



Mr Simon McKeon
Panel Chair, Strategic Review of Health and Medical Research
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March 2012

Dear Mr McKeon,

We write on behalf of the Australian health and medical research (HMR) sector in response to the call for submissions to the Federal Government's strategic review of HMR in Australia. Our submission summarises the overarching measures that are key to drive a 10 year strategic HMR plan for our nation. Many of the organisations listed on this letter will also be lodging individual submissions, which we urge you to carefully consider.

Why is it in Australia's interest to have a viable, internationally competitive health and medical research sector?

Of great concern is Australia's future health and aged-care expenditure¹.

- Health and aged care expenditure escalating from 9.3% of gross domestic product (GDP) in 2003 to 12.4% of GDP in 2033².
- Health system expenditure to grow from \$113 billion in 2012 to \$3.3 trillion by 2062³.

Investment in a viable and competitive HMR sector is an important and evidence-supported approach to mitigate our nation's current and future health and economic challenges. Australian HMR has a proven track record of delivering exceptional economic and health returns to the nation, contributing 3% of the total world HMR outcomes from only 1.1% of the expenditure; and delivering twice the Organisation for Economic Cooperation and Development (OECD) average per capita⁴.

Between 1993-2005:

- Australian HMR is estimated to have returned a net benefit of \$29.5 billion⁴.
- Every dollar invested in HMR returns on average \$2.17 in health benefits⁴.
- Australian HMR returns 117%, exceeded only by the mining and wholesale/retail sectors⁴.

Australian HMR also produces world-class research that is rapidly translatable into beneficial health outcomes.

- Development of Gardasil to vaccinate against 70% of cervical cancer has potential returns of 2.5:1 in terms of wellbeing⁴.
- Cochlear Pty Ltd, was developed from Australian bionic ear research, with markedly increased gains in quality-adjusted life years of recipients around the world⁵.
- Ongoing wellbeing savings attributed to the prevention and treatment for peptic ulcers and bipolar disorder, as well as reducing deaths from Sudden Infant Death Syndrome (SIDS) to one fifth of former levels⁶.

1. Australian Government, The Treasury 2010. Australia to 2050: future challenges – The 2010 Intergenerational Report.

2. Goss J 2008. Projection of Australian Health care expenditure by disease, 2003 to 2033. Cat. No. HWE 43. Canberra: AIHW.

3. Deloitte Access Economics, 2012. Extrapolated returns on investment in NHMRC medical research. <http://www.asmr.org.au/Publications.html>

4. Access Economics, 2008. Exceptional Returns: The value of Investing in Health R&D in Australia II. <http://www.asmr.org.au/Publications.html>

5. Lammers MJ 2011. The cost-utility of bilateral cochlear implantation: a systematic review. *Laryngoscope* 121:2604-2609.

6. Access Economics, 2003. Exceptional Returns: The Value of Investing in Health R&D in Australia. <http://www.asmr.org.au/Publications.html>

The health and economic benefits of investing in Australian HMR are dependent on our nation's well-trained and highly skilled HMR workforce, which performs outstandingly on an international scale⁷. For Australia to realise the full health and economic benefits of investment in HMR, we need to invest in both research and our nation's workforce. In addition, building and maintaining a critical mass of Australian HMR expertise is vital for assessing new therapies and technologies; and for the rapid response to unexpected health challenges e.g. H5N1 and Hendra viruses. Investment in Australia's viable and competitive HMR sector is a proven strategy to yield maximal health and economic benefits for alleviating the future projected and unexpected health challenges facing our nation.

How might health and medical research be best managed and funded in Australia?

To address this question, we first need to identify all HMR funding sources and their relative proportions of the total pool, as well as our nation's total investment in HMR. Funding for Australian HMR is derived from a range of sources: industry, private non-profit (PNP) organisations including philanthropists, and a suite of Federal, State and Local Government mechanisms.

- Health research and development (R&D) is performed by higher education facilities (44%), business (26%), PNP (16%) and Government facilities (14%)⁴.
- In 2004-05, Australia spent \$2.8 billion (0.38% of GDP) on health R&D, ranking our nation in the middle of comparable OECD countries⁸.

There is a clear need to identify the health and economic returns on investment from each funding source. This evidence-based approach will be critical for justifying long-term Government investment in HMR, as well as providing incentive structures to encourage philanthropy and commercial investment in health R&D. An example of a funding source that has been analysed for health and economic returns is the Federal Government, through the National Health & Medical Research Council (NHMRC).

- In 2011-2012, NHMRC investment represented 0.8% of Australian health expenditure (\$113 billion)³.
- Investment in the NHMRC between 2000-2010 is projected to save \$966 million in direct/indirect costs to the health system⁹.

