

THE MRFF A RESEARCH AUSTRALIA PERSPECTIVE

TRANSLATING RESEARCH FOR A SUSTAINABLE
FUTURE

May 2016



ABOUT RESEARCH AUSTRALIA

Research Australia is an alliance of 160 members and supporters advocating for health and medical research in Australia independent of government. Research Australia's activities are funded by its members, donors and supporters from leading research organisations, academic institutions, philanthropy, community special interest groups, peak industry bodies, biotechnology and pharmaceutical companies, small businesses and corporate Australia. It reflects the views of its diverse membership and represents the interests of the broader community.

Research Australia's mission is to make health and medical research a higher priority for the nation. We have four goals that support this mission:

- A society that is well informed and values the benefits of health and medical research
- Greater investment in health and medical research from all sources
- Ensure Australia captures the benefits of health and medical research
- Promote Australia's global position in health and medical research.

The breadth and strength of the Research Australia alliance has been harnessed over many months to provide a perspective on the context and opportunities for the Medical Research Future Fund (MRFF). We hope these preliminary thoughts and commentary will be of use in the early deliberations of the Australian Government, the MRFF Advisory Panel and the NHMRC and reflects the advice and ideas of researchers from across Australia.

Research Australia will continue to develop and present advice supporting the work of the MRFF Advisory Panel to realise the potential of this important investment.



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THE MRFF A RESEARCH AUSTRALIA PERSPECTIVE

Translating Research for a Sustainable Future

EXECUTIVE SUMMARY

The MRFF is a once in a generation opportunity to significantly reshape the landscape of Australian medical research and innovation. Australia has world leading health and medical research (HMR) and a world-class health system, but too often they operate in isolation from each other rather than as one system with the aim of a healthier community. The MRFF provides the opportunity to bridge the gaps between the two, so that Australian medical research and innovation in partnership with health practitioners delivers the new practices, services and products needed to continue to improve the health, wellbeing and prosperity of Australians. Increasing participation in research by health providers in all disciplines and in all settings:

- Enables clinicians to more critically appraise and utilise new research outcomes
- Lifts and maintains the overall standard and quality of care
- Promotes the more effective and timely translation of research outcomes into practice.

The MRFF also provides the opportunity for enhanced economic prosperity through more effective commercialisation of Australian research as a driver of GDP.

The Strategy

Research Australia proposes two overarching Strategy goals to guide the MRFF through its formative years.

Health and Wellbeing: fund projects with clearly identified goals that will, if achieved, lead to better health and wellbeing through the translation of research into new clinical practices, health policy, products and services.

Economic Prosperity: fund programs that support the commercialisation of Australian HMR to grow GDP; help contain health expenditure through using evidence based practice to make the health system more efficient; and minimise the opportunity cost associated with the practice of research.

These goals are best achieved by adopting an approach to research, funding and translation that is elaborated below.

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| 1. The MRFF fund projects with clearly identified goals that are end user informed and lead to better health and wellbeing through new clinical practices, health policy, products and services. |
| 2. The MRFF should fund programs that support the innovation and commercialisation of Australian HMR, particularly in the early stages. |
| 3. The MRFF support research on improving health system efficiency and quality to achieve the best outcomes and value for expenditure on health care. |
| 4. The MRFF support programs with high relevance to the Australian community; in particular: (1) the translation of evidence into practice through the funding of research that identifies clear pathways to implementation; (2) including engagement with the end users in the health system, governments and the broader community; and (3) commercialisation of prospects that will be of value to Australia. |
| 5. That funding for research in disciplines such as health services research, public health research and health economics form an essential component of the MRFF Strategy. Research Australia is cognisant of the intersection of HMR with the other disciplines and recognises the value that occurs at this intersection. Assistive technology and diagnostics and health research with fundamental sciences should be appreciated and fostered. |
| 6. The MRFF should fund collaborative interdisciplinary research programs that include health systems, industry, the community and policymakers as partners. |
| 7. That where funding is provided in conjunction with another funding agency, the funding agreement must clearly stipulate how the costs of the project (direct and indirect) are to be met by the participants, with responsibility for each component of funding clearly allocated. |
| 8. The MRFF should be prepared to fund the indirect costs of research where doing so provides the best chance of success. |

The Priorities

Building to \$20 billion over several years the MRFF has enormous potential, however funding for the MRFF will be relatively small in the first few years and there is a risk that the MRFF will be overwhelmed by the weight of public expectations before it has the opportunity to grow to scale.

Thus, Research Australia's proposals below for the Funding Priorities are intended to utilise the MRFF's initial two years' funding in a disciplined and targeted manner to establish the framework for future health and commercial outcomes of relevance to Australia.

| |
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| 1. Engage researchers with expertise in health economics research to help design the evaluation framework to be used for the MRFF and other reforms. |
| 2. Create a Centre of Research Excellence for the evaluation of health outcomes, using health economics and other health services research to measure whether changes made in the health system have had the expected/desired effect. |
| 3. The MRFF provide funding to build capability in the preparation of health information datasets, their linkage and analysis, and promote availability to other researchers. |
| 4. Fund the creation of a new Institute of Health Services Research or alternatively a collaborative of existing research organisations (a virtual institute) to build research capacity, coordinate effort and disseminate new knowledge and practices. |
| 5. Leverage the recent COAG commitment to health reform to fund the active involvement of researchers in the design, delivery and evaluation of the COAG health reforms in conjunction with state and territory governments, eg. the recent MBS Review. |
| 6. Invite the four <i>NHMRC Advanced Health Research and Translation Centres</i> to nominate initiatives to deliver improved health outcomes that could be undertaken immediately and have the potential for rapid national implementation. |
| 7. Fund an HMR stream of Linkage Projects with a focus on proposals that commercialise research discoveries or directly improve the delivery of health care. |

INTRODUCTION

In considering the significant role the MRFF should play in Australia's future it is important to recognise that the MRFF does not exist in isolation. The Australian Government already provides substantial funding for HMR and a range of programs to support innovation in the broader economy. While it is recognised that the state and territory governments, philanthropy and the private sector make important contributions to supporting Australian HMR and medical innovation, these are not discussed in detail in this paper; rather the focus is on the Australian Government's investment and policy framework.

Importantly, the MRFF Advisory Board is required to ensure that the funding priorities it sets for the MRFF 'complement and enhance' funding provided for medical research and medical innovation from other sources. Reinforcing this stipulation, the Minister is required to undertake a review of the MRFF by mid-2023 to determine whether the financial assistance provided from the MRFF has '*complemented and enhanced other financial assistance provided by the Commonwealth for medical research and medical innovation, including through the National Health and Medical Research Council*'.¹

It is therefore clear that any consideration of what the MRFF should fund and how it will do so requires an appreciation of the financial assistance that already exists and how this could be complemented and enhanced. For this reason, this paper briefly gives an international perspective (Chapter 2), outlines the MRFF and examines the existing 'ecosystem' of policy direction and funding for HMR and for innovation (Chapter 3) before considering how and where the MRFF could make a unique contribution in both the long and shorter term. More details on the existing funding mechanisms can be found in **Appendix 2**.

This paper draws heavily on an extensive consultation process undertaken by Research Australia in the second half of 2015 with our broad membership and alliance partners, which included group discussions, a survey and individual interviews. Further detail on the consultation process is provided at **Appendix 3**.

Research Australia acknowledges the valuable contribution made by all the participants in the consultation. We also draw on the findings and recommendations of the Strategic Review of Health and Medical Research (McKeon Review) conducted in 2012. In many ways the concerns and solutions proposed by the McKeon Review are reflected in the objectives of the MRFF and, indeed, in its creation.

¹ *Medical Research Future Fund Act 2015*, sections 32E, 62

Research Australia's *10 Strategic Imperatives 2015-2025* also provided a useful framework for considering the future role of, and priorities for, the MRFF.²

10 Strategic Imperatives

| | |
|---|--|
| 1. A healthy and empowered community Greater community understanding and appreciation of HMR is key to a healthier and more empowered Australian community. | 6. World class research needs world class researchers Research Australia supports greater certainty, security and flexibility in research careers to improve retention and recruitment of researchers and boost research productivity. |
| 2. Encourage giving Donations are a vital source of research funding alongside private sector investment and governments, and are tangible evidence of the Australian community's support for HMR. | 7. Funding research Public funding is the foundation of health and medical research globally. If we are to continue to enjoy the social and economic benefits of HMR we need long term, stable and sustainable public funding mechanisms for HMR which adequately cover the direct and indirect costs of research and the provision of infrastructure. |
| 3. Research active health services deliver higher quality care HMR benefits the community most effectively when researchers work closely with healthcare providers. | 8. Encourage commercial investment in R&D Commercial investment in research helps to sustain the virtuous cycle of discoveries leading to improved health outcomes. |
| 4. Developing implementation science – turning evidence into action For the benefits of HMR discoveries to be realised, new practices and behaviours that are supported by research need to be adopted by practitioners and the community. A focus on implementation in the healthcare sector is required to ensure that evidence supported by research is adopted. | 9. A Strategic National Approach A considered, holistic national strategy is required if we are to make the most of our investments of money, intellect and effort. A strategy that recognises HMR's role in the healthcare and innovation systems and the broader economy, and is cognisant of Australia's role in HMR globally. |
| 5. Collaborating for success Collaboration makes researchers more productive and effective, improves research quality and ultimately leads to better health outcomes. | 10. Reduce red tape Research Australia supports action to improve the efficiency of the HMR sector by identifying, reforming and eradicating practices and procedures that are inefficient and/or ineffective. |

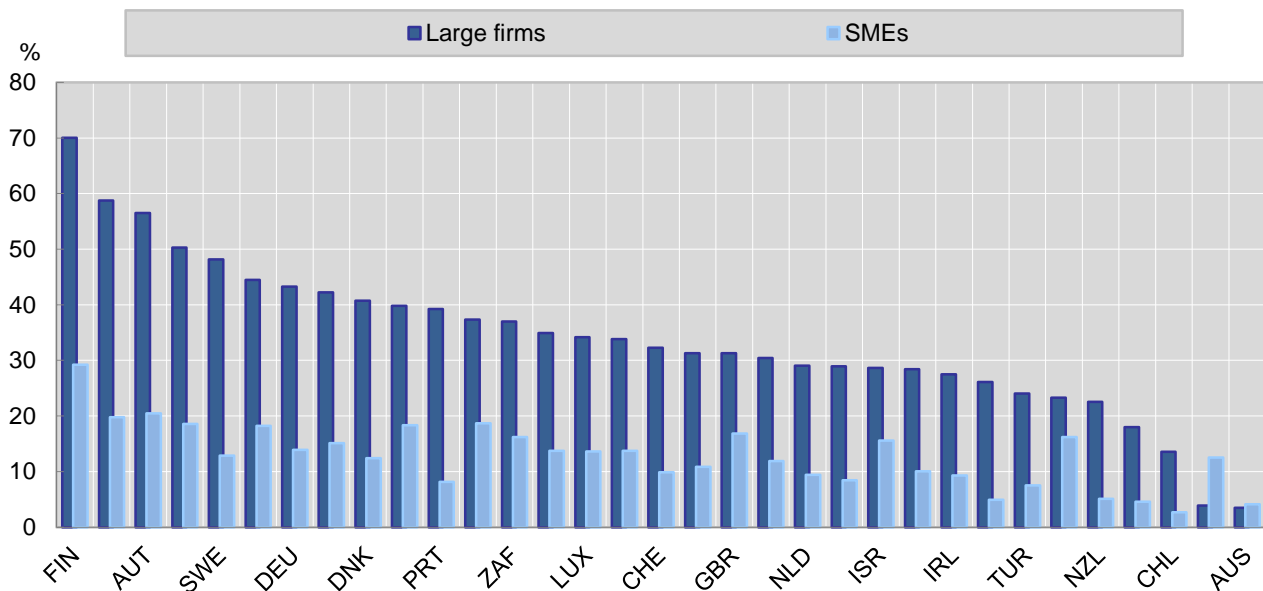
² <http://researchaustralia.org/reports/10-strategic-imperatives/>

CONTEXT AND INTERNATIONAL POSITION

Australia is not alone in seeking to transform its health and medical research sector and the impact it has on its citizens. While there is no perfect model, the UK and Canada are two that have made significant progress in reforming aspects of their HMR and its translation to better healthcare and commercial outcomes.

