employ 46 local staff across three sites – Kokopo (East New Britain Province), Port Moresby, and Daru (Western Province). The PNG program includes work to reduce the impact of drug-resistant tuberculosis (TB), improved point-of-care testing to eliminate congenital syphilis, and the research of our landmark project Healthy Mothers, Healthy Babies.

We highlight gaps in immunisation and postnatal care, and help improve national health research capacity, health system evaluations, communicable disease control planning, and health professional development.

MYANMAR

Burnet has been active in Myanmar since 2003 and employs approximately 100 people in 10 field sites, with our main office in Yangon. Our work includes HIV prevention services, maternal and child health, and adolescent sexual and reproductive health.

In 2017 we provided 89 multidrug-resistant TB patients with treatment adherence support from 40 trained community treatment supporters; gave 4,657 men HIV prevention services, counselling and testing; and provided 56 monastic school teachers (teaching 1,746 students) with in-service training on sexual and reproductive health. Over the next five years we will increase our research portfolio to inform national health policy, planning and financing.

ZIMBABWE

Our rural Zimbabwean project: Mbereko (Women's support groups) and Men: Tackling Barriers to Accessing Maternal, Neonatal and Child Health Services addresses poor maternal and infant outcomes in the first 1,000 days of life.

We are increasing uptake of health services among 1,760 mother-baby pairs at eight rural health clinics in Mutasa District, through village-based women's empowerment groups. These enable women to make positive decisions for family health, and include training in savings and lending schemes.

Men's discussion forums, designed to build partners' capacity to improve family health, have also been in high demand. Early outcomes suggest a strong association between male partner support and maternal mental health. Over 1,050 men have participated and the project has influenced national policy and practice.

Translational Research and Commercialisation

INNOVATIVE NEW PRODUCTS AND SERVICES THAT PREVENT, DIAGNOSE OR TREAT DISEASE CAN IMPROVE HEALTH ON A LARGE SCALE. BURNET IS COMMITTED TO TRANSLATION OF OUR RESEARCH WHERE POSSIBLE TO ACHIEVE OUR GOALS. BURNET'S TRANSLATIONAL ACTIVITIES INCLUDE RESEARCH AND DEVELOPMENT (R&D), TECHNOLOGY LICENSING AND START-UP VENTURES.

Diagnostics: tiny tests, big impact

Notable developments in diagnostics included the success of our spin-off company Nanjing BioPoint Diagnostics in achieving ISO13485 certification (a quality management standard for design and manufacture of medical devices) for its manufacturing facility in Nanjing, China. This enabled the first pilot production of the VL-Plasma device for clinical trials, while the point-of-care ALT1, or liver disease test, moved closer to final manufacture.

Burnet was awarded a highly competitive National Health and Medical Research Council grant to further develop a point-of-care test for the genetic disorder G6PD deficiency. We received grants from both the UK-based Longitude Prize (Discovery Award) and the Victorian Government (Victorian Medical Research and Acceleration Fund) for our work towards a point-of-care test for sepsis. In late 2017, Omega Diagnostics UK and Burnet announced CE-Marking (European Union certification) of Omega's VISITECT® CD4 point-of-care HIV test, following successful performance evaluations in India and the UK.

Above: (Foreground): Professor Gilda Tachedjian. (L-R): Researchers Dr Sushama Telwatte, Dr Josh Hayward and David Tyssen.

Post-biotic for reducing vaginal inflammation

Cervicovaginal inflammation is increasingly being acknowledged as a major risk factor for sexually transmitted infections in women. Women suffering bacterial vaginosis (BV) have a two-fold increased risk of acquiring HIV. BV is caused by an imbalance of normal vaginal microbiota in which healthy bacteria, consisting mainly of *Lactobacillus* species, is overcome by a mix of harmful bacteria.

Professor Gilda Tachedjian and her team continue to progress their work on developing a novel technology with the potential of promoting vaginal health by reducing cervicovaginal inflammation, and won a grant from the Australian Centre for HIV and Hepatitis Virology Research to support this work. The team discovered that lactic acid, a metabolite or 'post-biotic' produced by protective vaginal lactobacilli, has anti-inflammatory effects on cervicovaginal epithelial cells in vitro. In 2018 Professor Tachedjian will work towards formulating and trialling lactic acid-containing topical products in humans, to determine whether they assist in decreasing genital inflammation and harmful bacteria.