Over the past decade, the advancements in information technology have enabled data management of NHMRC expenditure to be mined for its projected health and economic benefits⁹, as well as extrapolating returns on future increased investment³. Accordingly, linked database management of all Government funded HMR should be a powerful strategy for regular assessment and self-improvement of HMR outcomes.

The potential value in linking all Australian HMR together, through database management (eResearch), would be an ambitious but world-first exercise in monitoring and continually improving our nation's HMR output.

This approach comes at a time when new technologies and advancements in personalised medicine are being adopted into the clinic, and therefore we should also consider the cross-platform integration of electronic health (eHealth) and research (eResearch). This approach should lead to more effective translation of research outcomes, as well as enhance the potential for new discoveries.

3. Deloitte Access Economics, 2012. Extrapolated returns on investment in NHMRC medical research. <http://www.asmr.org.au/Publications.html>

4. Access Economics, 2008. Exceptional Returns: The value of Investing in Health R&D in Australia II. <http://www.asmr.org.au/Publications.html>

7. Schofield DJ et al. 2011 A crisis in the making? Education, ageing populations and the future of the medical research workforce *Med.Edu*.45:200-7.

8. Organization for Economic Cooperation and Development 2007. OECD Health Data 2007: Statistics and Indicators for 30 Countries, OECD, Paris

9. Deloitte Access Economics, 2011. Returns on NHMRC funded Research and Development. <http://www.asmr.org.au/Publications.html>

What are the health and medical research strategic directions and priorities and how might we meet them?

Our nation faces unprecedented health and economic challenges of an ageing population, the growing burden of lifestyle-related chronic diseases, and disproportionate levels of disease amongst Indigenous populations^{1,2}. Australia's economic burden associated with health and ageing is projected to increase to unsustainable levels of almost half of the total Federal Government expenditure by 2050¹. Investment in HMR is a proven approach for mitigating the escalating health and aged care costs^{4,6,9}.

- Dementia is a significant health problem in Australia, with associated health expenditure projected to outstrip that of any other health condition by the 2060s. Delaying the onset of dementia by 5 years through Australian HMR will result in estimated savings of \$67.5 billion by 2040⁴.
- Diabetes is Australia's largest growing chronic disease and its incidence is projected to increase by 436% in the period 2003-2033². Prevention or delay of vision loss associated with diabetes alone will save \$7.6 billion by 2025⁴.
- An Australian vaccine for Group A *Streptococcus* will provide health benefits valued at \$319 million per year, of which \$78.4 million will be realised by Indigenous Australians⁴.

The future health challenges facing Australia require a focus on utilising our resources more effectively to achieve the long-term goals of improving health, and alleviating the projected unsustainable health and aged care expenditure. The HMR sector has become increasingly aware of the necessity to engage consumer groups, as well as streamline processes for consumer participation. This provides unique opportunities to disseminate research outcomes via the consumer groups' donor, philanthropic, corporate and media networks.

The pipeline from basic HMR to realised health benefit can take a considerable time, usually 10 to 15 years. Accordingly, an increased injection of Federal Government funds into the novel "blue sky" thinking in basic HMR, which vitally underpins preventative and translational research, is essential for the immediate forthcoming rounds of Federal Government HMR investment. A major source of basic biomedical, clinical and population health research funding is the NHMRC, which provides proven exceptional returns on investment:

- Investment in NHMRC over the period 2000-2010 is not only projected to save \$966 million in direct and indirect costs to the health system but also has projected gains of \$6 billion linked to increased well-being⁹.
- Projected increased investment in NHMRC over the coming decade, to reach \$6.1 billion in 2022 has extrapolated health expenditure savings of \$25.9 billion over the next 50 years³. This is a conservative figure that does not include health expenditure savings linked to gains in well-being.

To ensure Australia's continued international competitiveness in HMR, it will be necessary to retain the best and brightest individuals from secondary schools and undergraduate courses into a HMR research career path that fosters long term support for both biomedical and clinical researchers in team building environments. This approach is critical to replace Australia's rapidly retiring generation of the HMR workforce, as well as improve the perception of a career in HMR.

- More than 6000 individuals in Australian HMR, aged >40 years in 2009, are expected to leave the workforce during 2009-2019¹⁰.
- In 2008, a survey of the Australian HMR workforce (379 individuals) revealed that most researchers (73%) had considered leaving active research, as a result of shortage of funding (91%), lack of career development opportunities (78%) and poor financial rewards (72%)¹¹.