From a standalone research perspective, Australia's research ranks higher than the OECD average on most indicators of quality, placing us in the top ten. However, we score poorly on a range of measures of innovation when compared with other countries.³ Australia ranks last for business collaboration with researchers.⁴ Research Australia notes that while encouraging R&D has long been talked about it is now firmly on the national agenda.

Figure 1. Firms collaborating with Higher Education and publicly funded researchers⁵



To date, Australia has rewarded its publicly funded researchers for citation rates and publication in high quality journals and they have responded accordingly. Funding excellence without doubt remains an important metric and motivator, however the MRFF must focus on complementary criteria for articulating and rewarding success to address our poor rates of commercial and non-commercial translation of HMR. Addressing these deficiencies requires the strategic adoption of a range of strong measures designed to increase engagement with industry to boost invention and increase capacity in key areas such as health services research and health economics.

The UK identified a number of similar issues affecting their health and medical research landscape in the early 2000's. They found there was inadequate support for clinical research which was hindering national health and wealth; patients and the public would benefit from a more mutually advantageous collaboration

³ Australian Government, Department of Industry, Innovation and Science, Office of the Chief Economist, *Australian Innovation System Report*, Table A, Table A1 <http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Australian-Innovation-System.aspx>

⁴ Firms collaborating on innovation with higher education or public research institutions, by firm size, 2008-10, <http://dx.doi.org/10.1787/888932891359>

⁵ Ibid

between researchers and the health system; and health innovation was being hindered by the health system and the regulatory environment. Importantly, they decided their existing approach to funding research was not working and that a new model was required for sufficient and sustainable funding.⁶ This led to the creation of the National Institute for Health Research (NIHR) to focus on applied research in the health system.

The NIHR is a 'virtual' organisation, an overarching entity which collectively represents all publicly-funded research in the NHS. It is known today as 'the research arm of the NHS'. It has increased the volume of applied health research for the benefit of patients and the public, driven faster translation of basic science discoveries into tangible benefits for patients and the economy, and developed and supported the people who conduct and contribute to applied health research.⁷

Six years earlier, similar concerns about HMR in Canada had led to the creation of the Canadian Institutes of Health Research (CIHR); whereby each institute focuses on a specific health issue and funds research at all stages of the research continuum.

CIHR integrates research through an interdisciplinary structure made up of 13 "virtual" Institutes; not buildings or research centres, but networks of researchers brought together to focus on important health problems. Each Institute is dedicated to a specific area of focus, linking and supporting researchers pursuing common goals and each Institute embraces a range of research from fundamental biomedical and clinical research, to research on health systems, health services, the health of populations, societal and cultural dimensions of health and environmental influences on health.⁸

A review of the CIHR's first five years concluded that the CIHR quantifiably refocused and energised its HMR community through enabling and promoting collaboration and it had developed and facilitated a range of initiatives in health services research that hadn't previously existed.⁹

The CIHR and NIHR are tailored solutions to a broadly similar issue: how to improve the translation of HMR. Reflecting their own countries' existing research and healthcare systems, they have taken two very different approaches. While these cases are instructive and there may well be examples we can draw on, we need an Australian solution that reflects our specific research and health systems, works with our federated national structure, enhances our strengths and addresses our weaknesses. The MRFF provides the opportunity to do this. It is without doubt a significant turning point in our national approach to medical research and innovation.

Direct government support for health-related R&D in OECD countries was about 0.1% of GDP in 2014. In Australia it was 0.08%.¹⁰ The additional \$1 billion per annum expected to be delivered by the MRFF by 2020-21 will put Australia closer to the OECD average and more in the league of the UK (0.12%), Norway and Denmark (0.13%), but still behind the USA (0.20%).

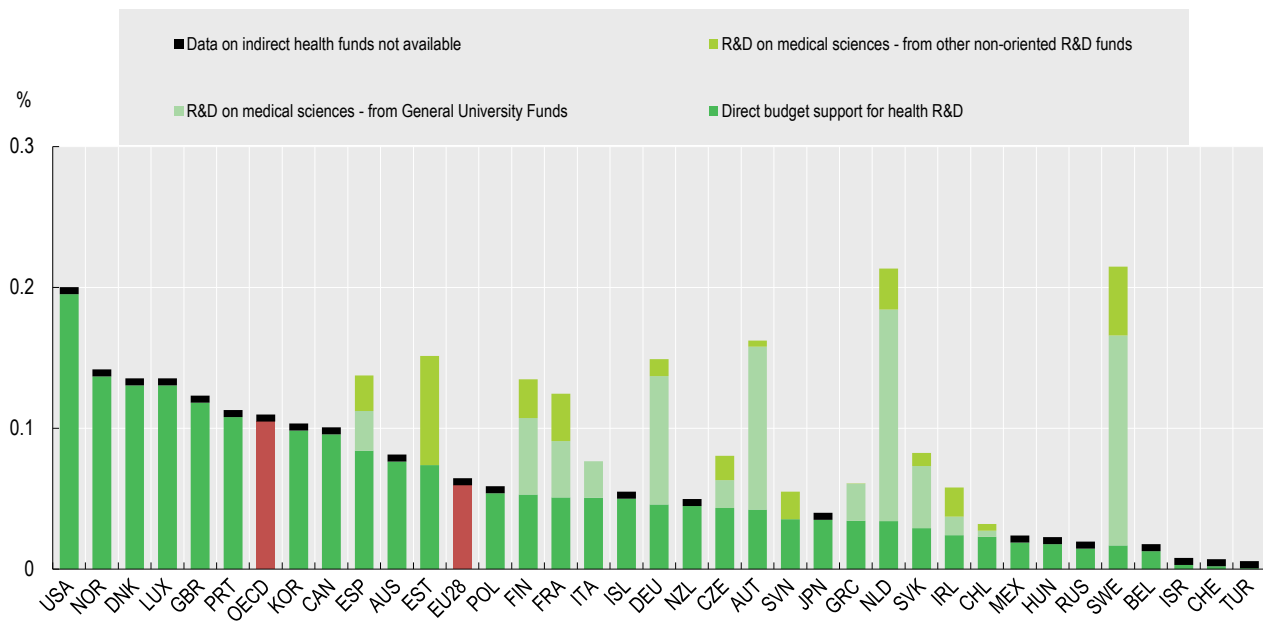
⁶ <http://www.nihr.ac.uk/about/history-of-the-nihr.htm>

⁷ <http://www.nihr.ac.uk>

⁸ <http://www.cihr-irsc.gc.ca/e/193.html>

⁹ CIHR, Year 5 International Review Panel Report 2000-2005, p.9

¹⁰ OECD, Science, Technology and Industry Scoreboard 2015, page 231; <http://dx.doi.org/10.1787/888933274912>

Figure 2. Government budget funding of health-related R&D, 2014¹¹¹¹ Ibid

OUTLINE OF MRFF

Created by the *Medical Research Future Fund Act 2015* (the Act), the MRFF came into existence in August 2015. The earnings on the capital will be used to fund *medical innovation* and *medical research*, both of which are defined by section 5 of the Act:

medical innovation includes:

- a) the application and commercialisation of medical research for the purpose of improving the health and wellbeing of Australians; and
- b) the translation of medical research into new or better ways of improving the health and wellbeing of Australians.

medical research includes research into health.

Section 10 of the Act specifies that grants can be made to:

- States and Territories via the COAG Reform Fund;
- corporate Commonwealth entities (e.g. the CSIRO); and
- universities, medical research institutes, and corporations.

The MRFF is forecast to disburse increasing amounts of funding over several years, commencing with \$61 million in 2016-17, \$122 million in 2017-18, \$215 million in 2018/19 and \$386 million in 2019-20.¹² The annual value of disbursements will continue to increase until it reaches around \$1 billion per year (depending on investment earnings on the capital).

Funding decisions will be made by the Health Minister in accordance with the five-year strategy (MRFF Strategy) and two yearly funding priorities (MRFF Funding Priorities), which are to be determined by the MRFF Advisory Board. Further detail about the role of the Advisory Board and its membership are provided in **Appendix 1**.

¹² Portfolio Budget Statements 2016-17 Budget Related Paper No. 1.10 Health Portfolio, Table 2.1.1, p.41

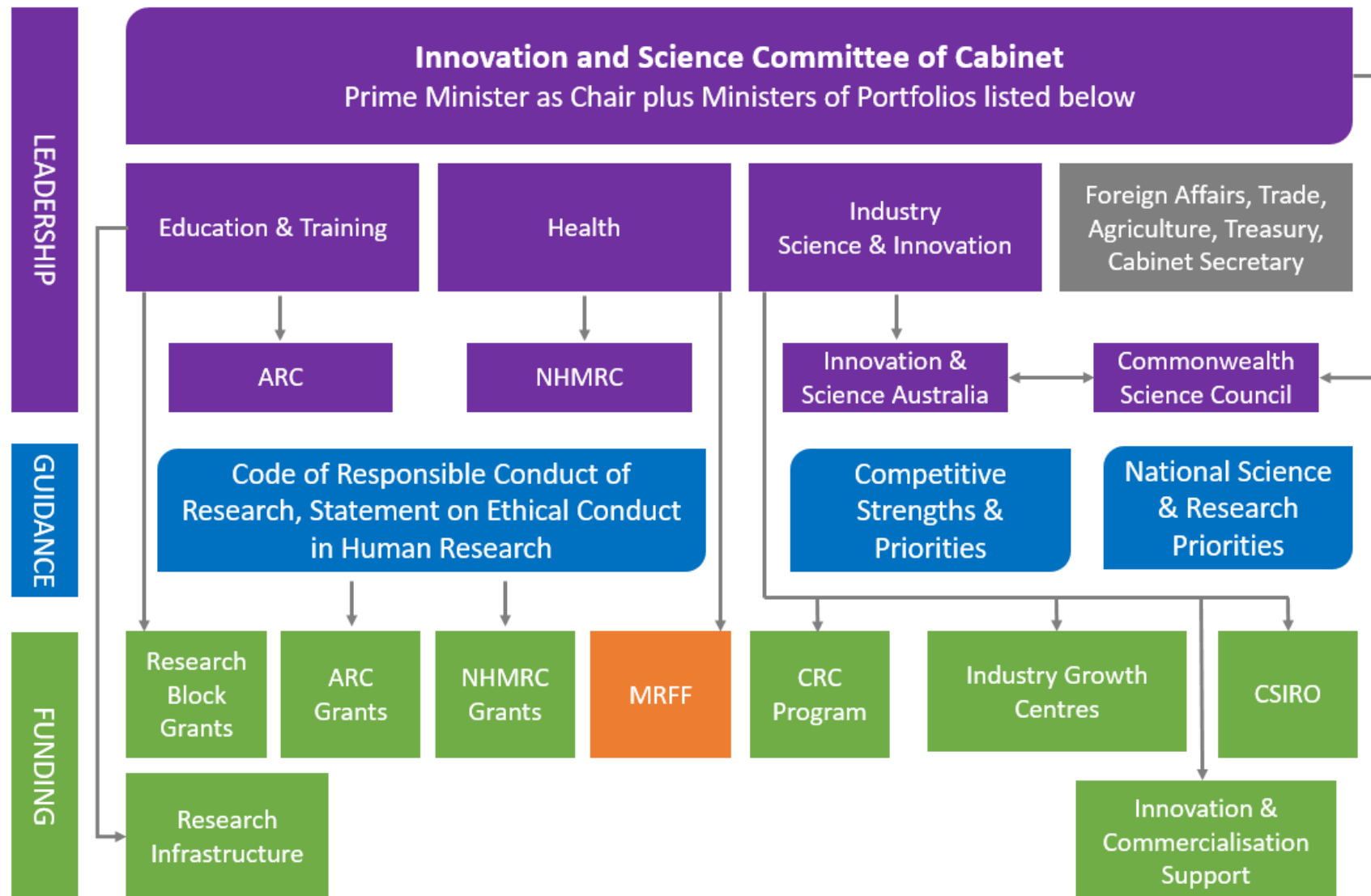
AUSTRALIAN GOVERNMENT POLICY AND INVESTMENT

This chapter places the MRFF in context in relation to the existing policy framework and funding environment for health and medical research and innovation. While the MRFF Act itself provides guidance about the factors to be considered in allocating funding such as the burden of disease, practical benefit and value to the Australian community, it is likely that the MRFF will be influenced by the direction being set for Australian science and innovation by the National Innovation and Science Agenda (NISA). It therefore important to consider the broader context within which the MRFF will operate.