The VL Plasma device – driven by policy change

Changes in health policy and can create demand for new solutions and products. For example, the welcome expansion of access to antiviral drugs for treatment of HIV infection globally, a result of World Health Organization recommendations, has created a demand for regular patient testing to ensure these drugs are working to suppress viral load (VL). VL testing is routinely performed at centralised laboratories with sophisticated equipment, but in resource-poor countries it is extremely difficult to transport samples to these labs.

To simplify VL testing, Burnet has developed a device to separate and dry plasma at the point-of-care in collaboration with Melbourne-based firm Axxin Ltd. This has subsequently been licensed to Nanjing BioPoint Diagnostics in China, where it is now being manufactured as the VL-Plasma device.

The device is currently undergoing clinical trial at the University of Malaya, which will support its future product registration for sale worldwide, allowing HIV patients everywhere to get accurate VL testing to ensure that their treatment is working.

Below: Burnet student Berhan Haile with the VL Plasma device. Dr Haile developed the test's strip as the centrepiece of his PhD.

360biolabs, a partnership between Burnet and Innoviron, is a contract research organisation providing specialist laboratory services for the development of new therapeutics, vaccines and diagnostics in a quality-assured environment.

Formed in late 2015, 360biolabs has already established itself as a high-quality specialist service provider to more than 50 Australian and international clients, adding value to the growing clinical trials industry in Australia. In its two years of operation it has exceeded growth projections and recorded a turnover in excess of AUD$4 million in 2017.

Optima Consortium for Decision Science (OCDS)

Burnet is a partner of OCDS, which has created a suite of global public good tools (Optima) and applied them to inform better decision and delivery choices by national decision-makers, program managers and funding partners. Led by Burnet's Head of Infectious Disease Modelling Professor David Wilson, over 50 countries have utilised Optima to inform their national HIV strategies. Optima is also used to support the World Bank and US President's Emergency Plan for AIDS Relief (PEPFAR) with in-country HIV allocative efficiency analyses.

In 2017 significant work was undertaken to expand applicability of the Optima approach to help address other global health challenges, including tuberculosis in Belarus, South Africa, Peru and Papua New Guinea; malaria in Nigeria; hepatitis in Australia and globally; and malnutrition in Bangladesh and Tanzania.

Below: The Nanjing BioPoint team achieved ISO13485 certification for its manufacturing facility in Nanjing, China.

Education and Training

AS A MEMBER OF THE ALFRED MEDICAL RESEARCH AND EDUCATION PRECINCT (AMREP), BURNET INSTITUTE PROVIDES OPPORTUNITIES FOR TALENTED UNDERGRADUATE AND POSTGRADUATE STUDENTS. WE OFFER STRONG MENTORSHIP WITH LEADING SCIENTISTS, RESEARCH PROJECTS WITH A HIGH TRANSLATIONAL CAPACITY, AND WORLD-CLASS FACILITIES.

Research Projects

Ninety students participated in biomedical laboratory-based projects, epidemiology and field-based research. Supervisors and their research teams successfully trained and mentored 20 Honours students enrolled across four universities:

- Monash University 12
- University of Melbourne 6
- La Trobe University 1
- University of New England 1

Fifteen Masters students who trained at Burnet were enrolled through national and international universities:

- University of Melbourne 9
- Monash University 2
- University of Sydney 1
- Leipzig University (Germany) 1
- Utrecht University (The Netherlands) 1
- Lund University (Sweden) 1

Burnet's PhD program continues to grow in size and reputation, with 55 students enrolled across eight universities:

- Monash University 31
- University of Melbourne 17
- RMIT University 1
- Swinburne University 1
- University of New South Wales 1
- Deakin University 2
- Federation University 1
- Ghent University (Belgium) 1

Students and supervisors are supported by Burnet's Research Student Committee, which includes senior scientists. Fifty of our 247 peer-reviewed scientific publications this year involved at least one student author.

Several students received travel awards to attend national and international conferences, awards for posters or oral presentations, overseas postdoctoral training and academic appointments. Burnet thanks the Chair of Education, Dr Raffi Gugasyan, for his contribution in 2017.