1. Australian Government, The Treasury 2010. Australia to 2050: future challenges – The 2010 Intergenerational Report.

2. Goss J 2008. Projection of Australian Health care expenditure by disease, 2003 to 2033. Cat. No. HWE 43. Canberra: AIHW.

3. Deloitte Access Economics, 2012. Extrapolated returns on investment in NHMRC medical research. <http://www.asmr.org.au/Publications.html>

4. Access Economics, 2008. Exceptional Returns: The value of Investing in Health R&D in Australia II. <http://www.asmr.org.au/Publications.html>

9. Deloitte Access Economics, 2011. Returns on NHMRC funded Research and Development. <http://www.asmr.org.au/Publications.html>

10. Schofield DJ et al. 2011 A crisis in the making? Education, ageing populations and the future of the medical research workforce *Med.Edu.*45:200-7.

11. Kavallaris M et al. 2008 Perceptions in health and medical research careers: the Australian Society for Medical Research Workforce Survey. *MJA* 188:520-524

Academic HMR centres linking universities, research institutes, public health agencies and teaching hospitals should be a pivotal component of a Government vision for healthcare in Australia. This strategy has proven health and economic outcomes:

- Integrating prevention and acute health care services through Australian HMR, led to an 87% reduction in hospital readmissions for cardiac-related events, with substantial savings to the health care system¹².

An immediate increase in investment for Australian HMR, together with long-term structured support for our HMR workforce, will feed directly into effectively treating patients, building essential knowledge for developing future innovations, and protect our nation's future health and aged care affordability.

How can we optimize translation of HMR into both commercial and social outcomes?

A major source of Australian HMR funding ($\approx 26\%$) comes from the commercial sector⁴. Stimulating industry to further invest in HMR should therefore be a major goal for Government to achieve sustained and appropriate funding of the HMR sector.

- Tax incentives for industry and commercial partners, coupled with bio-innovation designed courses for postgraduated scientists and clinicians, similar to the oft-quoted Mayo Clinic and Stanford models^{13,14}, should be considered as an important approach to stimulate investment in HMR.
- Philanthropic investment plays an important part not only in building capacity but in securing greater investment in Australian HMR. We should look at systems overseas to encourage bequests, such as tax incentives for philanthropists.

Another strategy could be the leverage of industry (i.e. superannuation) funds through the NHMRC development grants, which are presently funded at relatively low levels. In 2011, 16 new development grants were awarded, representing 1% of total funding commitments¹⁵. Increasing development grant funding will further enhance the HMR workforce and strengthen intellectual property for stimulating greater industry involvement. Investment in NHMRC has a proven track record in generating commercial returns:

- Since 1970, the commercialised benefits of NHMRC R&D are \$6.1 billion⁴.
- The projected commercial returns from NHMRC R&D between 2000-2010 are \$1.45 billion for cardiovascular disease and cancer⁹.

Also important for the translation of health outcomes is the two-way dialogue between the biomedical scientist and clinician researcher. For this very important collaboration to be effective, we need to improve clinician researcher career paths, promote alliances between institutions, integrate academic/research/clinical centres and introduce more effective science research education to clinicians, and clinical education to scientists. The Federal Government must commit to long term incentive structures to encourage and promote both the development of biotechnology-based industries and the career paths of our nation's HMR workforce.

4. Access Economics, 2008. Exceptional Returns: The value of Investing in Health R&D in Australia II. <http://www.asmr.org.au/Publications.html>

9. Deloitte Access Economics, 2011. Returns on NHMRC funded Research and Development. <http://www.asmr.org.au/Publications.html>

12. Holst et al. 2001 Improved outcomes from a comprehensive management system for heart failure. *European Journal of Heart Failure*. 3:619-625

13. Page N 2007. The Making of a Licensing Legend: Stanford University's Office of Technology Licensing. <http://www.ipHandbook.org>

14. Dyrbye LN et al. 2011 A model for integration of formal knowledge and clinical experience: the advanced doctoring course at Mayo Medical School. *Acad. Med.* 86(9):1130-1136.

15. NHMRC Research Funding Facts Book 2011. In: <http://www.nhmrc.gov.au/guidelines/publications/nh154>

Summary

An effective HMR strategic plan to mitigate the projected future health and aged care challenges, by delivering high quality health care to all Australians in a sustainable and effective manner will require a multi-pronged approach as outlined above. There is a clear need for long-term Government incentive structures to encourage philanthropy and commercial investment in health R&D, as well as Federal Government investment maintained at a level commensurate with the health needs of the nation.

We look forward to working with the Federal Government's review panel to facilitate the strategic review of HMR in Australia in all its aspects – from the implementation of sustainable funding mechanisms through to preventative health.



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