It is worth noting that while this chapter deals almost exclusively with existing Commonwealth policies and programs, this is because the MRFF is, itself, an Australian Government fund. Research Australia acknowledges that state and territory governments, the private sector and philanthropy all make significant contributions to health and medical research in Australia. This contribution is recognised in the MRFF, which has the capacity to provide funding to state and territory governments through the Council of Australian Governments (COAG), to provide funding and investment to support private sector research and development, and to leverage philanthropy for HMR.

The policy framework for science and innovation is illustrated in Figure 3.

Figure 3. The Australian Government framework for science and innovation



Innovation and Science Committee of Cabinet

As part of NISA, the Prime Minister announced the establishment of the Innovation and Science Committee of Cabinet. Chaired by the Prime Minister, it includes ministers from all the key portfolios, including Health; Education and Training; and Industry, Innovation and Science. The committee will play a coordinating role to ensure a whole of government, cross-portfolio response to science and innovation.

Commonwealth Science Council

The Commonwealth Science Council provides advice to the Prime Minister on key science challenges. In addition to the Chief Scientist and the Ministers for Health; Education and Training; and Industry, Innovation and Science, its members are drawn from the senior ranks of science and business.

Chief Scientist

Australia's Chief Scientist provides high-level independent advice to the Prime Minister and other Ministers on matters relating to science, technology and innovation. The Chief Scientist is Dr Alan Finkel AO.

National Science and Research Priorities

The Government has published a set of Science and Research Priorities, and corresponding Practical Research Challenges, designed to 'increase investment in areas of immediate and critical importance to Australia and its place in the world'.

The Priorities and associated Practical Challenges were developed by the (then) Chief Scientist in consultation with researchers, industry leaders and government representatives. The Commonwealth Science Council considered the Priorities and recommended their adoption by the Government, and they were announced in May 2015.

The rationale for their existence is to ensure that appropriate levels of public funding are allocated to research that addresses the most immediate problems facing the nation. Health is one of the nine priorities.¹³

Innovation and Competitiveness - areas of competitive strength and strategic priority

The Industry Innovation and Competitiveness Agenda was announced on 14 October 2014. It identified five industry sectors of competitive strength and strategic priority that warranted targeted Australian Government support, one of which is medical technologies and pharmaceuticals.

While there is some overlap with the national research priorities, it is not complete. The Research Priorities reflect areas of research need in the national interest while the industry sectors are areas where Australia is considered to have a competitive advantage and the ability to generate prosperity.

The differences between the two are evident in the area of health. The Research Priority of health is focused on models of healthcare, emerging health issues, indigenous health and technologies to assist individuals to better manage their own care.¹⁴ The Medical Technologies and Pharmaceuticals Growth priority is focused on boosting the competitiveness of Australia's pharmaceutical and medical technologies industries with the

¹³ <http://www.science.gov.au/scienceGov/ScienceAndResearchPriorities/Pages/default.aspx>

¹⁴ <http://www.science.gov.au/scienceGov/ScienceAndResearchPriorities/Pages/Health.aspx>

aim of increasing exports and revenue. The former has a focus on health outcomes while the latter is focused on economic prosperity.

Innovation and Science Australia

Innovation Australia is being rebranded and reconstituted as Innovation and Science Australia (ISA), to provide strategic whole-of-government advice to the Government on all science, research and innovation matters in which the Government invests.

National Health and Medical Research Council

In addition to providing funding for research and training, the NHMRC is charged with raising the standard of health, fostering consistent national health standards and consideration of ethical issues relating to health.¹⁵

In developing the five year MRFF strategy, the Advisory Board is required to take into account the NHMRC's *'national strategy for medical research and public health research prepared for the purposes of paragraph 16(2)(c) of the National Health and Medical Research Council Act 1992...'*¹⁶ It is available on the NHMRC website.¹⁷

Investment

The Government's \$9.7 billion annual investment in research and development (R&D) is fragmented across 15 portfolios. Funding for HMR derives from a number of these portfolios and from various programs; some are HMR specific while others are more general.

The most readily identifiable Australian Government funding for HMR comes from the Department of Health and the Department of Education and Training. The bulk of this flows to universities and MRIs, and it makes up more than one third of all expenditure in Australia on health and medical research and development.

In 2015-16, the NHMRC is expected to provide \$846 million in funding for health and medical research.

The share of University Research Block Grant Funding related to HMR conducted by universities is the next largest component, at around \$679 million. From there the amounts get significantly smaller, with a contribution of around \$94 million from the Australian Research Council programs, \$89 million in tax subsidies from the R&D Tax Incentive, \$58 million in other support for research provided by the Department of Health and around \$35 million in health related work by the CSIRO.¹⁸ There are other elements of funding which are not included because the HMR related component cannot be specifically identified from available data. For example, the Department of Industry, Science and Innovation provides a range of programs that support R&D by Australian businesses, including those developing health related products and services.

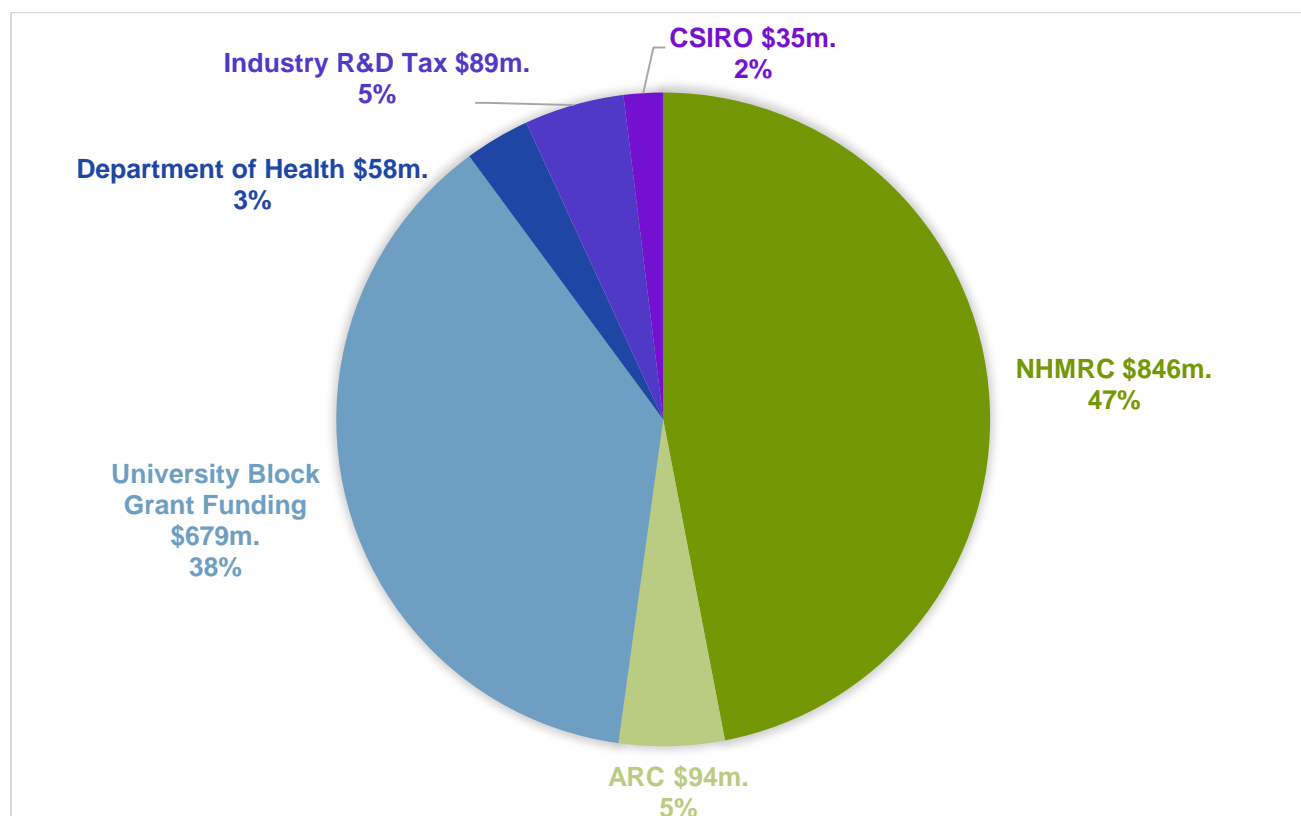
¹⁵ *National Health and Medical Research Council Act 1992*, section 3

¹⁶ *Medical Research Future Fund Act 2015*, section 32D (3)

¹⁷ <http://www.nhmrc.gov.au/guidelines-publications/nh168>

¹⁸ The source for the data is the Science, Research and Innovation (SRI) Budget Tables 2015-16 for the SEO of health. The Block Grant Funding is estimated to be 34% of the value of university block grants, based on ABS data showing that 34% of all Higher Education R&D is conducted in the SEO of health. The Australian Government's 2015-16 Science, Research and Innovation Budget Tables; Analysis of ABS data on Higher Education R&D expenditure by SEO reveals that the SEO of Health accounts for 34% of total higher education R&D expenditure. *Source: ABS 8111.0, Research and Experimental Development, Higher Education Organisations, Australia 2012, SEO Health (\$3,270,969,000) divided by total expenditure (\$9,609,736,000)*. Another component of funding which is not included in this table because it cannot be accurately estimated is the portion of funding received by universities from the Commonwealth Government which is used to fund research activities, including HMR. The Australian Bureau of Statistics reported that in 2012, General University Funds, including revenue from the Australian Government (but not including the categories in the Pie Chart 1) was \$5,340 million.

Pie Chart 1. Funding of HMR and medical innovation by the Australian Government Budget Estimates 2015-16¹⁹



The components identified in the above chart are explored below. **Further information is provided in Appendix 2.**

NHMRC Funding

The NHMRC is responsible for the operation of the Medical Research Endowment Account (MREA). The MREA receives allocations from the Australian Government as part of the Budget process and disbursements are made in instalments to grant recipients, usually over several years. The NHMRC provides funding programs for medical research and public health research; and research training.

By comparison, the MRFF's funds medical research and medical innovation. While *medical research* and *public health research* appear to be encompassed within the definition of medical research used in the MRFF Act, research training is not explicitly identified as an area for MRFF funding, and provides a potential point of difference between the MRFF and the existing NHMRC funding programs. The NHMRC provides a number of different fellowship schemes, and these tend to combine elements of further training and the provision of support to undertake research, blurring the lines between support for research and for research training. The total value of grants allocated for fellowships and other 'people support' in 2015 was \$172 million; approximately 22% of the value of all NHMRC grants.²⁰

Conversely, unlike the MRFF Act, there is no explicit provision for the NHMRC to fund medical innovation. Notwithstanding the absence of a specific inclusion, the NHMRC does provide funding for a range of

¹⁹ Ibid

²⁰ ²⁰ Australian Government, National Health and Medical Research Council, *2015 Outcomes by Scheme, Table 2*, <http://www.nhmrc.gov.au/grants-funding/outcomes-funding-rounds>, accessed 27 April 2016

activities which support the adoption or development of research findings. (The extent to which the NHMRC is able to fund activities which progress research towards translation has been a grey area in the past.)