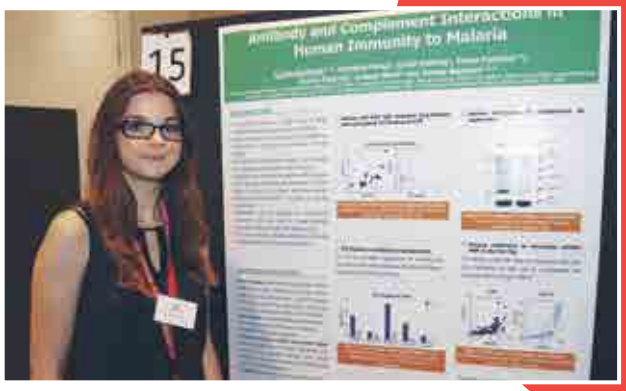
Postgraduate international public health studies

Burnet coordinated and delivered 10 accredited postgraduate international public health units for Monash University's Master of Public Health and Master of International Health. These courses encompassed Burnet's global health expertise including women's and children's health, infectious diseases, nutrition, alcohol and other drugs, refugee health, health economics and primary health care. They attracted domestic and international postgraduate students as well as short-course participants, with 171 enrolments in 2017.

PhD students

Burnet's PhD program continues to flourish. Our most recent PhD students researched HIV entry and replication, immunology and inflammation, malaria, tuberculosis, drug misuse, and sexual health in Papua New Guinea.

Above: Chair of Education Dr Raffi Gugasyan speaks to Burnet PhD student Jasper Cornish. In 2017, 90 postgraduate students carried out research at Burnet.



"During my PhD, Burnet has facilitated strong international ties with leading researchers so that collaboratively, we can unravel the immune response to malaria and aid vaccine development."

– PhD CANDIDATE, LIRIYE KURTOVIC

Congratulations to all students awarded their PhDs for the following theses:

Kerryn Moore
The influence of the gestational age at malaria detection and treatment during pregnancy on adverse outcomes in an area of low endemicity.

Jessica Anania
FcγRIIc: Characterisation of novel Fc receptor interactions and a new receptor form.

Vashti Irani
Dissecting human IgG subclass responses in natural and vaccine acquired immunity to malaria.

Dr Minh Duc Pham
Improving coverage of, and access to, HIV-related testing in low- and middle-income countries: Barriers, facilitators and implications for HIV research and public health interventions.

Annemarie Laumaea
Evolution and complexity of conformational signalling during co-receptor switching in R5X4 virus and implications for R5X4 tropism.

Hannah King
Strategies for the elicitation of broadly neutralising antibodies to the HIV-1 envelope protein.

Vani Geetha Samanthi Narasimhulu
Studies on the role of the membrane proximal ectodomain region (MPER) of HIV-1 gp41 in virus transmission and viral glycoprotein antigenic structure.

Berhan Ayele Haile
Enhancing access and utility of assays for ART initiation and monitoring of HIV patients in resource-limited settings.

Xi Zen Yap
Characterisation of dendritic cell responses to blood-stage *Plasmodium falciparum*.

Genelyn Dimasuay
Placental mTOR signalling and fetal growth restriction in placental malaria.

Sherrie Kelly
More bang for buck in global HIV resource allocation.

Cassandra Wright
A mobile phone intervention for reducing alcohol consumption delivered during drinking events: development, testing and translation.

Dhanya Nambiar Dinesh Kumar
Health service utilisation among people who inject drugs: the effects of demographics, substance use and health services.

EDUCATION IN NUMBERS

90 students

55 PhD students

15 Masters students

20 Honours students

10 accredited postgraduate international public health units

171 enrolments in public health courses

247 peer-reviewed publications in 2017

Thanks to our Supporters

THE ADVANCES WE MAKE IN MEDICAL RESEARCH, AND THROUGH OUR PUBLIC HEALTH AND INTERNATIONAL PROGRAMS, ARE ONLY POSSIBLE THROUGH THE GENEROUS PHILANTHROPIC SUPPORT OF THE COMMUNITY, TRUSTS AND FOUNDATIONS, AND THE CORPORATE SECTOR. THANK YOU TO ALL THOSE WHO SUPPORTED THE INSTITUTE DURING THE YEAR.

