A Submission to the Productivity Commission

Science and Innovation Study

from

The Australian Society for Medical Research

Returns on investment in Health & Medical Research

Government investment in health and medical research has reaped significant economic and social benefits for Australians. There have been considerable gains in knowledge, health and wealth as a flow on from investment in science and innovation. The health and medical research industry improves health, creates jobs and has positive economic returns to Australia. The Access Economics Report (Exceptional Returns – The Value of Investing in Health R&D in Australia)[1] showed that for every $1 invested in Health and Medical Research, there is a $5-$8 return to Australia's Economy. For example, commercialisation of health and medical research has been growing at 16% per annum and 3,500 to 4,000 knowledge-based jobs have been created[2].

Australian medical research scientists have a long history of discovery and innovation. Examples that have had or will have significant impact on health, well-being and wealth include:

- Development of the bionic ear and establishment of a highly successful company, Cochlear, around this invention
- Discovery of helicobactor pylori as the cause of gastric ulcers
- First anti-influenza drug (Relenza) developed in Australia and licensed by Biota Holdings to GSK
- Development of a vaccine to prevent the human papilloma virus
- Cytopia Ltd has developed a JAK3 kinase inhibitor for the prevention of transplant rejection

A major goal of health and medical research is to improve health and well-being. Peter Wills and his team recognised in the 1999 review of Health and Medical Research[3], that research could have direct economic benefits by (i) reducing health care expenditure at a time where health costs are increasing and (ii) deliver better value health care from the value of health investment.

---

[1] Exceptional Returns – The Value of Investing in Health R&D in Australia, Access Economics Report 2003.
[2] Sustaining the Virtuous Cycle: For a Healthy Competitive Australia (Grant Review), released December 2004
[3] 1999 Health and Medical Research Strategic Review (Wills Review)

Public Support for health and medical research

Australians strongly support health and medical research and recognise the health, social and economic benefits[4]. They strongly agree (>60%) that: (i) lack of funding means that Australian discoveries are often commercially developed in other countries; (ii) new discoveries and inventions create new medicines, devices and vaccines to produce and export; (iii) and health and medical research creates jobs and new business through new discoveries and inventions.

The importance of increased funding for health and medical research was recognised by the Australian Government in the 2006 Federal Budget, and builds on the 1999 Wills Review[3] The Budget provides an additional $905 million for Australian Health and Medical Research.

It is important that health and medical research has sustained and increased funding over time. Increases in health and medical research funding are currently not indexed and the long lead-up times to securing increased investment mean that initial gains in knowledge, productivity, innovation and skills development can be lost. Increases in Government investment are therefore vital to maintain the high standard of research excellence and innovation in Australia.

Current impediments to Australia's Innovation system

Despite examples of health and medical research innovation, many discoveries that have commercial potential are not developed in Australia due to lack of funds at the initial stages of development or due to difficulty in attracting industry backing. National Health and Medical Research Council (NHMRC) Development Grants have provided an avenue for early stage development of commercially promising projects but there are limited funds available beyond this funding. Incentive schemes to attract industry or venture capital investment need to be considered to improve returns on investment in health and medical research innovation.

Impediments to science and innovation have hampered a number of areas. The Investment (Grant) Review of Health and Medical Research[2] released by the Federal Government in December 2004 made a number of recommendations including reorganisation of the NHMRC to administer research funds in a more streamlined and strategic fashion and an increase in Federal government investment in health and medical research to $1.8 billion per annum by 2008-9, bringing Australia up to the OECD average level of investment of 0.2% of GDP. Inefficiencies at the NHMRC are being addressed with the organisation now a statutory authority and reforms underway. With the recent appointment of the new CEO Prof Warwick Anderson, organisational reform is expected to continue.

The issue of ongoing and indexed funding remains an important obstacle. The welcomed increase in health and medical research funding announced in the May 2006 Federal budget, brings Australia's investment to the OECD average level of investment of 0.2 % of GDP. A long term (20 year) bipartisan strategy for investment in health and medical research will cement Australia's commitment to health and medical research and science and innovation, attract and retain our best and brightest and translate to health, economic and social benefits to Australians.

[4] Research Australia public opinion polls 2005

The critically-needed increase in health and medical research funding announced in the May, 2006 Federal budget, is an important investment in Australia's future and addressed key recommendations of the Grant Investment Review.