Consequently, there is a significant degree of overlap in the responsibility of the MRFF and NHMRC for funding research with more discrete areas of responsibility for research training and innovation.

The definition of medical innovation in the MRFF Act makes it clear that the MRFF is to fund commercialisation activities as well as non-commercial translation.

Data provided by the NHMRC for the period from 2000 to 2014 shows that 6% of NHMRC funding was allocated to health services research in 2014, up from 1% in 2000 and 5% in 2010²¹. While this is a rapid increase, health services research is still only a small component of the total research funded by the NHMRC each year. Public health research received 14% of funding in 2014, up from 10% in 2000. Elsewhere, health services research and public health research are not normally funded by the ARC, and the focus of programs offered by Department of Industry, Science and Innovation is on innovation with commercial objectives.

Research Australia notes the NHMRC's Medical Research Endowment Account (MREA) funds some translation activities, both commercial and non-commercial, but these activities receive relatively little NHMRC funding. This should not be construed as a criticism of the NHMRC's funding programs; it funds world class and important research within increasingly restrained resources and increasing demand for research funding. It is, however, a recognition that the NHMRC cannot do it all, and the very existence of the MRFF is an acknowledgment of this fact by the Australian Government. It does not necessarily follow however, that the NHMRC should vacate the field of translational research, or that the MRFF should eschew all basic research.

Further detail and analysis of NHMRC funding is provided in Appendix 2.

Australian Research Council funding

The Australian Research Council (ARC) provides funding for research and research training to higher education institutions. Grants awarded for commencement in 2014-15 total \$663 million.²² While the ARC does not fund 'medical and dental research' as defined by its own funding rules, it funds a number of research areas which fall within a broad definition of health and medical research or are closely related to it, including bioengineering and research into the basic understanding of biological processes in humans and different stages of human development.²³ In 2015-16, ARC expenditure on health and medical research is estimated to be \$94 million.²⁴ **Further detail is provided in Appendix 2.**

University Block Grant funding

There are six Commonwealth Government grants programs that support research activities in the higher education sector. Funding for these programs is allocated based on criteria related to the conduct of research, such as the value of an institution's competitive research grants and the number of research students. In 2016, expenditure on these programs is expected to be \$1.81 billion.²⁵

²¹The percentages are derived from NHMRC data provided online at <https://www.nhmrc.gov.au/grants-funding/research-funding-statistics-and-data> found in the following table: `nhmrc_grants_summary_tables_2000_2014_150701` (last updated on 16 June 2015).

²² Australian Research Council, *Annual Report 2014-15*, Chapters 4 and 5.

²³ Refer to the ARC Medical Research Policy, effective 24 August 2015 at <http://www.arc.gov.au/arc-medical-research-policy>

²⁴The Australian Government's 2015-16 Science, Research and Innovation Budget Tables,

²⁵ Dept. of Education and Training website, 4 February 2016 at <https://www.education.gov.au/research-block-grants>
www.innovation.gov.au/Research/ResearchBlockGrants/Pages/default.aspx

Department of Health

In addition to funding for the NHMRC, the Department of Health funds a number of programs directly from its own budget; examples are the Cancer Clinical Trials, longitudinal studies of Men's and Women's Health, Drug and Alcohol Research and the National Acoustic Laboratories. In 2015-16, the estimated expenditure on these programs is \$58.2 million.²⁶

Industry R&D Tax Incentive

The Australian Government provides the R&D Tax Incentive to support companies undertaking research and development by providing additional tax incentives. In 2015-16 the total value of the R&D Tax Incentive is estimated to be \$2.9 billion, of which \$89 million relates to health R&D.²⁷

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

The CSIRO undertakes research across a wide range of areas, including health. Within health it covers a diverse range of fields from nutrition to the application of digital technologies. In 2015-16, CSIRO is estimated to spend \$35 million on health and medical research.²⁸ **Further detail is provided in Appendix 2.**

Other measures

The Australian Government provides a range of other programs to support research and/or commercial R&D, in particular from the Department of Industry, Science and Innovation. While some of the funding for these programs supports HMR and/or medical innovation, it is not possible to accurately quantify these amount and they have not been included in pie chart 1. **Further information about these programs is provided in Appendix 2.**

²⁶ The Australian Government's 2015-16 Science, Research and Innovation Budget Tables, Table 4, Department of Health and Ageing (excluding NHMRC)

²⁷ The Australian Government's 2015-16 Science, Research and Innovation Budget Tables, SEO of Health

²⁸ The Australian Government's 2015-16 Science, Research and Innovation Budget Tables, SEO of Health

GOALS AND INVESTMENT APPROACH

Having considered what is already in place in 2016, the MRFF Act, and the feedback received during Research Australia's consultation process, this section makes some suggestions to inform the initial five-year MRFF Strategy. These are followed by some specific suggestions for the MRFF Funding Priorities in the first two years, which Research Australia sees as an opportunity to enable the MRFF to gear up to support the longer term.

MRFF Strategic Goals

Research Australia suggests there are two fundamental goals for the MRFF Strategy with a focus on translating discovery and invention into better clinical practice, health policy, products and services, businesses and jobs. These are best achieved by adopting an approach to research, funding and translation that is underpinned by collaboration.

Health and Wellbeing

The MRFF should fund projects with clearly identified goals that are end user informed and lead to better health and wellbeing through new clinical practices, health policy, products and services.

This requires focused funding of medical research and innovation beyond the publication of findings to the development of new products and interventions which improve health. It embraces all the translation pathways to improved health, including better and safer treatments, the prevention of disease and injury, the promotion of wellbeing and the reform of healthcare systems.

The most pressing need is to improve the translation of research discoveries and innovation into better health outcomes through both commercial and non-commercial pathways. This involves:

- embedding research into health systems to better identify where research is needed;
- more resources to ensure research findings are adopted into practice and/or commercialised;
- greater capacity to measure the effect of the adoption of new practice and products ('did it perform as expected?');
- the adoption of new products and greater emphasis on advancing research further along the path to commercial development; and
- greater availability and utility of data for research purposes.

UK Biomedical Research Centres

The UK's Biomedical Research Centres (BRCs) are one example of an approach to improving the translation of research into clinical practice. There are currently 11 BRCs, formed through partnerships between the UK's health institutions and universities, to conduct translational research. Funded for five years with amounts ranging from £10 million to £112 million, each BRC conducts biomedical research across a range of clinical and research areas or in a specific clinical or research area.

Research themes include cancer, cardiovascular, dementia, endocrinology and metabolism, gastroenterology and hepatology, genetics and genomics, musculoskeletal, neuroscience, nutrition and lifestyle, ageing, paediatrics, respiratory disease, stroke, and surgical innovation.

The aims of NIHR BRCs are to:

- drive innovation in the prevention, diagnosis and treatment of ill-health;
- translate advances in biomedical research into benefits for patients
- provide a key component of the NHS contribution to the UK's international competitiveness by making the best Centres even better.²⁹

It can take between 10 and 20 years for proven treatments to be implemented routinely into healthcare.³⁰ It can take even longer for healthier behaviours to be widely adopted in the community. There are a number of actions we can take to accelerate this process. Identifying and adopting the most effective implementation strategies to change the practices of health service providers and the broader community can reduce this period. Participation in research by health providers in all disciplines and in all settings also promotes the more effective and timely translation of research outcomes into practice. The engagement of researchers in healthcare delivery helps direct research to the issues identified by clinicians and the community increasing the likelihood of rapid and effective translation.

Multidisciplinary and applied in nature, research to improve the delivery of health services is a good fit with the MRFF's emphasis on improving the health and wellbeing of Australians and the definition of medical innovation that emphasises 'new or better ways of improving the health and wellbeing of Australians.'

With the goal of a change in health practice or a new product to achieve better health outcomes, MRFF projects will necessarily have a translational element. Depending on the extent of existing research and knowledge in the area, a project may also need to involve both early and intermediate stage research.

For example, developing a cure or vaccine for a newly identified disease or emerging health threat may require starting in the laboratory to identify the cause and mechanisms of disease before progressing to developing a treatment and conducting clinical trials. In other cases, the research project may be able to start at a later stage in the research process, building on and synthesising existing research findings to develop a solution. To continue the example of a cure for an emerging disease, it may be about identifying and re-purposing an existing medication. Funding should be subject to appropriate governance and performance measures.

²⁹ <http://www.nihr.ac.uk/about/biomedical-research-centres.htm>

³⁰ Research Australia, *10 Strategic Imperatives 2015-2025*

Economic Prosperity

The MRFF has the potential to positively influence Australia's economic prosperity, which is itself a key component of better health and wellbeing, in a number of ways. As with the first theme, measures by the MRFF to support economic prosperity will necessarily have a translational element.

Increasing GDP

Research Australia suggests that the MRFF fund programs that specifically support the commercialisation of Australian HMR, particularly in the early stages.

Medical research and innovation is a powerful driver of GDP creation through research based creation of new products, technologies and industries, creating jobs and boosting exports.

Research and Development (R&D) within industry and investment from private equity and traditional capital markets play a vital role in the growth of medical research and innovation in Australia. Commercial investment in research helps to sustain the virtuous cycle of discoveries leading to improved health outcomes.³¹

The pharmaceutical, medical device and biotechnology sectors in Australia are already significant exporters of manufactured goods. Australia can build on this success to create a strong and vibrant advanced manufacturing sector, providing skilled employment and economic growth. The MRFF can play a key role in addressing the sector's challenges including leveraging access to early stage risk capital and/or funding to advance research findings to the next step beyond publication.

A similar approach by the NIHR through programs such as Invention for Innovation (i4i) has seen a substantial increase in intellectual property generation from commercialising research. In 2014-15:

- more than £41 million in intellectual assets was generated
- 114 licensing deals were conducted; and 111 patents were granted.³²

The NIHR Invention for Innovation (i4i) Program is a translational funding scheme that supports the preclinical and clinical development of innovative medical technologies. Awards under the i4i Program are intended to help bridge the 'valley of death' in early stage medical technology innovation, by supporting collaborative research and development from proof of concept stage through to clinical safety and efficacy evaluation of completed prototypes.

The proposed technology or intervention must address an existing or emerging healthcare need and must have a clear pathway towards commercialisation and NHS adoption. The expected output is an advanced or clinically validated prototype medical device, technology or intervention. The NIHR funds i4i projects lasting between one and three years. There are currently no funding limits on awards granted by the i4i Program. Projects can be funded up to 100% of eligible costs and are awarded funding based upon the scale and nature of the proposed research activity - within the program's annual budget.³³

³¹ Australian Government, Health and Medical Research Strategic Review, *The Virtuous Cycle - Working Together for Health and Medical Research*, 1998, PJ Wills

³² <http://www.nihr.ac.uk/about/nihr-at-10.htm>

³³ <http://www.nihr.ac.uk/funding/invention-for-innovation.htm>

Better value health expenditure

Research Australia suggests that the MRFF support research on improving health system efficiency and quality to achieve the best outcomes and value for expenditure on health care.

Expenditure on health care has increased in Australia from 6.5% of gross domestic product in 1989-90 to 9.7% of GDP in 2013-14 and the same trend has been evident in much of the developed world.³⁴ The rate of increase has been identified by successive Australian Governments as an important issue, with real concerns about Australia's ability to sustain the current health system in the future.

Waste in the Australian health system has been widely reported.³⁵ Over the last decade a number of significant reforms have been implemented and trialed across the Australian health system with a goal of delivering better efficiency, quality, outcomes and value for the national investment in health including: the introduction of efficient activity-based funding of public hospitals; Primary Health Networks; integrated care strategies; person-controlled electronic health records and other digital health initiatives; the MBS review; and a number of safety and quality initiatives.