DEVELOPMENT OF RAPID DIAGNOSTIC TESTS

The ability to quickly diagnose sepsis (an overwhelming infection in the blood) through the development of a rapid point-of-care test was given a significant boost with substantial philanthropic support from the community and a grant from the Victorian Government's Medical Research Acceleration Fund. Burnet Deputy Director Associate Professor David Anderson (pictured left) said the new test would require just a finger-prick of blood to identify patients with early-stage infection, preventing thousands of deaths around the world. Sepsis is a leading cause of death and hospitalisation.

We thank everyone who supported our appeals throughout the year or made a direct donation to the Institute. Every dollar counts. Your generosity does make a difference.

HEALTHY MOTHERS, HEALTHY BABIES

Thanks to community and corporate support, Burnet's flagship program Healthy Mothers, Healthy Babies met a huge milestone during the year with the recruitment of 700 pregnant women into the study. All women and their babies have now been followed up at the one-month stage and all will have had their 12-month follow-up by the end of 2018. Analysis of early data is revealing high levels of anaemia among mothers and their babies as well as high levels of infectious diseases. Once all data is analysed, we will identify key interventions to improve health and wellbeing of mothers and their babies in Papua New Guinea (PNG). We extend our appreciation and thanks to Principal Supporter Bank South Pacific, and to Lamana Group, Tropicana, June Canavan Foundation, Arnold Bloch Liebler, Exxon Mobil, Sing Wo Brothers, SP Brewery and the many individuals who support this program.

HEALTHY AGEING

Burnet's research into healthy ageing covers a range of areas including older people living with HIV, non-communicable diseases such as cancer and rheumatoid arthritis, and the relationship between inflammation and other diseases. HIV has been a significant area of research at Burnet since the Institute's early days and as many people living with HIV in Australia grow older, the need to understand the metabolic factors behind HIV progression is critical. Dr Clovis Palmer (pictured above) carried out HIV research which was a key beneficiary of community support during the year, and we thank the many people who contributed to his important work.

PHILANTHROPIC SUPPORT MAKES A DIFFERENCE

Bequests (or gifts in wills) are a great way to directly support the Institute's vision of equity through better health. They enable us to use the money where it's most needed at the time it's received. The Healthy Mothers, Healthy Babies project underway in PNG would not have been possible without direct and continued philanthropic support from our generous donors.

"I am very impressed with Burnet's work over many years. I want the Institute to prosper for as long as possible into the future. That is why I have left a gift in my Will to Burnet Institute."

– MERLE GILBO OAM

2017 Awards

THE FENNER AWARD

Dr Chris Morgan

Dr Morgan was awarded the Institute's prestigious Fenner Award for 2017, recognising his outstanding contribution to international public health. The award is named in honour of Australian virologist the late Professor Frank Fenner AC, and presented to a Burnet Institute staff member whose work has made a major contribution towards our mission of achieving better health for vulnerable communities in Australia and internationally. Dr Morgan is a Principal Investigator of Burnet's Healthy Mothers, Healthy Babies collaborative research project in Papua New Guinea, and Head of International Development.

GUST-MCKENZIE MEDAL

Dr Joseph Doyle

Dr Doyle was recognised for his research into the epidemiology, management and prevention of blood-borne virus infections with the Gust-McKenzie Medal for 2017. The medal is awarded to a mid-career Burnet Institute staff member for excellence in research and/or public health. Dr Doyle is Deputy Program Director of Disease Elimination and Co-head of Viral Hepatitis Research.

TRAVEL AWARDS

Seven talented researchers received Travel Awards to enable them to attend conferences or undertake further study:

HAROLD MITCHELL FOUNDATION POSTDOCTORAL TRAVEL FELLOWSHIP
Dr Herbert Opi
Beeson and Richards Laboratories, Maternal and Child Health, Disease Elimination

THE PAULINE SPEEDY BIOMEDICAL RESEARCH TRAVEL FELLOWSHIP
Katherine O'Flaherty
Fowkes Laboratory, Disease Elimination, Maternal and Child Health

HAROLD MITCHELL FOUNDATION POSTGRADUATE TRAVEL FELLOWSHIP
Kathleen Ryan
HIV Prevention, Behaviours and Health Risks, Disease Elimination

