EX-PRISONERS ARE DYING AT A RATE TEN TIMES THAT OF THOSE IN CUSTODY

NEW RESEARCH BY DR STUART KINNER

FUNDING BOOST TO HELP FIND A CURE FOR HIV

HOW EFFECTIVE IS AUSTRALIA’S AID PROGRAM?
Welcome to the summer edition of IMPACT. In this issue Dr Stuart Kinner, Head of the Burnet Institute’s Justice Health program looks at a range of public health concerns which relate to prisoner health. Almost two per cent of Australians have spent some time in prison and it is estimated around 50,000 people are released back into the community each year. A range of chronic, complex and often preventable health and social issues have been well documented among prisoners and those released back into the community. Many have a history of injecting drug use and alcohol abuse, and a high percentage are infected with the hepatitis C virus. Associated with these issues come a number of broad public health and economic problems. To address these, we need more research which will help to design and deliver better strategies to improve the health and welfare of prisoners and those released back into the community.

Earlier this year, the Federal Government released a long-awaited independent review on the effectiveness of Australian overseas aid. The review and the Government’s response to the review are profoundly important documents that will long guide Australia’s growing foreign aid program. It was incredibly encouraging that the primary focus of the program will remain the alleviation of poverty and that health and research are priorities. The Burnet Institute is an accredited non-government organisation and a major recipient of funding from the Australian Agency for International Development (AusAID). Deputy Director and Head of our Centre for International Health, Professor Mike Toole looks at the Aid Effectiveness Review and how it might impact on the Institute and our capacity to develop and grow our international health programs.

The past year has been an important one for the Institute. We celebrated our 25th anniversary year, and while we took time to reflect on our achievements, we also reviewed our mission statement and our strategic plan for the next five years. While our key focus remains on achieving better health for poor and vulnerable communities in Australia and overseas, we will continue to build on the successes of the past and also look at the best ways of further developing our research and public health programs. Of course, as with past successes, our ability to continue to contribute to improving health outcomes for the community is directly related to the support provided by our wonderful donors. While we celebrated our achievements over the past 12 months, we also acknowledged the philanthropic support provided by many private and corporate friends of the Institute at the inaugural Burnet Institute Excellence Awards. We have profiled some of the highlights in this issue of IMPACT.

As this is the final IMPACT for 2011, I would like to take this opportunity of thanking you again for your support. I know all the staff at the Institute would join with me in wishing you a happy and safe festive season and we look forward to sharing more about the Institute and our work with you in 2012.

Professor Brendan Crabb, Director and CEO
Long way to go in HIV fight: Professor Françoise Barré-Sinoussi

Professor Barré-Sinoussi reflects, “30 years on and AIDS mortality and HIV incidence is still high, so there is an urgent need for therapeutic and vaccine strategies.”

A capacity crowd filled BMW Edge in Melbourne to hear Nobel Laureate Professor Françoise Barré-Sinoussi present the 2011 Burnet Oration. Professor Barré-Sinoussi was awarded the 2008 Nobel Prize for Medicine for her discovery (together with Professor Luc Montagnier) of the virus we now know as HIV.

Nobel Laureate, Professor Peter Doherty, AC gave insight into the woman who was at the frontline of HIV research in the early ’80s. Special guests included former Directors of Burnet Professor Ian Gust, AO and Professor John Mills and current Board members.

Professor Barré-Sinoussi reflected on the fight against HIV and AIDS, 30 years on, and while she highlighted the significant scientific achievements, her clear message was that “there is still a long way to go.”

“We still have a few challenges; treatment has been a big benefit in reducing mortality by more than 85 per cent and there is strong evidence that treatment equals prevention,” she said.

“But the challenge is sustainability of life-long treatment; it’s very expensive in the developing world, plus there are side effects and complications like ageing diseases. We need to work on a vaccine.”

International funding levels remain a key concern. Professor Barré-Sinoussi said the Global Fund budget for HIV, tuberculosis and malaria is only half what it should be.

“It will be a catastrophe everywhere (if funding isn’t secured), particularly in developing countries where we are seeing progress. We are worried about the consequences of stopping treatment of antiretroviral therapy in patients,” she added.

Professor Barré-Sinoussi’s overall message was that the fight against HIV and AIDS is far from over, and that scientists needed to join with world leaders, business and communities to continue the global effort.

Burnet celebrates 25th anniversary at Parliament House

Ms Stott Despoja, AM said the Institute was one of the great medical research and public health organisations in Australia.

Burnet’s 25th anniversary celebrations continued with a special cocktail function at Parliament House in Canberra on 22 August.

Politicians and representatives from AusAID, the National Health and Medical Research Council (NHMRC) and the Global Fund joined Burnet Board members Natasha Stott Despoja, AM and Professor, the Hon Barry Jones, AO to celebrate the Institute’s contribution to global health.

Burnet’s Director and CEO Professor Brendan Crabb said the event was a wonderful opportunity to highlight the Institute’s achievements over the past 25 years.

“Since 1986, the Institute has been working with a single mission, to achieve better health for poor and vulnerable communities in Australia and internationally through research, education and public health,” and we’re extremely proud of our successes,” Professor Crabb said.

Mid-Year Appeal Thank You

We would like to thank everyone who supported our Mid-Year Appeal. As a direct result of your support, we have been able to upgrade the fluorescent microscopes housed in our Cell Imaging Facility and purchase a new high-performance centrifuge for our Malaria Research Group. The equipment purchased will accelerate the research already being done by Dr Candida da Fonseca Pereira, Dr Paul Sanders and others in the search for vaccines and new treatments for HIV and malaria.

Dr Candida da Fonseca Pereira, head of Burnet’s Cell Imaging Facility.

OUR CHRISTMAS APPEAL: With your support we will train local health workers in birth-dose vaccination, postnatal care and recognising danger signs associated with birth in countries such as Laos, Burma and Papua New Guinea. For information on how you can support our appeal visit burnet.edu.au or see the support coupon inserted in this magazine.

IMPACT Summer 2011 3
New research by Dr Stuart Kinner, Head of Justice Health Research from Burnet’s Centre for Population Health has revealed that ex-prisoners are dying at a rate ten times that of those in custody.