Research Australia suggests the MRFF support programs with high relevance to the Australian community, in particular: 1) the translation of evidence into practice through the funding of research that identifies clear pathways to implementation; 2) including engagement with the end users in the health system, governments and the broader community; and 3) commercialisation of prospects that will be of value to Australia.

It is worth noting that Canada has recently announced a Strategy for Patient-Oriented Research (SPOR), supporting five new pan-Canadian research networks in chronic disease. These networks are intended to connect researchers, health professionals, policy makers and patients across the country to improve the health of Canadians living with chronic diseases. They will address research priorities identified by patients and accelerate the translation of research findings into patient care and health care policy. The focus areas of the research include diabetes, chronic pain, child disability, gastrointestinal disorders, and chronic kidney disease. Funding is being provided by the CIHR and its partners, including universities, hospitals, industry, health charities, and provincial agencies.³⁶

Research Australia suggests funding for research in disciplines such as health services research, public health research and health economics form an essential component of the MRFF Strategy. Research Australia is cognisant of the intersection of HMR with the other disciplines and recognises the value that occurs at this intersection. Assistive technology and diagnostics and health research with fundamental sciences should be appreciated and fostered.

Medical research and innovation provide the opportunity to improve the efficiency and productivity of our health system and its workforce. With health expenditure in Australia of \$150 billion per year, even small improvements in efficiency and productivity can provide significant dividends for both the broader economy and government budgets. Reducing the percentage of GDP required to fund healthcare provides the

³⁴ Australian Institute of Health and Welfare, 2016, 25 years of health expenditure in Australia 1989-90 to 2013-14. p.vi

³⁵ Swerissen, H., Duckett, S., and Wright, J., 2016, *Chronic failure in primary medical care*, Grattan Institute; Duckett, S., Breadon, P., Romanes, D. Fennessy, P., Nolan, J. 2015, *Questionable care: Stopping ineffective treatments*, Grattan Institute; Productivity Commission 2015, *Efficiency in Health*, Commission Research Paper, Canberra; Bennett C, Australian Government, National Health and Hospital Reform Commission, *A Healthier Future For All Australians – Final Report of the National Health and Hospitals Reform Commission* – June 2009

³⁶ <http://news.gc.ca/web/article-en.do?mthd=index&crtr.page=1&nid=1044399>

opportunity to reduce public expenditures and increase the amount of GDP available to promote economic growth.

A key priority in improving the efficiency and productivity of our health system is the translation of research findings into evidence based practice. This is because research can identify new practices that better support recovery from injury and illness (and current practices that are of little value or relatively less effective). New treatments support the delivery of better, safe and higher quality health care, leading to faster and more complete recoveries and fewer readmissions, which are key drivers of cost. By identifying practices that are ineffective or sub optimal research can reduce unnecessary expenditure on procedures, imaging and pathology. Research can also support the adoption of new processes and work practices which improve the efficiency with which healthcare is provided.

Outside our hospitals and clinics, research provides the opportunity to prevent illness, injury and death through the identification of behaviours that increase mortality and morbidity and the design of programs that modify these behaviours.

However, the potential for these savings can only be realised when the research is applied or put into practice in our hospitals, clinics and the community, embedding research in the health system.

Better value research

Publicly funded research, like all other expenditures, has an opportunity cost; money invested in research could otherwise be used for different purposes. **The opportunity cost of health and medical research can be minimised by making the most effective and efficient use of the funding provided for research.**

- Research proposals have clear and well-articulated intermediate and final objectives.
- Research is funded to deliver these objectives and is terminated in a timely manner when objectives are not met (using an industry methodology such as a milestone/stage gate approach).
- Research proposals have clearly identified pathways to translation and implementation.
- Research findings are disseminated and publication is fit for purpose, containing all the information needed for the findings to be applied and/or verified and the underlying data is made available.

A Collaborative Approach

The Strategic Goals of Health and Wellbeing and Economic Prosperity are best achieved by adopting an approach to discovery research, translation and funding that is underpinned by collaboration.

Success in collaboration will lead to the more effective use of our existing resources for faster and more impactful research which addresses the needs of the health system and the Australian population and which is translated more quickly, completely and effectively into new clinical practices, products, services and health policy.

Research Australia suggests the MRFF should fund collaborative interdisciplinary research programs that include health systems, industry, the community and policymakers as partners.

- Collaboration with other researchers, including across disciplines, makes them more productive and effective, improves research quality and ultimately leads to better health outcomes.
- International collaboration with leading institutions and global networks brings new opportunities and leads to better quality and more efficient research.
- Collaboration by funding bodies enables more resources to be brought to the task from within Australia and around the world, and promotes collaboration by researchers.

- Collaboration between researchers and health providers helps to frame research questions and directs research to the issues that need to be addressed to improve the quality of healthcare. It also provides opportunities for participation by the public and patients. Ultimately it embeds research in the health system and promotes the more effective and timely translation of research outcomes into practice.
- Collaboration with industry helps direct research towards commercially viable solutions to problems and enhances the likelihood of the commercialisation of new products and services.
- Collaboration and engagement with the community and policy makers can help research to better inform public policy and drive better health outcomes through public health measures.

Internationally, joint funding of such programs is common. Over the 10 years the NIHR has been in existence, nearly £3.5 billion of additional research investment from the Government, charities and the life sciences industry has been attracted through NIHR's centres and facilities for experimental medicine in the NHS, with a year on year increase in funding from industry and charities of at least 40%.³⁷ Similarly, in six years, the CIHR leveraged over \$730 million from other funding bodies.³⁸

The MRFF is ideally placed to take the lead role in forming 'syndicates' of funding bodies for research projects, and doing so has at least two distinct advantages. Engaging the participation of other agencies in funding projects has the benefit of enabling the MRFF to fund more projects. Even more importantly, if other agencies are actively involved in funding a project they are likely to be more committed to ensuring its success. This commitment can be critical where implementation of research findings requires changes in other organisations and systems. For example, in research to improve the treatment of heart failure, a state health department's participation in funding a project makes it more likely that the department will help secure the active participation of hospitals and in making any necessary changes to implement a new approach, such as providing funding for post discharge home visits by a specially trained allied health professional.

In other cases, the most appropriate collaborators will be from foreign governments and research organisations. Australia has a relatively small population and the best collaborators for any particular research area will often reside overseas; such collaboration can be facilitated by joint funding of projects with overseas agencies.

Research Australia suggests that, where funding is provided in conjunction with another funding agency, the funding agreement must clearly stipulate how the costs of the project (direct and indirect) are to be met by the participants, with responsibility for each component of funding clearly allocated. The MRFF has the capacity and expertise, through the resources of the Department of Health and elsewhere to provide the necessary levels of oversight and budgetary discipline to collaborative ventures.

Research Australia suggests that the MRFF should be prepared to fund the indirect costs of research where doing so provides the best chance of success.

As a matter of good practice, there should be absolute clarity about which activities are being funded and by whom, and the contribution that each party is making; no project should commence until all the necessary funding has been secured. This includes explicit recognition of both the direct and indirect costs and allocation of responsibility among the parties as part of the agreement. Leaving indirect costs out of funding

³⁷ <http://www.nihr.ac.uk/about/history-of-the-nihr.htm>

³⁸ <http://www.cihr-irsc.gc.ca/e/44603.html#img8>

agreements, particularly with large projects, risks jeopardising the quality and timely completion of the research project.

Two year priorities

This section extrapolates the elements proposed above for the Strategy to identify some specific MRFF Funding Priorities, with a particular focus on the first two years of MRFF funding. Research Australia is mindful that funding for the MRFF will be relatively small in the first few years, and there is a risk that the MRFF will be overwhelmed by the weight of public expectations before it has the opportunity to grow and mature. Thus, the proposals in this section are intended to utilise the MRFF's initial resources in a manner that provides a foundation for future growth of investment.

The funding available from the MRFF is forecast to be \$61 million for 2016-17 and \$122 million in 2017-18. With \$183 million available in the two-year period of the first Priorities, expectations about what can be delivered need to be realistic and pragmatic.

There should be an emphasis on providing funding for initiatives with low administration costs and short lead times that can be implemented quickly and cost effectively. It is also an opportunity to lay the foundation for programs able to effectively utilise the larger sums to follow in future years.

Research Australia suggests that the MRFF engage researchers with expertise in health economics research to help design the evaluation framework to be used for the MRFF.

Australia's capacity in health services and health economics research is under-funded, under-resourced and lacks cohesion. As the MRFF brings an increased focus on commercial and non-commercial translation of research, Australia is likely to face capacity constraints in key areas such as health economics, health services research and innovation capability as well as expertise in commercialisation/spin out opportunities. In reality this will involve developing the measures that will be used to evaluate both the opportunity and success, including an evaluation framework for the MRFF Program. At least some of this will need to be incorporated in the funding rules and agreements. The suggestion is not to create an expensive administrative burden however;

Research Australia suggests the creation of a Centre of Research Excellence for the evaluation of health outcomes. Its functions would be to:

- develop measures of success (eg. quicker, more complete recoveries, lower incidence of disease) for the translation of medical research and innovation;
- evaluate the likely impact and outcomes of proposed research activities;
- ensure an effective and consistent approach to evaluating the outcomes and success measures of completed projects; and
- support the ongoing evaluation of the MRFF as a whole.

Research Australia suggests that the COAG commitment to health reform provides the opportunity for the MRFF to provide funding to more actively involve researchers in the design, delivery and evaluation of the COAG health reforms.

The involvement of the state and territory governments in innovation in the health system is critical to success. At the December 2015 Council of Australian Governments meeting, the principle of a shared responsibility of the Commonwealth, state and territory governments for the planning and provision of healthcare was adopted. The group emphasised the need for a whole-of-governments approach to innovation if we are to transform the delivery of healthcare. Research Australia notes that there was no

recognition of the role research could play in the design, implementation and evaluation of the proposed reforms.

Including research in this way could be done in conjunction with state and territory governments. In a similar manner, the MRFF could support other Commonwealth Government health reforms currently underway, for example the Medicare Benefits Schedule (MBS) Review, the reform of primary health care to support patients with chronic and complex illness, and the Australian Digital Health Agency.

The McKeon Review proposed an Institute of Health Services Research as a means of building capacity, coordinating effort and disseminating new knowledge and practices.

Research Australia suggests that the MRFF fund the creation of a new Institute of Health Services Research or alternatively a collaborative of existing research organisations (a virtual institute) to undertake this program of work.

The state and territory governments should be actively recruited as partners to this program. Part of the function of the Institute could be to invite the submission of innovative approaches to healthcare by individual health providers that can be evaluated for their effectiveness and suitability for wider adoption. The Institute could work with the proposers to develop funding proposals to the MRFF to further develop and evaluate the approaches for broader implementation in the health system.

Such an institute helps address a critical capacity gap in health services research, however there is still a need for initiatives to translate research across the health system. The NHMRC has designated four *NHMRC Advanced Health Research and Translation Centres* following an extensive evaluation process.

Research Australia suggests the MRFF invite the four *NHMRC Advanced Health Research and Translation Centres* to nominate initiatives to deliver improved health outcomes which could be undertaken immediately and have the potential for rapid national implementation. Part of the role of the initiatives would be to promote engagement and help embed research in the health system.

Australia's health system is often 'flying blind' without access to the rich data that could be made available. Health system and health services researchers have long called for de-identified linkage of data sets that currently exist such as the MBS, PBS and public and private hospital databases. Data has become increasingly important to our understanding of health and disease. It can be used by researchers to identify new and improved ways of delivering health services and improving health outcomes, but there is currently a range of impediments to the use of health data sets in this way. In many cases, the barriers to the better use of data can be addressed with funding to facilitate the participation of disparate stakeholders in efforts to make data available for research and prepare appropriate datasets.