THE HON GEOFFREY CONNARD TRAVEL FELLOWSHIP
Jacqui Richmond
Behaviours and Health Risks, Disease Elimination

MILLER FOUNDATION BIOMEDICAL RESEARCH TRAVEL AWARD
Riya Palchaudhuri
Crowe and Anderson Laboratories, Disease Elimination, Healthy Ageing

MILLER FOUNDATION PUBLIC HEALTH TRAVEL AWARD
Cassandra Wright
Behaviours and Health Risks, Disease Elimination

THE CROCKETT-MURPHY TRAVEL AWARD
Primrose Homiehombo
Healthy Mothers, Healthy Babies project, East New Britain, Papua New Guinea

Burnet Institute's **Global Health Diagnostics Laboratory** was awarded a prestigious Longitude Prize Discovery Award to facilitate development of a laboratory-based sepsis assay into a point-of-care test.

Burnet Institute Non-Executive Director **Professor Peter Colman** was awarded a Companion of the Order of Australia (AC) as part of the Queen's Birthday Honours list.

Burnet Senior Fellow **Dr Peter Higgs** (bottom left) and Eliminate Hep C Partnership Education and Training coordinator **Jacqui Richmond** (bottom right) shared Hepatitis Victoria's individual contribution award. Pictured here with infectious diseases physician and award nominee Dr Kudzai Kanhutu.

Financial Summary

IN 2017, THE INSTITUTE SPENT APPROXIMATELY AUD$46 MILLION ON IMPROVING HEALTH FOR VULNERABLE COMMUNITIES IN AUSTRALIA AND INTERNATIONALLY.

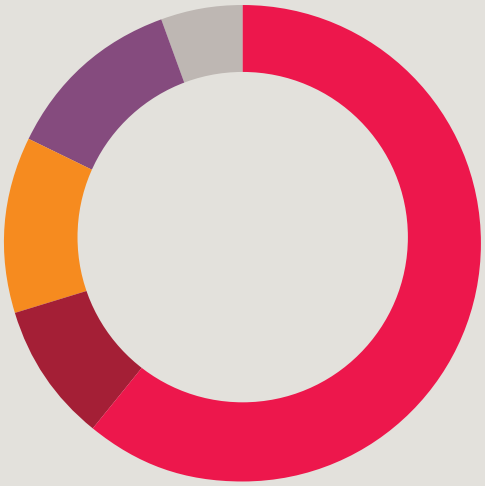
The Statements of Financial Position and Comprehensive Income provided in this section were extracted from the audited general purpose financial statements of the consolidated operations of Burnet Institute. The summary financial information does not include all the information and notes normally included in a statutory financial report.

The statutory financial report (from which the summary financial information has been extracted) was prepared in accordance with Australian Accounting Standards (AASBs) adopted by the Australian Accounting Standards Board (AASB) and the Australian Council for International Development Code of Conduct and the Australian Charities and Not-for-Profit Commission Regulations.

The Group recorded a deficit in the current year of AUD$2,278,399 (2016: deficit AUD$1,013,131). Depreciation and amortisation amounted to AUD$2,585,971 (2016: AUD$2,517,272). Income tax is not applicable. The 2017 consolidated result includes a deficit of AUD$671,704 (2016: AUD$710,053 deficit) from the BioPoint subsidiary companies.

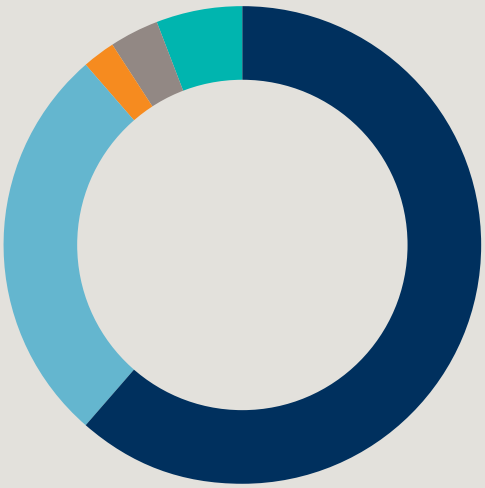
For a full copy of the 2017 audited general purpose financial report please contact Burnet Institute on +61 3 9282 2111, email info@burnet.edu.au or visit www.burnet.edu.au.