“These estimates suggest that at least one recently-released prisoner dies each day in Australia. The large number of deaths among ex-prisoners, particularly during the first few weeks after release from custody, highlights the extreme vulnerability of these men and women once they return to the community,” Dr Kinner said. The study highlights an urgent need to establish a national system for routine monitoring of ex-prisoner mortality, and to implement evidence-based programs to reduce preventable deaths in this profoundly marginalised population.
OUR PRISON POPULATION

Australia’s prisoner population is growing at a rate well in excess of natural population growth. There were 29,700 adults in full-time custody at 30 June 2010, representing a 15 per cent increase in incarceration rate from 2000-2010. Women comprise eight per cent of adult prisoners but this proportion is increasing annually. Indigenous Australians are over-represented in adult prisons by a factor of 14, and the gap between Indigenous and non-Indigenous incarceration rates continues to widen.

“The chronic, complex and often preventable health, social and economic marginalisation of prisoners in Australia has been well documented. More than a third of Australian prisoners have hepatitis C on entry to prison, with even higher rates reported at release, and over a 12 month period the prevalence of mental illness is 80 per cent,” Dr Kinner said.

“The majority of prisoners have a history of injecting drug use, and risky use of alcohol, tobacco and other drugs is endemic.”

During 2009/10 direct expenditure on corrective services in Australia was $2.8 billion, with the vast majority of these funds committed to containment rather than healthcare or rehabilitation. Evidence from the Productivity Commission reveals that existing rehabilitation efforts are having limited success: among those released from custody in Australia in the 2007/08 financial year, 38 per cent were back in prison within two years.

Little is known about what happens to people once they are released from prison, and remarkably, the number of persons released from custody each year in Australia is not known. However, given the large number of prisoners serving short sentences, this number is likely to exceed 50,000 per annum. Australia’s ex-prisoner population has been estimated at more than 385,000, representing around 1.8 per cent of Australia’s total population.

UNDERSTANDING THE RISKS

Prisoners often have poor health and most return to the community after a relatively short period of time in custody, so it is a truism that ‘prisoner health is public health’.

Yet despite the touted policy of ‘throughcare’ for Australian prisoners, it is typically health impairment, rather than health service delivery, that continues from community to prison and back to community. For example, a recent study in Western Australia found that a fifth of prisoners were hospitalised within one year of release from custody, with 37 per cent of associated bed days due to unresolved mental health problems.

The increased risk of death among those released from prison is also alarming, with studies in Australia and elsewhere revealing that the risk of death in ex-prisoners remains higher than that of their age- and sex-matched peers for more than a decade after release. The risk of death is greatest in the weeks immediately following release, with a recent analysis finding that the risk of drug-related death was between three and eight times higher in the first two weeks after release from prison than in the following 10 weeks.

Despite this, there is currently no mechanism in Australia to routinely monitor the incidence of mortality among ex-prisoners. This makes it difficult to gauge the impact of changes in correctional policy or other risk factors on mortality, leaving policy-makers without the necessary tools to make evidence-based decisions. Although health service planning for prisoners in Australia will benefit from the recently established national minimum dataset (NMDS) for prisoner health, the same cannot be said for the much larger population of ex-prisoners, who are currently excluded from this collection.

“The most robust and efficient method of monitoring mortality outcomes for ex-prisoners is through routine record linkage, but this is not currently feasible at a national level,” Dr Kinner said.

However, using data from two State-based record linkage studies (NSW and WA), and an estimate of the number and characteristics of prison releases nationally over a one-year period, Dr Kinner and his team were able to estimate the number of deaths among adults released from Australian prisons in 2007/08. They specifically investigated the number of deaths within the first four weeks of release, and also within 12 months of release, and characterised those deceased in terms of age, gender, Indigenous status and cause of death.

FINDINGS

The estimated total number of deaths nationally based on data from the NSW and WA cohorts was similar, as were most estimates within demographic subgroups. One exception was deaths among Indigenous ex-prisoners, with the NSW-based estimate 45 per cent greater than the WA-based estimate, possibly reflecting different patterns of substance use among Indigenous ex-prisoners in these two states.

“Based on data from the WA cohort, we estimated that 138 people released from prison in Australia during 2007/08 died within 28 days of release, with the majority being non-Indigenous, male and over 40 years old,” Dr Kinner said.

DURING 2009/10 DIRECT EXPENDITURE ON CORRECTIVE SERVICES IN AUSTRALIA WAS $2.8BILLION, WITH THE VAST MAJORITY OF THESE FUNDS COMMITTED TO CONTAINMENT RATHER THAN HEALTHCARE OR REHABILITATION.
“THE VAST MAJORITY OF DEATHS WERE PREVENTABLE, WITH BETWEEN 31% & 45% DUE TO DRUG-RELATED CAUSES.”

“The NSW-based estimate was more conservative, with 68 ex-prisoners estimated to have died within 28 days of release, the majority again being non-Indigenous and male, but younger than 40 years of age. The overall rate of death among ex-prisoners within one month of release in WA was more than twice that observed in NSW”.

In both jurisdictions, fewer than half of all deaths within one year of release from prison were drug-related, although the proportion of drug-related deaths was higher among the NSW cohort in both the first year and the first 28 days post-release. Conversely, the proportion of deaths due to natural causes was higher among the WA cohort.

In both studies, a disproportionate number of deaths occurred in the first month after release.

WHERE TO FROM HERE?
A large proportion of the deaths in both cohorts was drug-related, highlighting the on-going need to develop and implement evidence-based strategies to reduce drug-related deaths among ex-prisoners.

One such strategy is opiate substitution therapy (OST), which has been associated with reduced mortality, re-incarceration and hepatitis C infection in ex-prisoners. Yet, despite unambiguous endorsement of OST in the National Corrections Drug Strategy 2006-2009, provision of OST in Australian prisons remains inconsistent. Another suggested approach is providing naloxone – a drug used widely by paramedics to reverse the effects of a heroin overdose – for friends or family to administer in the event of an overdose. A clinical trial of naloxone provided to those at risk of overdose on release from prison has been proposed but not yet conducted.