Training and Human capital

Underpinning the knowledge, health, innovation and wealth gains is a highly-trained health and medical research workforce. However, we believe there a number of barriers towards maintaining this appropriately trained workforce that will impact on future science and innovation. Many young researchers perceive medical research as a career option that is not well paid and high risk. Unfortunately some of our outstanding young research students are not even considering PhD opportunities or if they do, they are not progressing to postdoctoral positions. While many of their peers in other careers may have achieved financial stability, they see researchers around them struggling on with little security and a highly insecure income. Many of our best students are now rejecting the research career option as unsustainable.

Training to become a medical researcher requires dedication, with on average four years of undergraduate training, followed by four years postgraduate study and between three to six years of postdoctoral advanced training. Once this extensive training regime is completed, medical researchers enter the next phase of their careers. During this period early career researchers are expected to compete for NHMRC grant funding often for their own salaries and those of their research staff and laboratories. With a 1 in 5 success rate for project grants, this can be discouraging, particularly at a point when many are embracing mortgages and supporting young families.

There is a recognised large gap between early career development awards and the more senior NHMRC Fellowship scheme[2]. The majority of researchers stumble at this major obstacle and will be lost to medical research altogether or take up overseas appointments. In 2003, there was only sufficient funding for 50% of applicants ranked in the top 10% in their field internationally. If we are to attract and retain our best and brightest, mid-career researchers need support at this critical time. The existing NHMRC Fellowship could be expanded and Senior Fellows' terms lengthened with the inclusion of mid-term reviews. The recent budget announcement (May 2006) of $170 million towards the Health and Medical Research Fellowships' Scheme will also help retain and attract the best and brightest very senior health and medical researchers, with Australia the ultimate beneficiary of their dedication and productivity.

National Health and Medical Research Council (NHMRC) Grant Application Process

Grant funding schemes within the NHMRC have recognised defects that include inefficient processes, short funding cycles and many grants lack sufficient infrastructure support.

The Wills (1999) and Grant (2004) reviews recognised obstacles and inefficiencies in the NHMRC administration and grant funding schemes and a number of welcome changes have been accomplished or are underway. It is particularly helpful to have direct communication from the CEO to the Minister for Health and Ageing.

A number of important initiatives within the NHMRC have included encouraging larger and longer grants (eg. 5 years as opposed to predominantly 3 years). ASMR supports further improvements to the funding schemes to ensure the best research and researchers are supported so that innovation and discovery can be encouraged. This is essential if Australia is to address and meet

its strategic health needs. Support of basic, translational and clinical research is paramount to strengthen innovation and positive health and wealth outcomes.

Competitive funding for Australian health and medical research is primarily supported by the NHMRC. However, gaining funding for high-risk innovative projects is often hampered by the criteria used to assess grant funding. Namely, NHMRC uses a merit based system that takes into account significance and innovation, track record and feasibility. While this system works well for many schemes it does not encourage or support proof-of-concept research. There is then a funding gap between moving proof-of-concept research into other funding schemes and this type of early stage research has not progressed to the level that will attract industry support. Limited funds are available via the NHMRC Development Grant scheme but the number and level of funding are low. Whilst Pre-Seed Venture Funds are available via a Federal Government Scheme (http://www.business.gov.au/Business+Entry+Point/), this is not available to research arising from Medical Research Institutes. With the increasing legal costs associated with patents, a funding stream would encourage the development of innovative and commercially attractive medical research discoveries can be progressed.

Infrastructure Programs

Infrastructure funding is crucial to support the costs associated with conducting research. In the past two years the NHMRC has provided direct infrastructure support through NHMRC Grants. The cost associated with supporting health and medical research is escalating and some state Governments provide limited infrastructure funding. In many cases this is insufficient to meet the need or not all organisations fit within the guidelines. Infrastructure support whether via direct public funds to organisations or institutions and via schemes such as the National Collaborative Infrastructure Strategy (NCRIS) as part of Backing Australia's Ability-Building our Future Through Science and Innovation (NCRIS), are essential in order for Australian health and medical researchers to keep at the cutting edge of technology and enhance their innovation potential. Mechanisms that recognise and support high-performing Australian medical research facilities that do not fit within the classic "institute" structure should be encouraged and resourced appropriately.

In summary, Australian health and medical research has a long and continuing track record in innovation and economic returns. With an ageing population, unsolved medical problems and biological threats, Australian medical research needs to stay at the forefront to be internationally competitive. Education, training and support of medical researchers is essential to meet the challenges and competition. Strong links between medical researchers, Government support and industry will be needed to bridge the gap and overcome barriers to innovation so that Australia can reap the benefits of its medical research discoveries.

A/Prof Maria Kavallaris
President-elect, ASMR

Prof Levon Khachigian
President, ASMR