INCOME 2017



- Competitive Grants / Contracts (AUD$26.7m)
- Operational Infrastructure (AUD$4.1m)
- Fundraising (AUD$5.2m)
- Investments (AUD$5.3m)
- Other (AUD$2.4m)

EXPENDITURE 2017



- Research / Public Health (AUD$28.3m)
- Facilities & Admin (AUD$12.5m)
- Fundraising (AUD$1.1m)
- Business Development (AUD$1.5m)
- Amortisation / Depreciation (AUD$2.6m)

Consolidated Statement of Comprehensive Income

(FOR THE YEAR ENDED 31 DECEMBER)

	Notes	2017 $'000	2016 $'000
Operating revenue	3	38,391	35,769
Other income	3	4,553	4,417
Research and development laboratory consumables expenses		(5,087)	(3,351)
Personnel expenses	4	(21,358)	(21,480)
Depreciation and amortisation expenses		(1,301)	(1,232)
Depreciation and amortisation expenses – property management		(1,285)	(1,285)
Research and development non-laboratory expenses		(8,673)	(8,256)
Other expenses from ordinary activities	5	(6,060)	(6,133)
Results from operating activities		(820)	(1,551)
Financial income	7	157	306
Financial expenses	7	(1,064)	(1,145)
Net finance costs		(907)	(839)
Gain on adoption of equity accounting		–	1,385
Share of loss in associate		(551)	(8)
Net results of equity accounting		(551)	1,377
Deficit Before Income Tax		(2,278)	(1,013)
Income tax expense		–	–
Deficit After Income Tax		(2,278)	(1,013)
Deficit After Income Tax Attributable to:			
Members of the Company		(2,264)	(862)
Non-controlling interests		(14)	(151)
Deficit After Income Tax		(2,278)	(1,013)
Other comprehensive income			
Foreign currency translation differences – foreign operations		(17)	(67)
Total Comprehensive Deficit for the Period		(2,295)	(1,080)
Total Comprehensive Deficit Attributable to:			
Members of the Company		(2,277)	(915)
Non-controlling interests		(18)	(165)
Total Comprehensive Deficit for the Period		(2,295)	(1,080)

The Consolidated Statement of Comprehensive Income is to be read in conjunction with the Notes to the Consolidated Financial Statements.

Consolidated Statement of Financial Position

(AS AT 31 DECEMBER)

	Notes	2017 $'000	2016 $'000
Current Assets			
Cash and cash equivalents		12,329	13,908
Trade and other receivables	8	4,830	3,791
Investments	9	–	2,100
Inventories		38	30
Other Assets - prepayments		370	442
Total Current Assets		**17,567**	**20,271**
Non-Current Assets			
Lease receivables		1,996	1,732
Investments	9	2,803	3,400
Property, plant and equipment	10	59,560	61,117
Total Non-Current Assets		**64,359**	**66,249**
Total Assets		81,926	86,520
Current Liabilities			
Trade and other payables		2,992	2,731
Borrowings	11	887	703
Current tax liabilities - FBT		35	52
Provisions	12	2,968	2,793
Deferred income	13	12,028	13,039
Total Current Liabilities		**18,910**	**19,318**
Non-Current Liabilities			
Borrowings	11	32,932	33,319
Provisions	12	1,371	1,434
Deferred income	13	7,519	8,347
Derivatives	14	1,867	2,480
Total Non-Current Liabilities		**43,689**	**45,580**
Total Liabilities		**62,599**	**64,898**
Net Assets		**19,327**	**21,622**
Equity			
Retained deficit		(5,801)	(1,624)
Building reserve		24,917	23,004
Foreign Currency Translation Reserve		141	158
Non-controlling interests		70	84
Total Equity		**19,327**	**21,622**

The Consolidated Statement of Financial Position is to be read in conjunction with the Notes to the Consolidated Financial Statements.