Although drug overdose is a leading cause of death for recently released prisoners, more than half the deaths in Dr Kinner’s study were not drug-related, and at least two-thirds of deaths in the first year occurred more than one month post-release. These findings underscore the importance of moving beyond simplistic messages about reduced drug tolerance and overdose risk in the first few weeks post-release. Instead, Dr Kinner suggests building a more sophisticated, evidence-based approach to reducing mortality among ex-prisoners from multiple preventable causes over at least the first year post-release. To be effective, preventive interventions must be multi-
“THE MAJORITY OF PRISONERS HAVE A HISTORY OF INJECTING DRUG USE, AND THE RISKY USE OF ALCOHOL, TOBACCO AND OTHER DRUGS IS ENDEMIC.”

STUDY OVERVIEW:

The aim of this study was to estimate the number of deaths among those released from prison in Australia in 2007/08, within the first four weeks and the first year after release. Researchers generated two independent, national estimates, based on population-level record linkage studies in NSW and WA respectively. Key findings include:

- Among those released from prison in 2007/08, between 449 and 472 died within one year of release, with between 68 and 138 dying within four weeks of release. The vast majority of deaths were preventable, with between 31 per cent and 45 per cent due to drug-related causes. By contrast, in 2007 there were 45 deaths in prison across Australia, and almost all of these deaths were due to natural causes.

- The study concluded that the annual number of deaths among recently released prisoners in Australia is orders of magnitude greater than the annual number of deaths in custody. Evidence-based preventive interventions are urgently required.

- There is an urgent need to establish a national system for routine monitoring of ex-prisoner mortality, to equip policy makers with the tools necessary to make evidence-informed decisions.

POTENTIAL RESPONSES BASED ON RESEARCH FINDINGS:

- The development and rigorous evaluation of evidence-based preventive interventions is required particularly focusing on drug-related deaths and suicide.

- Some interventions are already strongly supported by evidence: for example naloxone, the overdose reversal drug, appears to be both effective and low risk. However, the reasons for drug-related death post-release are complex and there is no ‘magic bullet’ solution.

- Interventions to prevent suicides in this population are also urgently required, however, the evidence base to inform these interventions remains weak. Further research to understand changes in mental health among recently released prisoners will inform such interventions.

- Establish a national system for routine monitoring of ex-prisoner mortality, via record linkage. The technical capacity already exists, and systems to protect privacy are well established. Key to establishing this long-overdue system is national leadership, to ensure commitment and collaboration across jurisdictions.

For more information on Burnet’s Justice Health Research and findings please contact Dr Stuart Kinner on 03 8506 2368

faceted, cross-sectoral, tailored to the target group and crucially, delivered both pre and post-release.

Since the 1991 Royal Commission into Aboriginal Deaths in Custody, considerable attention has been devoted to monitoring deaths among Australian prisoners. According to the National Deaths in Custody Program (NDICP), the annual number of prisoner deaths peaked at 76 in 1997, falling to 45 in 2007. Dr Kinner’s estimates for ex-prisoners are much higher and indicate an urgent need for a comparable system to monitor deaths among ex-prisoners.

“Because our estimates are a function of prison releases, the indirect estimation method that was used here is unsuitable for future monitoring purposes. One cost-effective method for such surveillance would be through routine, national linkage with the National Death Index, either as part of the new National Minimum Dataset for prisoner health, or to complement the NDICP. There is growing recognition in Australia of the public health benefit of record linkage and systems to protect the privacy of individuals are well established,” Dr Kinner said.
The most advanced treatment now available, combination anti-retroviral therapy (c-ART), is a life-long therapy, and providing these treatments globally – particularly to low income countries where the need is high – costs national health budgets millions of dollars each year.

Both researchers and patients alike thought a cure was imminent when c-ART was first introduced in the mid 1990s. As Professor Lewin told COMOS magazine: “When combination anti-retroviral therapy made its debut at the International AIDS conference in Vancouver in 1996, everyone thought it might be a cure.”

PROFESSOR LEWIN has joined some of the world’s best HIV researchers having been awarded $20 million of the $40 million grant pool for the sole purpose of finding a cure for HIV – emphasising that it is indeed a cure, not further treatment, that is really needed.

While modern drugs for HIV may have saved millions of lives, these treatments come at a high cost. A person receiving treatment remains at increased risk of other ageing-related disease such as diabetes, heart disease and early onset of dementia. HIV-infected patients taking anti-HIV drugs still have a reduced life expectancy. The most advanced treatment now available, combination anti-retroviral therapy (c-ART), is a life-long therapy, and providing these treatments globally – particularly to low income countries where the need is high – costs national health budgets millions of dollars each year.

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The National Institutes of Health in the United States has awarded three new networks of HIV researchers a funding boost of $40 million to enhance research into finding a cure for HIV. Burnet’s Co-Head of Centre for Virology, Professor Sharon Lewin is at the forefront of this effort – she is one of a group of seven researchers (and the only Australian) awarded one of the biggest investments into HIV research in history.

The funding comes as Professor Lewin, and fellow Burnet researcher Dr Paul Cameron and their team, last year made a major discovery in identifying how HIV enters resting cells and goes to ‘sleep’ – what HIV researchers call HIV latency.
the virus from infecting new cells and the amount of virus in patient’s blood plummeted to undetectable levels within weeks of taking the drugs. It was initially assumed that prolonged treatment would lead to eradication of the virus altogether.

But it was not to be. Within weeks of stopping c-ART HIV mysteriously re-emerged in the patient’s blood. The hope for finding a cure for HIV became a pipe-dream; many people began to question the efficacy of spending so much time and money on something that seemed impossible. Instead, says Lewin, “...people focused on developing better drugs, getting the drugs to countries that were in greatest need and developing vaccines, microbicides and other forms of prevention... with some amazing successes in each of these areas of research.”

But not everyone lost hope of a cure, and with every knockback researchers have received, their understanding of the virus has increased. The surprise re-emergence of the virus in patients receiving c-ART treatment, while disappointing, sparked a new line of questioning for researchers: where had these seeds of the virus come from?

HIV LATENCY
In 1999, researchers showed that reservoirs of latent HIV virus was the problem – that is, that HIV virus can lie dormant in the cells of patients for long periods of time, remaining unaffected by c-ART. The virus can then reawaken once treatment has been interrupted, and cause re-infection.

While there are many cells that can harbour latent HIV virus, most of the latent virus is in ‘resting memory’ CD4 T-cells. The long life of these cells, combined with a tight control of HIV expression, make these cells the ideal hiding place for the virus.

PROMISING DISCOVERY
Understanding the basic mechanisms of how HIV latency is established and maintained in resting memory CD4 T-cells is paramount to developing therapeutics that may lead to a cure.