Research Australia suggests that the MRFF provide funding to build capability in the preparation of research oriented health information datasets, their linkage and subsequent analysis, preferably through shared infrastructure and resources available to research groups.

This will help build a new national framework for the collection, storage and use of data which recognises that:

- Data sets are a valuable and critically important national resource
- Data should be collected and stored in a manner which enables the use and linkage of de-identified data for research purposes
- Research is a legitimate purpose for which information can be collected, used and disclosed
- Access to data for appropriate research purposes should be facilitated by the owners/operators of data sets.

The Canadian Institute for Health Information (CIHI) was established in 1994 by agreement between the federal, provincial and territorial governments, to improve the “deplorable state of health information” in Canada. Working in partnership with federal, provincial and territorial ministries of health, the CHI has become the leading source of high-quality, unbiased, comparable information about the delivery of health care in Canada, the performance of our health systems and the factors that affect Canadians’ health. It identifies its core strengths as:

- Identifying health information needs and priorities;
- Coordinating and promoting standards and data quality;
- Developing and managing health system databases and registries;
- Developing comparable measures of health system performance;
- Conducting analyses in the areas of population health and health services; and
- Building capacity and conducting education sessions.³⁹

The ARC Linkage Program was raised in Research Australia’s consultations on the MRFF as an example of an effective model for funding research innovation which could be emulated by the MRFF. The role of the Linkage Program in promoting innovation and engagement between universities and industry was recognised in the NISA, with the announcement that from 1 July 2016 the Linkage Projects scheme will be open to continuous applications ‘and decisions will be fast-tracked’.⁴⁰

Research Australia suggests that funding from the MRFF be provided for an HMR stream of Linkage Projects.

Funding under the Program should be provided for proposals that commercialise research discoveries or directly improve the delivery of health care in the Australian health system. Options include:

- duplicating successful aspects of the Linkage Program in an **HMR specific program funded by the MRFF**, potentially administered by the NHMRC; and
- opening the ARC Linkage Program to HMR with expanded eligibility to include applications by MRIs and health services, and retaining administration with the ARC, with funding provided by the MRFF.

The ARC Linkage Program has been open to health and medical research in the past; the McKeon Review noted the (then) recent decision to close the ARC Linkage Program to HMR in its report in 2013, and recommended that access be restored.⁴¹

The objectives of the proposed Program align with the MRFF’s role in funding the application and commercialisation of medical research. This can become a centerpiece of the MRFF’s focus on medical innovation and partnerships between industry and the research community.

³⁹ Canadian Institute of Health Information, *Strategic Plan 2016-2021* p.8 <https://www.cihi.ca/en/strategicplan2016-2021-enweb.pdf>

⁴⁰ Australian Government, National Innovation and Science Agenda, *Welcome to the Ideas Boom*, December 2015, page 11

⁴¹ Australian Government, *Final Report of the Strategic Review of Health and Medical Research*, 2013, page 216

CONCLUSION

The MRFF presents a significant opportunity to increase and improve the conduct of HMR and medical innovation in Australia. It is incumbent on the Australian HMR community to actively engage in the process of developing the MRFF Strategy and MRFF Funding Priorities. The aim of this paper is to provide early strategic input into the role of the MRFF and its future, stimulate further discussion across a broad stakeholder group and encourage big picture thinking that has the power to reshape the national HMR landscape over a period of time and create pathways to opportunities not yet thought of.

Research Australia's suggested **Strategic Goals of Health and Wellbeing** and **Economic Prosperity** form the basis for a cogent strategy for the translation of medical research and innovation that makes the best use of the available funding. Promoting collaboration across universities, medical research institutes, hospitals and health services, funding bodies and industry will be key to the MRFF's success.

Research Australia recognises the two year Priorities cannot simply be seen as the short term solution to the existing pressures in the HMR sector. Early MRFF funding has to be used strategically to create the foundations for a successful and sustainable long term future for medical research and innovation for Australia. Undoubtedly the current conversation will extend beyond the MRFF itself; as the MRFF develops over the next decade it will influence the entire funding landscape for HMR and health innovation. In particular, the funding programs of the NHMRC and ARC will likely change over time to accommodate the MRFF. This change is inevitable and is to be welcomed; the existing funding programs are not static and have changed in the past in response to new developments in how and where research is undertaken, and to changing national priorities.

Research Australia acknowledges that while it is important to keep an eye on the horizon the immediate priority is to get the once in a generation opportunity the MRFF provides started in the right direction.

APPENDICES

APPENDIX 1

THE MRFF

Funding decisions will be made by the Health Minister in accordance with the five-year strategy (MRFF Strategy) and two yearly funding priorities (MRFF Funding Priorities), which are to be determined by the MRFF Advisory Board. Consisting of the CEO of the NHMRC and up to seven other appointees, the Board as a whole is required to have expertise in:

- medical research;
- policy relating to health systems;
- management or delivery of health services;
- medical innovation;
- financing and investment;
- commercialisation;
- philanthropy; and
- consumer issues relating to health.

The following appointments to the Advisory Board were announced on 4 April:

- **Professor Ian Frazer, AC (Chair)** Inaugural President of Australian Academy of Health and Medical Sciences and former Australian of the Year
- **Professor Anne Kelso** CEO of the NHMRC
- **Mr. Yasser El Ansary** CEO, Australian Private Equity and Venture Capital Association (AVCAL)
- **Professor Doug Hilton** Director, Walter and Eliza Hall Institute and President of AAMRI
- **Professor Peter Hoj** President and Vice Chancellor, University of Queensland
- **Dr. Deborah Rathjen** CEO, Bionomics and a Director of the Cancer Therapeutics CRC
- **Professor Karen Reynolds** Deputy Dean, School of Computer Science, Engineering & Mathematics, Flinders University and a Director of the Medical Device Research Institute
- **Jennifer Williams** Former CEO of the Red Cross Blood Service, Alfred Health and Austin Health and former Director Aged Care Community Health and Mental Health, Department of Health Victoria.

APPENDIX 2

EXISTING FUNDING PROGRAMS IN MORE DETAIL

This Appendix provides further detail about the NHMRC and ARC funding programs than is provided in the body of the paper. It also provides information about a number of other programs which provide funding for HMR and/or medical innovation as part of their broader purpose. Typically, it has not been possible to quantify the contribution each of these Programs makes to the funding of HMR and medical innovation.

NHMRC funding

The NHMRC provides funding programs for:

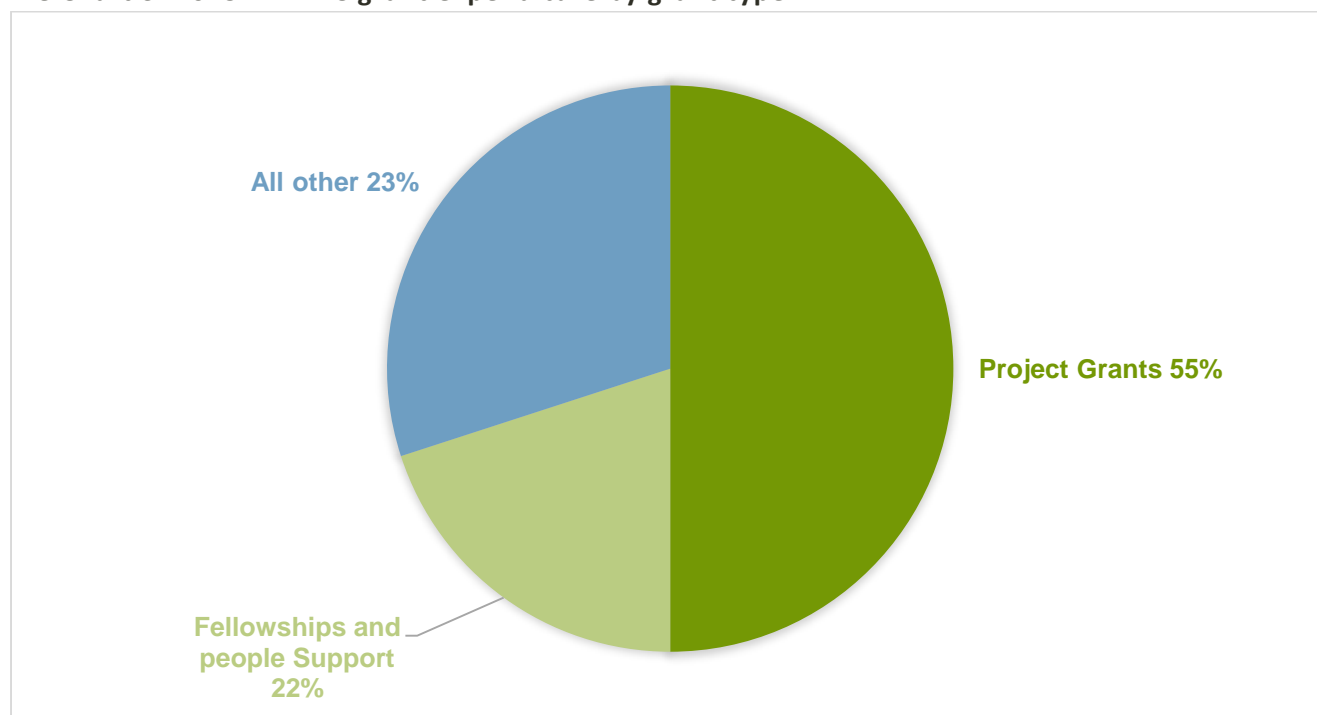
- medical research and public health research
- research training.

The NHMRC is responsible for the operation of the Medical Research Endowment Account (MREA). The MREA receives allocations from the Australian Government as part of the Budget process and disbursements are made in instalments to grant recipients, usually over several years.

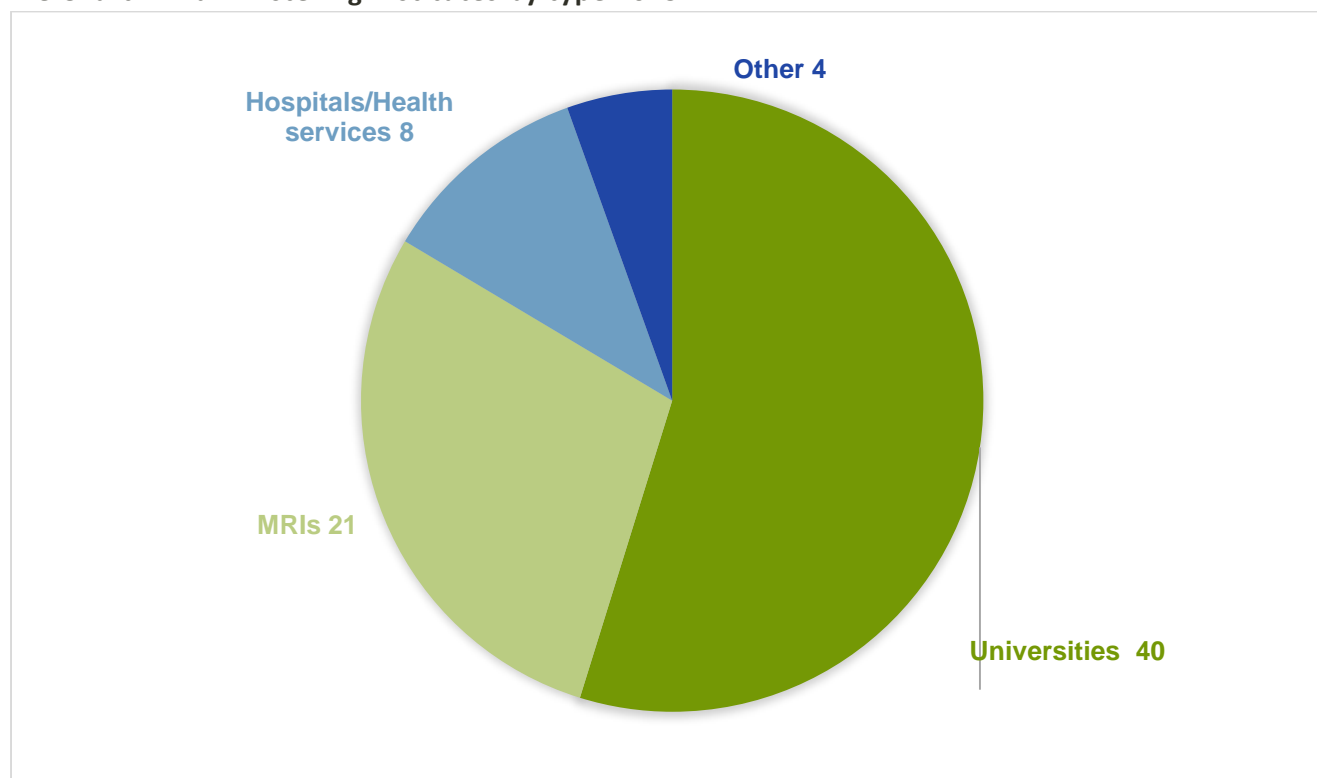
In 2015, the NHMRC announced 1034 grants in excess of \$763 million. 94% of the funding was allocated by a competitive grant process. Further detail is provided below.⁴²

Project grants provide funding to individuals or teams of researchers for specific research projects and account for half of all the grants made and 55% of the value of all grants. Fellowships provide support for individuals, including further research training. The total value of grants allocated for fellowships and other people support was \$172 million; approximately 22% of the value of all grants.