The Macfarlane Burnet Institute for Medical Research and Public Health Limited is a signatory to the Australian Council for International Development (ACFID) Code of Conduct. The Code requires members to meet high standards of corporate governance, public accountability and financial management. In accordance with the ACFID code of conduct, the Institute had nil balances in the following categories as at the end of the financial year which are required to be disclosed separately:

- Current Assets: assets held for sale, and other financial assets;
- Non-Current Assets: trade and other receivables, other financial assets, investment property, intangibles, and other non-current assets;
- Current Liabilities: other financial liabilities and other current liabilities;
- Non-Current Liabilities: trade and other payables, other financial liabilities and other non-current liabilities.

Burnet Institute International Development Activities Operating Statement

(FOR THE YEAR ENDED 31 DECEMBER)

	2017 $'000	2016 $'000
Revenue		
Donations and gifts – monetary	679	–
Donations and gifts – non-monetary	–	–
Bequests and legacies	–	–
Grants:		
• DFAT	5,386	4,730
• Other Australian	1,305	1,455
• Other Overseas	2,587	3,495
Investment Income	–	–
Commercial Activities Income	–	–
Other Income	1,230	1,579
Revenue for international political or religious proselytisation programs	–	–
Total revenue	11,187	11,259
Expenditure		
International aid and development programs expenditure		
International programs:		
• Funds to international programs	10,515	11,092
• Program support costs	1,103	870
Community education	–	–
Fundraising costs:		
• Public	–	–
• Government, multilaterals and private	–	–
Accountability and administration	249	388
Non-monetary expenditure	–	–
Total international aid and development programs expenditure	11,867	12,350
Expenditure for international political or religious proselytisation programs	–	–
Domestic programs expenditure	164	253
Commercial Activities Expenditure	–	–
Other Expenditure	–	–
Total expenditure	12,031	12,603
(Shortfall)/Excess of revenue over expenditure	(844)	(1,344)
Other Comprehensive Income	–	–
Total Comprehensive Income	**(844)**	**(1,344)**

Notes:
This operating statement represents IFRS financial information and is extracted specifically for the operations of the International Health Programs as required by the ACFID Code of Conduct. The deficit represents the Burnet Institute's additional financial contribution to the program.

www.acfid.asn.au Tel: (02) 6285 1816 Fax: (02) 6285 1720

The Macfarlane Burnet Institute for Medical Research and Public Health Limited is a signatory to the Australian Council for International Development Code of Conduct. The Code requires members to meet high standards of corporate governance, public accountability and financial management. These financial statements have been prepared in accordance with the requirements set out in the ACFID code of conduct. More information about the ACFID Code of Conduct can be obtained from ACFID.

KPMG

Report of the independent auditor on the summary financial statements to the members of Macfarlane Burnet Institute for Medical Research and Public Health Ltd

The accompanying summary financial statements, which comprises the summary consolidated statement of financial position as at 31 December 2017, the summary consolidated statement of comprehensive income, and the International Development Activities Operating Statement, are derived from the audited financial report of Macfarlane Burnet Institute for Medical Research and Public Health Ltd for the year ended 31 December 2017. We expressed an unmodified auditor's opinion on that financial report in our report dated 17 April 2018.

The summary financial statements do not contain all the disclosures required by Australian Accounting Standards. Reading the summary financial statements, therefore, is not a substitute for reading the audited financial report of Macfarlane Burnet Institute for Medical Research and Public Health Ltd.

Directors' responsibility for the summary financial statements

The directors are responsible for the preparation of a summary of the audited financial report on the basis described in Note 1.1.

Auditor's responsibility

Our responsibility is to express an opinion on the summary financial statements derived from the audited financial report of Macfarlane Burnet Institute for Medical Research and Public Health Ltd based on our procedures, which were conducted in accordance with Auditing Standard ASA 810 *Engagements to Report on Summary Financial Statements*.

Auditor's opinion

In our opinion, the summary financial statements derived from the audited financial report of Macfarlane Burnet Institute for Medical Research and Public Health Ltd for the year ended 31 December 2017 are consistent, in all material respects, with that audited financial report, on the basis described in Note 1.1.

KPMG

KPMG

Simon Dubois
Partner
Melbourne
17 April 2018

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OVERSEAS OFFICES

Burnet has offices or representatives in Myanmar, Papua New Guinea, China, Lao PDR and Zimbabwe.

For more information contact us at info@burnet.edu.au or call + 61 3 9282 2111.

Medical Research. Practical Action.

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