While researchers have recognised HIV latency since the late ’90s, what has not been understood is the pathway the virus uses to enter the resting cells. There is also a great need to find ways to eliminate latency once it is established.

After more than five years work, Professor Lewin and Dr Cameron, along with their team, have recently identified how HIV latency is established in resting memory CD4 T-cells. They have shown that a family of proteins, called chemokines, guide resting cells into the lymph node tissue, ‘unlocking the door’ and allowing HIV to enter and set up a silent infection.

Understanding this mechanism is a significant breakthrough, and will enable new treatments to be developed which could block latent infection. It may also allow researchers to find new treatments to flush-out latent virus already inhabiting resting cells; this is important as most people on c-ART treatment today will already have latently infected resting memory CD4 T-cells.

Studying resting memory cells in the test-tube, Lewin and Cameron are screening compounds that can flush the virus out of resting memory cells; two compounds that look interesting and potent include IL-7, and HDAC inhibitors. Both these compounds have already been tested in clinical trials for diseases other than HIV and there are some HDAC inhibitors that are already licensed for the treatment of certain cancers.

HOPE REMAINS
Lewin and Cameron’s recent discoveries have shown that there is light, albeit faint, at the end of the HIV tunnel. Funding provided by NIH to further this work will go a long way towards furthering our chances; as Professor Lewin says: “This funding will, without a doubt, accelerate the path to hopefully one day finding a cure for HIV. It’s a huge amount of money with the capacity to apply for more. The pressure is on, for all of us, to use the money wisely, do some great science and hopefully find a cure.”

For more information on Burnet’s HIV research visit burnet.edu.au

PROFESSOR SHARON LEWIN IS IN CHARGE OF THREE MAIN PROJECTS UNDER THE NIH FUNDING BOOST:
- To try and find a better way to track latently infected cells in patients on anti HIV drugs;
- To use the model of infected sleeping cells that her lab recently developed to screen new compounds that can wake persistent virus; and
- A clinical trial she is leading, looking at an existing cancer drug and how it might work on persistent virus in patients on c-ART.

“It’s all new research and it’s really exciting to be part of it. Not just because of the funding but it’s an opportunity for collaboration and access to amazing sample sets, and to be part of new research internationally in its earliest stages,” PROFESSOR SHARON LEWIN.
The Federal Government recently commissioned an independent review of the effectiveness of the Australian aid program. The review, led by Mr Sandy Hollway AO, examined the current systems, policies and procedures of the existing aid program and made a number of recommendations.
Australiа has a sizeable international aid program focused on assisting resource-poor countries reduce poverty and achieve sustainable development. The program is managed primarily through the Australian Agency for International Development (AusAID) with which the Burnet Institute is accredited and ranked ninth in its disbursement of development funding to non-government organisations (NGOs) globally. Since 2006, the international aid program has doubled with an estimated budget of $4.3 billion and is projected to double again over the next five years to 0.5 per cent of gross national income meeting the government’s foreign aid commitment. This is a bipartisan commitment supported by the Coalition.

The decision to fund overseas aid programs by the Australian government is based on three sets of criteria, which include: effectiveness, the capacity of Australian aid to make a difference, and our national interest. Our aid contribution should also meet a number of strategic goals: saving lives; opportunities for all; investing in sustainable economic growth; food security and private sector development; supporting security; improving governance and strengthening civil society; and preparing for and responding to humanitarian disasters and crises.

While the review found that Australia has a good aid program and is an effective performer by global standards, it made a number of recommendations to further improve the program as it grows, including the potential for scaling up of agricultural and medical research funded by the aid program.

Asia is home to almost two thirds of the world’s poor. The report noted that there are now more poor people in middle-income than low-income countries. The review confirmed that AusAID’s focus will remain in this region, especially with a very real emphasis on health, particularly in Papua New Guinea, East Timor, Indonesia and across the South Pacific microstates such as Kiribati, Nauru and Tuvalu. In addition, the review also indicated an increase in support for countries in sub-Saharan Africa with aid to be effectively delivered through partner agencies. This will provide new opportunities for Burnet to further contribute to improving the health of countries both in our immediate region and in Africa.

There is also a commitment to increase support to non-government organisations such as the Burnet Institute who work in tandem with local non-government organisations, governments, the United Nations system and other international agencies to deliver aid and to build long-term capacity and sustainability in poor communities.

The review recommended the doubling of the budget for the AusAID NGO Cooperation Program (ANCP), which supports accredited Australian NGOs to implement their own international development programs. Key areas which are to be addressed as a priority included water, sanitation and maternal and child health, but also other areas in which the Burnet Institute works. An increase in ANCP funding will enable Burnet to look at new opportunities and initiate programs that address AusAID’s priorities. The effectiveness of Australia’s aid program is significantly constrained by the lack of good governance in some countries, and the review recommended a lower level of expansion of aid to those countries until a change in practises could be demonstrated. It also indicated a reduction in support to those countries whose economic position has significantly improved to the point where they themselves are now donor countries, for example India and China. This change may impact on Burnet’s proposed new bilateral health project in Tibet, as well as an extension of the China Australia HIV and Health Facility (CAHHF) currently managed by the Institute.

The review also proposed a number of smaller flagship programs be identified which focus on specific sectors, one of which includes the elimination of malaria from the Pacific. Given the extensive work on malaria undertaken by the Institute, potential opportunities are available for Burnet to participate in these programs.

Burnet Institute currently has 13 offices in seven countries but also works in many other countries through local partners to deliver practical programs that improve the health of people in low-income countries. While some aspects of the review may impact on the Institute’s on-going work in more developed countries such as China, potential opportunities for the Institute to play a greater role have emerged across the Pacific, sub-Saharan Africa and in the poorer countries of South East Asia. Overall, the review provides a solid framework for improving Australia’s response to the issues of global poverty, and Burnet will continue to play an increasingly important role.

For more information about Burnet’s international aid program please contact Professor Mike Toole on 03 9282 2111.
In celebrating excellence, we recognised the talent and dedication of many people who made extraordinary commitments to furthering the vision and mission of the Institute over the past year. In doing so they have helped build Burnet’s reputation as one of the leading medical research and public health institutes in the region. This would not have been possible without the financial support of many private philanthropists and Trusts and Foundations, which has enabled the further development of existing research and public health programs and the initiation of new programs.