⁴² Adapted from NHMRC data,
https://www.nhmrc.gov.au/_files_nhmrc/file/grants/funding/2015/summary_of_results_2015_app_round_151109.xlsx

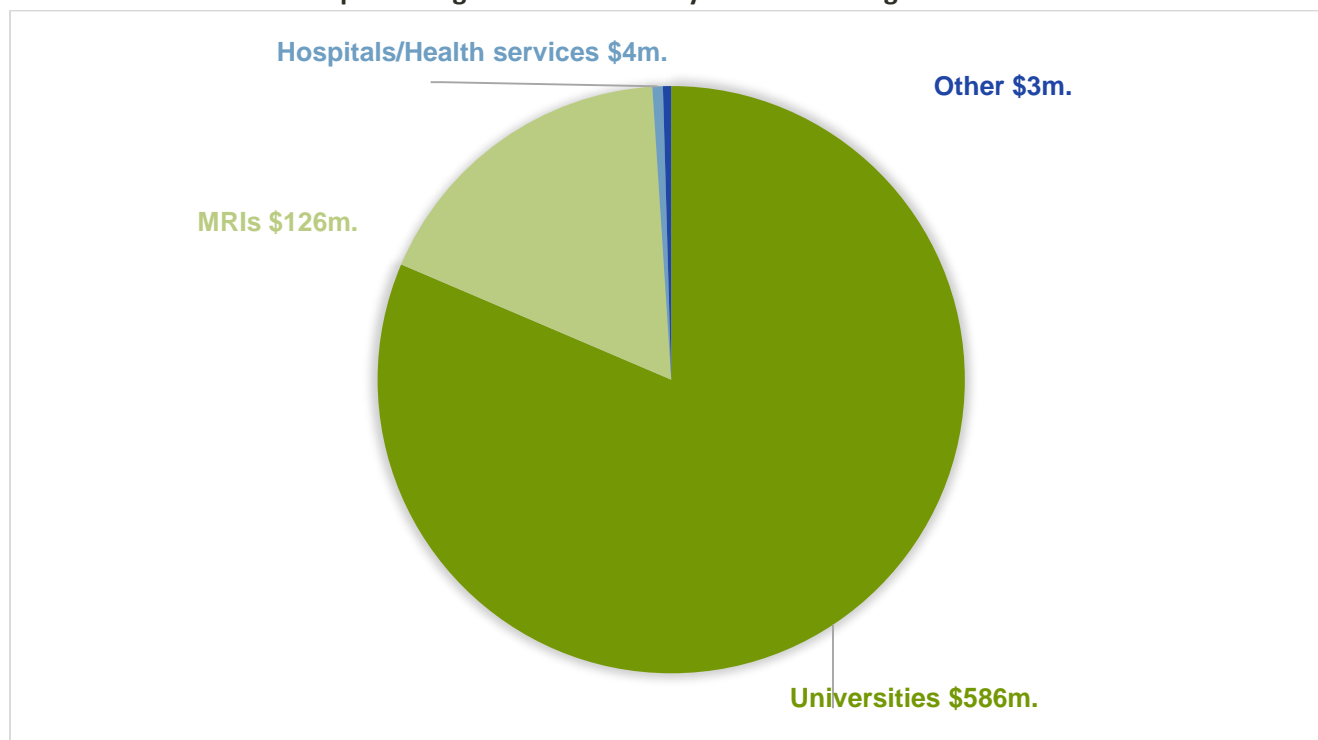
Pie Chart 3. 2015 NHMRC grant expenditure by grant type

While grants can be made to individuals or teams of researchers, the applicant must be affiliated with an 'Administering Institution'; most are universities, medical research institutes, hospitals or health services. In 2015, grants were made to 48 of the 73 Administering Institutions.

Pie Chart 4. Administering Institutes by type 2015

As illustrated below, the bulk of the grants are to universities and MRIs.

Pie Chart 5. NHMRC competitive grant outcomes by Administering Institution 2015



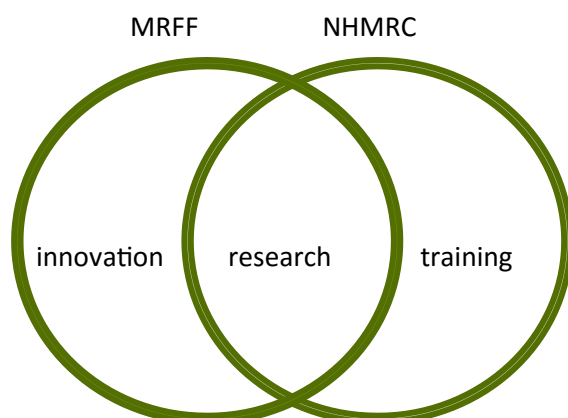
Research, training and innovation

Looking at the legislation which establishes the two different bodies provides some guidance as how the two are to be different. The NHMRC is required to fund 'Medical research' and 'Public health research', both of which appear to be encompassed within the definition of 'medical research' used in the MRFF Act. While funding for research training is also part of the NHMRC's role, research training is not explicitly recognised in the MRFF Act, and provides a potential point of difference between the MRFF and the existing NHMRC funding programs.

The NHMRC provides a number of different Fellowship schemes, and these tend to combine elements of further training and the provision of support to undertake research, blurring the lines between support for research and for research training. As noted above, the total value of grants allocated for fellowships and other 'people support' in 2015 was \$172 million; approximately 22% of the value of all NHMRC grants.

Conversely, unlike the MRFF Act, there is no explicit provision for the NHMRC to fund 'medical innovation'. Notwithstanding the absence of a specific inclusion, the NHMRC does provide funding for a range of activities which support the adoption or development of research findings. (The extent to which the NHMRC is able to fund activities which progress research towards translation has been an area of some confusion and frustration in the past.)

Consequently, there is a significant degree of overlap in the responsibility of the MRFF and NHMRC for funding research with more discrete areas of responsibility for research training and innovation.



Translation

In its 2014-15 Annual Report, the NHMRC provides the following commentary on translation of research. The figures in the right hand column are funding allocated in 2014-15, from the same document.⁴³

NHMRC funds a range of schemes that assist in the translation of research into practice.

These include:

| | |
|---|----------------------|
| Centres of Research Excellence (clinical, public health and health services research) | \$47,342,931 |
| Practitioner Fellowships, which support experienced clinical, public health and health services researchers to maintain a research career and a clinical career | \$8,010,206 |
| Fellowships for early career development, which have a special emphasis on clinical, public health and health services research and bioinformatics | \$39,370,614 |
| Partnerships for Better Health initiatives | \$9,748,304 |
| Translating Research into Practice Fellowships | \$1,729,110 |
| Development Grants. ⁴⁴ | \$15,178,566 |
| Total Funding 2014-15: | \$121,379,731 |

The total of \$121 million is a likely overestimate of the value of funding provided to support the translation of research as it includes the value of all Early Career Fellowships while only a portion of these will be for translational researchers, but it is not possible to accurately estimate this proportion from the publicly available data. Even so, the total of \$121 million represents approximately 15% of the \$826 million of funding allocated by the NHMRC in 2014-15.

⁴³ Annual Report of the National Health and Medical Research Council 2014–2015, pages 22-23

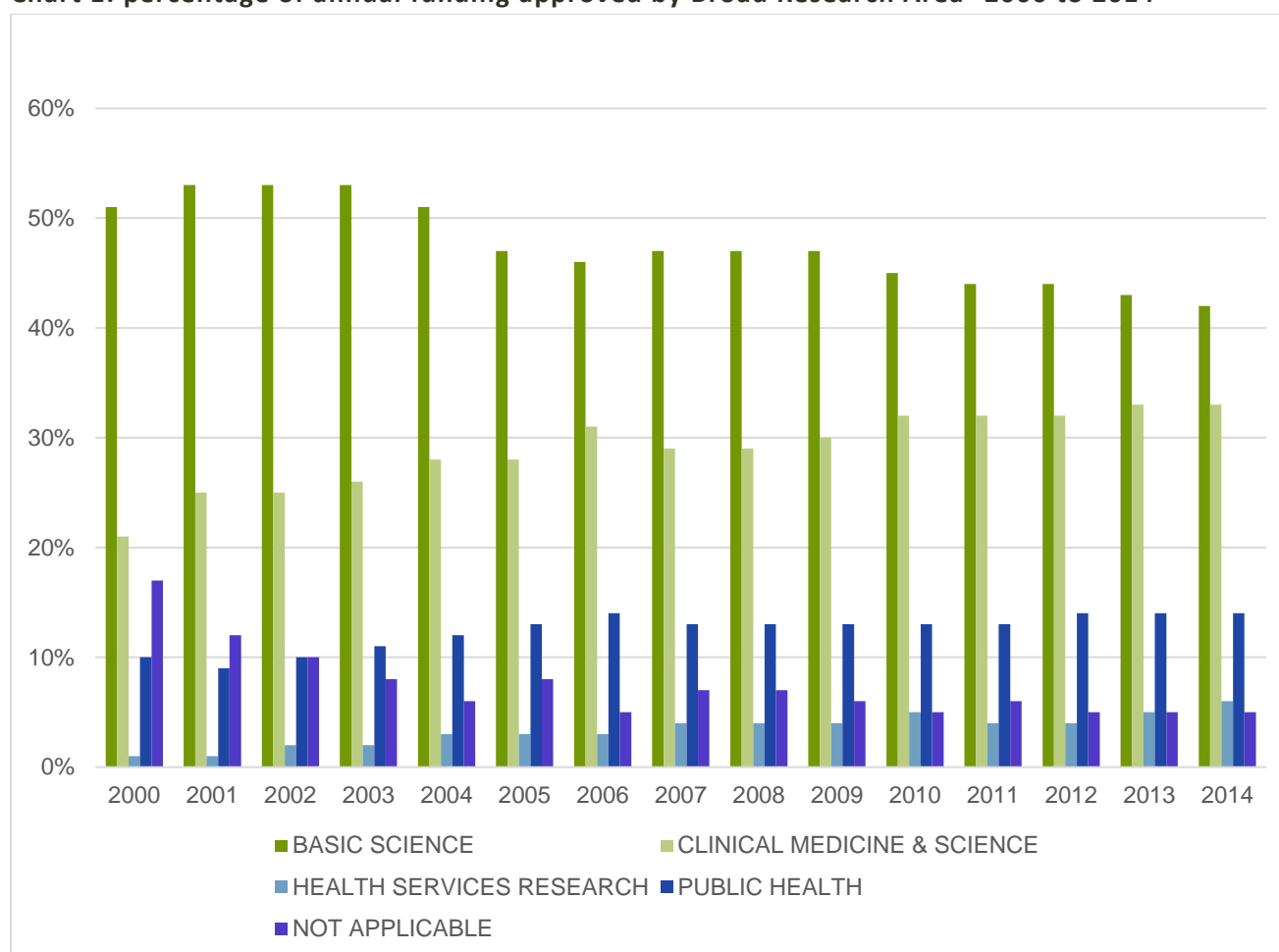
⁴⁴ Annual Report of the National Health and Medical Research Council 2014–2015, page 59

\$49 million of this amount is funding for Fellowships; if this amount is excluded on the basis that it is for research training rather than research, the NHMRC allocated funding of \$72 million in 2014-15 to research translation, which is 10% of the value of all competitive grants.