We take great pride in the level of excellence and innovation in the research and public health activities that our staff undertake, and we are passionate in our commitment to working and growing together to create a healthier world.

The Institute thanks all philanthropic partners for their significant contributions over the past year and for helping us to achieve better health for those poor and vulnerable communities that we serve.

It is difficult to thank everyone who has contributed to the Institute over the past year but we would especially like to acknowledge the following donors who have been wonderful supporters:
Mr and Mrs Kel and Rosie Day
Vaccine research assisted by a Benchtop Flow Cytometer
Kel and Rosie Day’s previous donations have enabled Burnet scientists to purchase state-of-the-art equipment, which has made a significant difference to the efficiency and outcomes of our research projects. This donation has part funded a benchtop flow cytometer which will greatly benefit our research capability and support various vaccine development projects including those of HIV, malaria, hepatitis C and cancer immunotherapy that require high throughput flow cytometry screening.

“This cutting edge new flow cytometer will allow us to take some of our exciting laboratory research into clinical trials of novel vaccines and therapies. This will speed the development of much needed vaccines for HIV, hepatitis C and malaria, as well as therapies for autoimmune diseases”

Associate Professor Rose Ffrench, Head, Viral Immunology Group, Centre for Immunology

The Ian Potter Foundation
Malaria research in a state-of-the-art laboratory
We are extremely grateful to The Ian Potter Foundation for funding the establishment of the Malaria Research Laboratory. The donation will fund the laboratory fit-out and high-technology equipment to house Dr James Beeson and his team of malaria researchers in the broader context of our malaria vaccine program.

It will also support the purchase of equipment for the wider Centre for Immunology, with more than 60 staff and students headed by Dr Beeson.

“Malaria continues to kill almost one million people per year, most of whom are children under five years of age. Effective control of malaria will rely on the development of malaria vaccines that can be delivered to these populations. The new laboratory facilities and equipment are critical for our work towards the development of malaria vaccines and other approaches to prevent and treat malaria.”

Dr James Beeson, Head, Centre of Immunology

Ramaciotti Award for Biomedical Research 2010 (Perpetual Trustees)
For purchase of a major piece of equipment
This grant has enabled us to purchase the Odyssey scanner; a powerful piece of equipment that will be used to characterise and monitor key molecules involved in diseases. Labs will use the scanner to measure protein levels and interactions to demonstrate their function, leading to new diagnostics, treatments and vaccines.

Blake Dawson
HIV work in Papua New Guinea
Over the next three years our primary goal is to implement point-of-care CD4 testing in PNG, especially in remote and rural areas, in order to increase access to therapy for HIV-infected individuals in PNG and thus to improve their health care. This generous donation will ensure the HIV work in PNG is continued.

“This donation will enable Dr Jessica Markby to continue her work in capacity building and laboratory strengthening in PNG, through quality management, laboratory safety, creating standard operating procedures, staff recruitment and mentoring, and introducing collaborative research projects to strengthen evidence based clinical practice in PNG.”

Professor Suzanne Crowe, AM, Head of the Centre for Virology

Dr Edward and Mrs Beverly Brownstein
Mozambique and Southern Africa
This generous donation will enable us to continue our work in southern Africa and to make a significant difference to the lives of many people in this region, particularly the poor they started working in the communities educating others about HIV and AIDS. Women with husbands or partners encouraged their male partners to be counselled and tested and start treatment if they tested positive.

“Mozambique has the highest burden of HIV and AIDS of all the countries where Burnet works. While we have received funds from the Australian Government to build the capacity of local partners, the Brownstein’s contributions have allowed some of those partners to implement innovative community-level activities to reduce the impact of HIV and AIDS on their lives.”

Professor Mike Toole, Deputy Director and Head, Centre for International Health

Cancer Research Trusts 2010 – Equity Trustees
Can primary health care identify the diverse population at risk of liver cancer associated with chronic hepatitis B?
The Burnet Institute is running a program to improve the management of people at risk of chronic hepatitis B. Chronic hepatitis B is a key health priority in Australia, this program would aim to reduce the proportion of people with chronic infection who have not been diagnosed by developing a clinical tool that supports general practice to make the diagnosis.

Mr Peter Falvey
Southern Africa
This generous donation will support Burnet’s work in southern Africa and specifically support effective program design and evaluation in this region.

With the threat of new and emerging viral infections and the ongoing impact of HIV, hepatitis and measles in this region, this work is critical to helping those in need.

*After more than ten years working in Mozambique to
support responses to HIV and AIDS, Burnet is looking to extend our work to improving maternal and child health. We will be analysing the maternal and child health needs in other Southern African countries, such as Zimbabwe and Malawi. In addition, we will review our potential role in reducing the harm associated with injecting drug use, which has been increasing in certain East African countries, such as Tanzania. Mr Falvey’s contribution gives Burnet the flexibility to look more broadly at our potential to work more effectively in Africa.”

Professor Mike Toole, Deputy Director and Head, Centre for International Health

H & L Hecht Trust 2011 (managed by Perpetual Trustees)

Research into APOBEC3 blockade of HIV

In line with Burnet’s mission this critical research will define how APOBEC3 proteins retard HIV movement in cells, with results advancing existing knowledge and potentially informing a new antiviral strategy.

“This essential funding allows my live fluorescent microscopy research to continue, which examines how cell APOBEC3 proteins disrupt HIV movement in human cells after virus invasion. This research will advance our knowledge of poorly understood areas of HIV biology and may further unveil new targets or strategies for developing new drugs to treat patients with drug-resistant HIV.”

Dr Jenny Anderson, Senior Research Officer, Centre for Virology

Ms Joanne Kirk, Stateless Systems Centre for International Health

This funding was generously provided to support the work of the Centre for International Health and its priority projects. Five projects were identified which covered a broad range of capacity-building and health promotion initiatives.

The support of Stateless Systems has provided significant funding for five international health programs, which focused on infectious diseases prevention and health promotion activities. The funding was spread across five countries in South East Asia and included: HIV prevention in Lhasa, Tibet; building a comprehensive response to HIV in Bali, HIV peer-education programs in Laos; responding to measles vaccination in Papua New Guinea; and promoting the health of older people in Sri Lanka.

Professor Mike Toole, Head, Centre for International Health

Mr Robert Milne

China Program Development

Board member and keen supporter of Burnet’s ongoing program in China, Rob Milne has provided funding towards a scoping exercise and the development of a business plan for the Institute’s long-term future in China. This funding has already been leveraged for further investment from donors interested in supporting the Institute’s future in China.

As this fast-changing market continues to evolve Burnet’s engagement with China needs to remain responsive – this is likely to include a shift from traditional aid and health development programs to a more translational/commercial focus for the Institute. The need for a well-researched and clearly articulated business plan for the coming years is essential. This donation has supported the first of several business development trips to China and will also support the development of a business plan by end 2011.

“This funding has been critical in progressing the China team’s planning. With this support we have been able to invest in staff time for strategic planning, meet with stakeholders in Australia and in China and develop proposals for future collaboration, demonstrating our commitment to a long-term presence in China that would simply not have been possible without this generous investment.

The initial scoping visit in early June 2011 identified key areas of technical collaboration of interest to the Ministry of Health, potential partners/collaborators, and a potential location for a Burnet office in the south west province of Yunnan. A further visit to China is anticipated to identify and negotiate concrete opportunities for the Burnet to initiate set up operations. The business case for a whole-of-institute China program will be presented to the Board by year end.”

Lisa Renkin, Head Burnet Institute China Program

THANK YOU

In addition to those above, a special thank you to these donors who have supported Burnet’s priority projects through their discretionary donations:

Mr Pat La Manna, OAM and Mrs Helen La Manna

Mr Alastair Lucas, AM

Miller Foundation

Mr Allan J Myers, AO, QC and Mrs Maria Myers, AO

Ms Sarah Orloff

Dr Elizabeth Xipell, Gras Foundation Trust

The Harold and Cora Brennen Benevolent Trust 2011 (Equity Trustees)

Mrs Anne Cassidy

Professor Brendan Crabb

Mr Mal and Mrs Sue Edwards

Goldschlager Family Charitable Trust

Lord Mayor’s Charitable Foundation

Mr R Gordon Cameron – W Marshall & Associates

Dame Elisabeth Murdoch, AC, DBE, CBE

The priority areas which have benefited from this discretionary funding are:

• New equipment purchases
• International health programs in Papua New Guinea and Laos
• Research programs into inflammatory diseases such as rheumatoid arthritis
• Malaria research
• Laboratory fitouts.
**Talking Heads**

**Ruth Rosh**

I commenced my role as Head of Advancement one and a half years ago, and in that time I have enjoyed learning about the amazing work of the many scientists and researchers at Burnet.

My background in marketing, public relations and fundraising combine to support my key objective in this new role, which is to communicate Burnet’s work to those who may be in a position to assist in securing sustainable funding to support the Institute’s priority programs.

The broad spectrum of work – from the laboratory to the field, both locally and internationally, provides a wonderful opportunity to engage with a wide range of prospective and current supporters.

As well as spending time with our program staff, I have the privilege of getting to know many people – private philanthropists, those who work in the Trusts and Foundations sector, and those who implement social responsibility programs within the corporate sector.

I find it most inspiring to work with people and organisations who are giving their time and money, and who are committed to social justice and social change, and to finding a better life for those in difficult circumstances.

Much of my time is spent networking and meeting these people at various events organised by Burnet, or at other functions, and I love the opportunity to talk about Burnet’s work and its impact on improving the health of many people, both here in Australia, and overseas.

**Staff Spotlight**

**Dr Niramonh Chanlivong**

Country Program Manager, Burnet Institute, Vientiane, Lao PDR

Sabaidee! My name is Niramonh.

A Lao national, I was trained as a medical doctor in Prague, in what was then Czechoslovakia. I gained experience in health education in Tamil Nadu, India, and completed a Masters of Public Health course at University of NSW.

Before joining Burnet I worked with the Lao Ministry of Health as Deputy Director of the Centre for Information and Education for Health. I came to Burnet in 1998 as a Project Coordinator, the only staff member in Laos at that time! Since then we have expanded to more than 20 staff. My time here has passed quickly, which confirms how much I enjoy being part of Burnet.

My role includes liaising with colleagues in Melbourne, representing Burnet in a range of settings (including the Global Fund Country Coordinating Mechanisms), and providing technical support to our staff in areas such as peer education, behaviour change, and mother and child health and nutrition. I am also involved in Burnet’s many research studies, projects and consultancies.

A big part of my job is engaging with our government counterparts. My focus when working with government stakeholders and communities is capacity building and I enjoy seeing the success as our counterparts gain knowledge, skills and confidence. In my years at Burnet I have facilitated capacity building processes in HIV and STI strategic planning for many of our government counterparts, including the Lao Youth Union, the Ministry of Transport, and the military and police.

In recent years, I have also been directly involved in two large HIV prevention and infrastructure projects supported by the Asian Development Bank and AusAID. These projects have given me the opportunity to work closely with private companies such as a local coal mine and a Chinese-run casino – both very challenging!

Looking forward, I hope to expand Burnet’s work from its current HIV and STI prevention focus to a broader health program, with greater emphasis on areas such as mother and child health and nutrition – two key public health issues in Lao PDR. I am also looking for ways to get Burnet more involved in the response to malaria, through the latest round of funding from the Global Fund for HIV, TB and malaria. So as you can see, I’m keeping busy!

**Student Focus**

**Kerry Ko**

Centre you work in: Centre for Immunology

**Supervisors:** I’m supervised by Professor Mark Hogarth and Dr Maree Powell.

**What is your project?** I’m in the second year of my PhD, which involves investigating an interesting new group of white blood cells called Th17 cells, a type of T-cell that is thought to play a role in inflammation; in particular our group is interested in combating rheumatoid arthritis.

**Where were you before Burnet?** I completed my degree at Melbourne Uni, then Honours at WEHI. I began working in my current lab as a research assistant a few years ago before taking the plunge into doing a PhD. Going back into student-life took a bit of getting used to, but it’s necessary to further my career in science.

**What is your average day?** To keep myself stimulated, I try to plan my days to have a mixture of experiments in the lab and data analysis at the computer. Then I also try to fit these around the seminars that are given around the campus and meetings with my supervisors.
**THE VIRAL FUSION LABORATORY**

Located within the Centre for Virology, the Viral Fusion Laboratory conducts studies into two of the world’s most destructive human pathogens – Human Immunodeficiency Virus (HIV) and hepatitis C Virus (HCV).