Funding by broad research area

Another approach is to look at funding allocations by 'Broad Research Area' (BRA). The below table provides a breakdown of NHMRC funding allocated each year from 2000 to 2014 based on the Broad Research Area.⁴⁵

Chart 1. percentage of annual funding approved by Broad Research Area- 2000 to 2014



Note: 'Not Applicable' includes Equipment Grants and Independent Medical Research Institute Infrastructure funding, and any other grants for which applications are not required, plus Block Funding grants where multiple allocations may be appropriate but are not available.

The chart shows that over the period from 2000 to 2014 the percentage of funding categorised as 'Basic Science' has declined while the allocations to the other categories have increased. However, there are some difficulties with using the BRA categories to understand the proportion of NHMRC funding which could potentially be characterised as 'medical innovation' as defined in the MRFF Act. While 'Basic Science' is relatively easy to understand and both 'Health Services Research' and 'Public Health' are translational in nature, 'Clinical Medicine and Science' is more difficult to assign to a single category. This perhaps reflects

⁴⁵ The percentages are derived from NHMRC data provided online at <https://www.nhmrc.gov.au/grants-funding/research-funding-statistics-and-data> in the table nhmrc_grants_summary_tables_2000_2014_150701 (last updated on 16 June 2015)

the fact that in practice there is no clear delineation between ‘basic’ and ‘applied’ research or between basic and translational research.

Health services research and public health research

Chart 1 above shows that 6% of NHMRC funding was allocated to Health Services Research in 2014, up from 1% in 2000 and 5% in 2010. While this is a rapid increase, health services research is still only a small component of the total research funded by the NHMRC each year. Public Health Research received 14% of funding in 2014, up from 10% in 2000. Elsewhere, Health Services Research and Public Health Research are not normally funded by the ARC, and the focus of programs offered by the Department of Industry, Science and Innovation is on innovation with commercial objectives.

Development Grants

Approximately \$15 million was allocated for NHMRC Development Grants in 2014-15.⁴⁶

‘The Development Grants scheme provides financial support to individual researchers and/or research teams to undertake health and medical research within Australia at the proof of principle or pre-seed stage that specifically drives towards a commercial outcome within a five-year timeframe.’⁴⁷

While success rates for Development Grants are typically higher than for other project grants and the NHMRC’s own review in 2012 concluded the program was very effective, Development Grants have been subject to several criticisms in the past including that the Program is too small and that individuals grants are too small and too restricted in scope – i.e. they do not enable research to be progressed far enough to attract commercial interest or support.⁴⁸ Partly as a response to the latter criticism, with effect from 2016 the involvement of an industry/commercial partner is mandatory.⁴⁹

Australian Research Council funding

The Australian Research Council (ARC) provides funding for research and research training to higher education institutions. Grants awarded for commencement in 2014-15 total \$663 million.⁵⁰

While the ARC does not fund ‘medical and dental research’ as defined by its own funding rules, it funds a number of research areas which fall within a broad definition of health and medical research or are closely related to it, including bioengineering and research into the basic understanding of biological processes in humans and different stages of human development.⁵¹

An analysis by Research Australia of completed ARC National Competitive Grant Projects since its inception in 2001 to 2012 suggested that on a conservative estimate, at least 10% of ARC project grants in that period were related to HMR. This includes a range of projects from medical device engineering to health economics. The Government has more recently redirected \$103 million of ARC funding over four years to

⁴⁶ Adapted from NHMRC data,

https://www.nhmrc.gov.au/_files_nhmrc/file/grants/funding/2015/summary_of_results_2015_app_round_151109.xlsx

⁴⁷ <https://www.nhmrc.gov.au/grants-funding/apply-funding/development-grants>

⁴⁸ Australian Government, National Health and Medical Research Council, *Evaluation of the Development Grants Scheme, Final Report April 2012*

⁴⁹ Australian Government, National Health and Medical Research Council, Section 5.2 of the 2016 NHMRC Funding Rules

⁵⁰ Australian Research Council Annual Report 2014-15, Chapters 4 and 5.

⁵¹ Refer to the ARC Medical Research Policy, effective 24 August 2015 at <http://www.arc.gov.au/arc-medical-research-policy>

health and medical research in diabetes, dementia and tropical diseases. In 2015-16, ARC expenditure on health and medical research is estimated to be \$94 million.⁵²

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

The CSIRO undertakes research across a wide range of areas, including health. Within health it covers a diverse range of fields from nutrition to the application of digital technologies. CSIRO expenditure on health is estimated to be \$35 million in 2015-16.⁵³

As part of the National Innovation and Science Agenda (NISA) launch the Australian Government announced that it was:

'supporting commercialisation of research from the (CSIRO), other research organisations and universities through an early stage innovation fund.

The CSIRO Innovation Fund will have two parts:

- an early stage innovation fund of \$200 million to support co-investment in new spin-off and startup companies, products and services created by Australian research institutions...
- a \$20 million expansion of CSIRO's Accelerator Program to include other publicly funded research organisations to more rapidly prepare their research for commercial adoption.⁵⁴

Department of Industry, Science and Innovation

The Department of Industry, Science and Innovation provides a number of funding programs designed to support Australian scientific research and foster innovation by Australian industry. These are programs with a broad remit across all science and innovation; while as part of this remit these programs support health and medical research and development it is often not possible to quantify this amount with any accuracy.

Following a review, the Government has implemented a number of new programs, including the *Entrepreneurs Programs, Commercialising Ideas and Research Connections*. In 2015-16, Commonwealth expenditure on these programs is estimated to be \$38.4 million.⁵⁵ While these programs are relatively new and it is difficult to assess the extent to which they will be directed to supporting medical research and medical innovation, one of the programs they have replaced- *Commercialisation Australia*- provides some guidance. As at 10 October 2013, *Commercialisation Australia* had accepted a total of 469 participants with grant support of \$198.5 million.⁵⁶ 101 of the grant recipients' products (21%) were in the 'health and medical' market.

Industry Growth Centres

The Australian Government has identified five areas of competitive advantage which it is seeking to support by establishing Industry Growth Centres to co-ordinate the transfer of knowledge and enhance innovation. One of these Industry Growth Centres is focused on Medical Technologies and Pharmaceuticals, and MTP

⁵²The Australian Government's 2015-16 Science, Research and Innovation Budget Tables,

⁵³ Science, Research and Innovation (SRI) Budget Tables 2015-16 for the SEO of health.

⁵⁴ National innovation and Science Agenda, CSIRO Innovation Fund Factsheet, December 2015, www.innovation.gov.au

⁵⁵ The Australian Government's 2015-16 Science, Research and Innovation Budget Tables, Table 4

⁵⁶ Commercialisation Australia website, 20 Nov, 2013,

<http://www.commercialisationaustralia.gov.au/OurParticipants/Pages/default.aspx>

Connect was established late last year. In 2015-16, Government expenditure on the Industry Growth Centres Program is estimated to be \$19 million.⁵⁷

Co-operative Research Centres

The Australian Government provides funding to support the establishment and operation of Co-operative Research Centres (CRCs). Ten of the existing 33 CRCs are health related.⁵⁸ In 2015-16, Commonwealth expenditure on the CRC Program is estimated to be \$146.7 million.⁵⁹

A funding round for new CRCs has been announced, and applications closed in early 2016. The rules applying to this funding round require applications to be assessed on merit and then in accordance with 'Government Priorities' (the Science and Research Priorities, and the priorities identified under the Industry Growth Centres initiative.). One of the nine Science and Research Priorities is Health and one of the five Industry Knowledge Priorities is Medical Technology and Pharmaceuticals, suggesting that the CRC Program is likely to remain relevant to HMR in the future.

Biomedical Translational Fund

As part of the National Innovation and Science Agenda (NISA) announced in December 2015, the Australian Government is establishing the Biomedical Translational Fund (BTF) to invest in promising biomedical discoveries and assist in their commercialisation.

The Government will commit \$250 million in capital for investment in late stage biomedical commercialisation opportunities, with \$125 million made available in each of 2015-16 and 2016-17. Fund managers will be selected through a competitive process and will bring at least matching funding from the private sector for investment.⁶⁰

The funds will be invested in later stage biotech companies whose projects have already moved beyond proof of concept and are ready for clinical trials. Investments are anticipated to be between \$5 million and \$20 million per project.⁶¹

While it may appear as if the BTF is competing with the MRFF it is an interim measure, with no funding committed beyond 2016-17. It is designed to allow significant funding to be directed to commercialisation opportunities while the MRFF is still building its capital base. In the longer term the MRFF is expected to take over the responsibility for funding this activity.

⁵⁷ The Australian Government's 2015-16 Science, Research and Innovation Budget Tables, Table 4

⁵⁸ CRC Program - CRC Directory (2015-16)

⁵⁹ The Australian Government's 2015-16 Science, Research and Innovation Budget Tables, Table 4

⁶⁰ National innovation and Science Agenda, Biomedical Translation Fund Factsheet, December 2015, www.innovation.gov.au

⁶¹ The Australian, 8 February 2016, interview with Mr. Bill Ferris AC, "*Biomed Fund set to turn a buck*"

APPENDIX 3

RESEARCH AUSTRALIA'S CONSULTATION WITH MEMBERS AND ALLIANCE PARTNERS

Research Australia engaged Health Consult Pty Ltd to assist the consultation process that consisted of three components.

Facilitated Discussion Forums were held in Sydney, Melbourne, Brisbane and Adelaide at a nominated member organisation between 28th July and 6th August 2015. Places were generally limited to one senior representative from each member organisation.

After the Forum consultations were completed, member contacts were invited to complete an online survey. The survey opened on 24 August and closed on 14 September.

In total, there were 298 Online Member Survey responses received. However, only 178 respondents had completed the Survey as 120 (40%) dropped out of the after completing the first question.

Table 1.3. Number of members involved in national consultation process by organisation grouping

| Type of member organisation represented | Survey | | Forum* | | Total ** | |
|---|------------|-------------|-----------|-------------|------------|-------------|
| | Count | % | Count | % | Count | % |
| University | 111 | 62% | 17 | 33% | 128 | 56% |
| Medical Research Institute | 35 | 20% | 9 | 17% | 44 | 19% |
| Consumer Health/ Philanthropy | 7 | 4% | 10 | 19% | 17 | 7% |
| Professional/ Industry Association/ Peak Body | 7 | 4% | 8 | 15% | 15 | 7% |
| Health Service/ Government | 12 | 7% | 2 | 4% | 14 | 6% |
| Corporate/ Biotechnology/ Pharmaceutical | 6 | 3% | 6 | 12% | 12 | 5% |
| Grand Total | 178 | 100% | 52 | 100% | 230 | 100% |

* Excludes facilitators and Research Australia staff. ** A few members may have attended the Forum and also responded to the Survey.

After the survey was completed, some supplementary interviews were conducted by phone, to gain further information in specific areas and to ensure that all industry sectors were represented. Nine interviews were conducted between 1 December and 14 December 2015. While a script was used, the respondents were not restricted in the responses they could provide.

For further information about the consultation please contact Research Australia.

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