HIV infects more than 33 million people worldwide and results in almost two million deaths each year. HCV infects more than 180 million people and is a major cause of liver cirrhosis and liver cancer. As a consequence, HCV is now the major indicator of liver transplants in Western countries. No vaccines are available for HCV or HIV.

While the use of highly-active antiretroviral therapy has seen a dramatic increase in the life expectancy of HIV-infected people, the virus still cannot be eliminated. Over time, viruses can become resistant to the antiviral agents and patients may succumb to AIDS.

Similarly, antiviral therapies for HCV are often ineffective, requiring patients to undertake extensive treatment for between 24 and 48 weeks, with viral clearance only being achieved in 40-80 per cent of people. The side-effects of current HCV antivirals are severe, often resulting in people withdrawing from treatment early.

HIV and HCV attach to the surface of target cells via specific interactions with cellular receptors. Both HIV and HCV must then undergo the process of membrane fusion before they can enter the cell and begin their replication cycle.

Burnet’s Viral Fusion Laboratory aims to gain better understanding of this membrane fusion process. This will hopefully lead to the identification of new targets for the development of improved antiviral agents that will target this critical first step of infection.

Membrane fusion occurs when the fatty bilayer that surrounds the virus merges with the fatty bilayer that surrounds our cells. A bilayer is a thin membrane made of two layers of lipid molecules, which lie as flat sheets and form a continuous barrier around cells. When the bilayer of our cells merge with that of the virus it forms a small pore, through which the genetic material of the virus can pass.

Viral glycoproteins embedded on the surface of the virus mediate the processes of attachment and membrane fusion. These proteins are highly flexible and can change their shape during attachment and fusion.

One of the major aims of the Viral Fusion Laboratory is to understand how the glycoproteins mediate attachment and fusion, and how the glycoproteins change their shape. The parts of the viral glycoproteins that mediate attachment and fusion involve regions that generally maintain their structure, which means that understanding how they function can reveal new conserved targets for the development of new antiviral agents.

Recent studies on the HCV glycoproteins conducted by Burnet PhD student Johanna Fraser (nee Dean), have revealed that the viral glycoproteins exist in a reduced state prior to cellular attachment, but change their shape dramatically after attachment to the cell. The reduced state of the viral glycoproteins is maintained by free sulphhydryl groups present in the two viral glycoproteins. By chemically blocking these free sulphhydryl groups we can completely block the ability of the virus to enter liver cells. These results were published in the Journal of Biological Chemistry, and reveal a new target for the development of antiviral agents that block HCV replication.

Recent studies on the HIV glycoprotein complex gp120/gp41 have shown that the two ends of gp41 come in close proximity at a late stage of viral fusion. Interference with the formation of this interaction surface can block membrane fusion and viral entry. The regions of gp41 involved in this interaction are highly conserved in HIV strains and form an ideal site for the development of antiviral agents that block this necessary stage of viral replication.

These projects form the basis of our future antiviral development program for HCV and HIV, and we look forward to sharing more results from these projects as they progress.

For more information please contact Associate Professor Heidi Drummer on 03 9282 2179.
Malaria is a disease of major global importance, particularly affecting young children and pregnant women, and is one of the world’s leading causes of death and illness.

As such, it is a major focus of Burnet’s work. The Institute’s program aims to advance the development of vaccines and new treatments for malaria, and develop approaches or interventions to prevent and control malaria in affected communities.

Burnet’s malaria program has expanded significantly in the past three years and now involves staff and students across all four Centres of the Institute. Research groups that work primarily on malaria include those led by Professor Brendan Crabb, Dr Paul Gilson, and Dr James Beeson (Centre for Immunology); and Professor John Reeder (Centre for Population Health), and Dr Freya Fowkes, who works jointly between the Centres for Immunology and Population Health. Other researchers also contribute expertise in malaria immunology and vaccine development, including Associate Professor David Anderson, Dr Anthony Jaworowski (Virology), and Professor Mark Hogarth (Immunology).

Research activities are complemented by strategic planning initiatives conducted in malaria-affected countries by our Centre for International Health, headed by Professor Mike Toole. The program works with partners in malaria-affected countries in Asia, the Pacific region, and Africa.

This multi-disciplinary approach enables Burnet to translate laboratory discoveries through to clinical studies or population interventions, identifying major challenges in malaria treatment and control that can better direct research to find solutions.

For more information on Burnet’s malaria work please visit burnet.edu.au

**DENDRITIC CELL RESEARCH LABORATORY**

Dendritic cells are sentinels of the immune system and are important in recognising viruses and other pathogens.

On the surface of and within dendritic cells are numerous ‘pattern recognition receptors’, special molecules that are able to sense the presence of pathogens.

Many different subsets of dendritic cells exist between and within the different organs in our bodies. One of the key differences amongst these subsets is the expression of different types of pattern recognition receptors which enable the dendritic cells to recognise different types of pathogens and/or their products.

A specialised dendritic cell in mouse and humans expresses a pattern recognition receptor that senses double-stranded (ds)RNA – which is produced inside cells infected by many viruses including SARS, hepatitis viruses and HIV.

Together with scientists in Munich, Burnet’s Dendritic Cell Research Laboratory has recently shown that in response to dsRNA products, these specialised dendritic cells produce a special type of anti-viral hormone called interferon-lambda. Interferon-lambda has only recently been characterised as important in anti-viral responses, although it is still not clear exactly what role it plays in viral diseases.

The Dendritic Cell Research Laboratory, headed by Dr Meredith O’Keeffe, is further characterising dendritic cells throughout the body that make interferon-lambda, with an aim to understand how these cells contribute to immune responses during viral infection. Specifically, they are trying to understand how interferon lambda is beneficial during a viral infection, and are interested to discover exactly where in the body this hormone is made and which cells in the body are able to respond to it.

They have also found that dendritic cells can produce interferon-lambda during autoimmune conditions. This means that production of interferon-lambda may in fact be a double-edged sword: beneficial to combat viruses, detrimental during certain types of autoimmunity.

Understanding exactly which cells produce this hormone may allow researchers to design therapies that can enhance responses to viral infection, or dampen responses during autoimmune diseases that attack the body’s own cells such as lupus and rheumatoid arthritis.

For more information please contact Dr Meredith O’Keeffe on 03 9282 2139
Our emergency health services can respond quickly and effectively to overdoses with ambulances generally carrying naloxone. In line with programs currently operating in numerous countries overseas, there are calls to make naloxone more readily available to friends and family of people who use opioids such as heroin, so that they can respond quickly to overdoses as they arise. Our researchers are actively involved in these initiatives in the Australian Capital Territory, and are also involved in studies to determine whether naloxone can be administered intranasally rather than intramuscularly (as is current usual practice) to eliminate the use of needles in overdose response.

For more information on this project please visit burnet.edu.au or contact Associate Professor Paul Dietze on 03 9282 2134.

GLOBAL EPIDEMIOLOGY OF HEPATITIS B AND HEPATITIS C AMONG PEOPLE WHO INJECT DRUGS

A world-first study has revealed approximately 10 million injecting drug users (IDUs) have been exposed to hepatitis C (HCV), that’s two thirds of the global IDU population.

Burnet Institute’s Professor Louisa Degenhardt led the systematic review, which also discovered 1.2 million IDUs have hepatitis B (HBV). Injecting drug use is an important risk factor for transmission of viral hepatitis but before this review was published in The Lancet in July, there was no evidence detailing the enormity of the issue.

The study received funding from the US National Institutes of Health, the World Health Organization’s HIV department and the National Drug and Alcohol Research Centre, UNSW.

Previously, public-health responses to blood-borne virus transmission in IDUs has mainly centered on HIV; this study shows that viral hepatitis needs to receive greater attention than it does at present.

“There are growing efforts to bring viral hepatitis treatments into the same (lower cost) access framework as HIV antiretrovirals,” Professor Degenhardt said.

Access to treatments for viral hepatitis must also be improved in high-income countries, with recent estimates suggesting that only a fraction of those who could benefit are currently receiving antiviral therapy.

Almost 80 per cent of people exposed to HCV develop chronic infection, and about a quarter of those chronically infected with HCV die from liver cancer.

The percentage of adults exposed to HBV who go on to develop chronic infection is significantly lower than that of HCV, however 90 per cent of infants who are exposed to the virus will develop a chronic infection.

This highlights the importance of the universal infant vaccination against HBV in controlling the virus in the long-term.

“Efforts to prevent, treat, and reduce harms related to liver disease in IDUs are essential... large numbers of IDUs infected with HCV and significant morbidity resulting from this infection, means that the health and economic costs of HCV transmitted by injected drug use might be as high as (or higher than) those of HIV,” Professor Degenhardt explained.

The authors stress that while attention should be shifted to prevention, treatment and care, there is a desperate need for high quality surveillance of viral hepatitis.


For more information on this project please visit burnet.edu.au or contact Professor Louisa Degenhardt, on 03 8506 2341.
VILABOULY MOTHER AND CHILD HEALTH PROJECT

In remote Vilabouly district in the south of Laos, Burnet is implementing an important project that aims to build the capacity of district health officials to plan, conduct and review interventions for women and children.

The project also directly supports health promotion activities within targeted villages. Outreach teams travel to target villages on a bi-monthly basis to offer services including growth monitoring, vaccinations and check-ups for children, ante-natal and post-natal care for women, and health and hygiene education. The project also provides the district hospital and local health centres with much needed equipment, and a simple database has been developed that helps health staff keep track of their patients. A range of information materials have been produced as well, including a short local-language film on nutritious feeding and a radio spot that is aired on a weekly basis.

In its third and final year now, the project has faced a number of challenges. Many target villages are difficult to access, particularly during the rainy season. A number of community members also come from ethnic groups and cannot speak the Lao language, making communication challenging.

Despite these difficulties, there are some encouraging signs of success. While a formal evaluation will be conducted in December this year, project staff report that immunisation of children under 12 months is up from around 50 per cent to just over 90 per cent. Meanwhile, growth monitoring has identified malnourished infants and the project had referred these to appropriate treatment services and monitored their progress.

There is also evidence that more women are choosing to exclusively breastfeed their babies for at least six months, which can have significant benefits on infant health. Through the outreach services larger numbers of women are also benefiting from ante-natal and post-natal care.

Finally, the increased ability and confidence of local health officials is noticeable. Vilabouly district was recently selected as a ‘study site’ for health authorities from neighbouring districts to learn from. The increased capacity of health staff is particularly encouraging; not only as a mark of success, but it is also an indicator that this success will be maintained into the future.

Project funded by MinMetals Group (MMG)/Lane Xang Minerals Limited (LXML).

A BRIGHTER FUTURE FOR BURMA

In May 2008, Cyclone Nargis made landfall in the Irrawaddy delta region of Burma, causing severe flooding with approximately 140,000 people killed or missing, and 2.4 million people displaced or severely affected.

This was the catalyst for the expansion of Burnet’s Burma program, becoming the Institute’s largest overseas program. From 2011 to 2015, the program will focus on maternal and child health; HIV prevention, care and treatment; and the health of elderly persons achieved through a capacity building model.

Burnet’s model of supporting civil society to deliver health services is unique in Burma. Recent political and social shifts within Burma may also open up opportunities for Burnet Myanmar (Burma) to trial more innovative approaches in addressing public health challenges.

Social and political change in Burma is being realised; highlighted by the new Government in October 2010 and the subsequent release of Aung San Suu Kyi. Further significant changes have included Aung San Suu Kyi’s ongoing talks with the Government on broader democratic change, the recent release of 200 political prisoners; President Thein Sein’s decision to abandon plans for a Chinese built hydropower dam on the Irrawaddy River, and the lifting of internet restrictions and increased media freedom. While there are still calls for more action, western leaders are calling President Thein Sien a reformer and dialogue between international donors and the government is increasing and becoming more effective.

During his visit to Burma in June 2011, Foreign Minister Kevin Rudd engaged positively with officials to trial more innovative opportunities for Burnet Myanmar (Burma) to support and prioritise public health care for vulnerable populations while engaging fully in the reform agenda in support of civil society and better public health outcomes.

For more information on our international programs visit burnet.edu.au
It’s a simple philosophy – help a child by helping their mother.

We urgently need donations to our Healthy Babies, Healthy Futures Appeal; your gift can change the future for vulnerable mums and their bubs around the world.

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To make a donation go to burnet.edu.au