

REVIEW TO STRENGTHEN INDEPENDENT MEDICAL RESEARCH INSTITUTES

The Review Panel is seeking written submissions to inform the review of independent Medical Research Institutes. Submissions are particularly welcome from independent and other medical research institutes, universities, state and territory governments, hospitals, clinical researchers, health professionals and private contributors.

*Discussion
Paper*

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health care

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education

research

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Introduction

On 29 October 2014, the then Commonwealth Minister for Health, the Hon Peter Dutton MP, announced a review of independent Medical Research Institutes (iMRIs). The Panel's Terms of Reference are to:

1. Review the major types of business models used by Australian iMRIs, including sources and application of funds, capital and asset models, corporate and research infrastructure platforms, translational impact and **make recommendations for improved efficiency**.
2. Considering iMRIs' existing research effort, review their research links, alliances and partnerships, identify gaps and potential synergies, and **make recommendations for improved collaboration** both within and outside the research sector (including with public and private hospitals, other clinical settings, universities, pharmaceutical and biotechnology companies, private equity, philanthropic bodies).

On 18 November 2014, the Review Panel released an Issues Paper and Business Models template as part of the review's consultation strategy. Submissions were invited from independent and other medical research institutes, universities, state and territory governments, hospitals, clinical researchers, health professionals and private contributors.

The aim of this Discussion Paper is to generate critical discussion about iMRIs by presenting the Panel's preliminary views on potential options to increase the long-term sustainability, institutional efficiency, collaboration and translational impact of iMRIs.

Stakeholder guide to providing written submissions

The Review Panel invites supplementary submissions in response to its preliminary views expressed in this Discussion Paper on the key themes of efficiency, collaboration and translational impact. Written submissions to inform the review need not repeat information already provided in response to the Issues Paper. To facilitate the Panel's consideration of your submission you are invited to provide a concise Executive Summary. Submissions should be sent to the Independent Medical Research Institute Review Secretariat electronically at iMRI.review@health.gov.au.

Submissions close **Midnight Sunday 22 February 2015**, Australian Eastern Daylight Time.

Confidentiality of submissions

All information (including name and address details) contained in submissions may be made available on the Department of Health website unless you indicate that you would like all or part of your submission to remain in confidence. Automatically generated confidentiality statements in emails do not suffice for this purpose. Respondents who would like part of their submission to remain in confidence should provide this information marked as such in a separate attachment.

Legal requirements, such as those imposed by the *Freedom of Information Act 1982*, may affect the confidentiality of your submission.

Future consultations

The Review Panel will be conducting a targeted workshop in Melbourne on 2 March 2015. The written submissions on both the Issues Paper and Discussion Paper, and the Review Panel's own analysis and research, will form the platform for the workshop.

The targeted workshop will focus on the following themes: efficiency, collaboration and research translation, and will include a combination of presentations and facilitated roundtable discussions. Stakeholders will have an opportunity to express their views to the Review Panel. Further information about the workshop and the Panel's consultation process is available on the review's website (www.health.gov.au/imrreview).

The Panel's Final Report will be a culmination of the issues explored through the Issues Paper, Discussion Paper and Workshop and will make recommendations based on the Panel's findings. The Panel's Final Report is due to be provided to the Commonwealth Minister for Health in late March 2015.

The Review

The review to strengthen independent Medical Research Institutes commenced in October 2014. Over previous years, a number of high profile reviews of Australia's health and medical research sector have been conducted. This includes the 1999 Strategic Investment Review of Health and Medical Research (conducted by Peter Willis AC) and a number of smaller, institutional and state-based reviews, such as Sydney University's Health and Medical Research Strategic Review and the New South Wales Health and Medical Research Strategic Review.

Most recently, in 2011, the Strategic Review of Health and Medical Research (McKeon Review) was commenced to seek a better vision for better health through research. The final report, released in April 2013, made a total of 21 recommendations aimed at significant reform of the health and medical research sector in Australia. The Abbott Government has taken these recommendations into account in the commitments it has made to date in relation to health and medical research.

The review to strengthen independent Medical Research Institutes was established to complement the work already undertaken by the McKeon Review, and to focus specifically on the role that iMRIs play in the Australian health and medical research sector. The review aims to identify what is required to ensure that iMRIs can make a strong contribution to a vibrant, collaborative, and innovative health and medical research sector in Australia and continue to benefit Australians through translation of research. The McKeon Review's recommendations will be a critical point of reflection for the Review Panel during the development of its own recommendations.

Contextually, the review to strengthen independent Medical Research Institutes is an important next step in developing Australia's health and medical research sector.

The National Health and Medical Research Council (NHMRC) has led Australia's development as a major health and medical research country for many decades. It is the source of most competitive funding for medical research undertaken at institutes, universities and hospitals. The NHMRC has alerted the sector to pressures that the sector will face in the next years. The consequence of this is predicted to be a decrease in the number of project grants and the funded rates, and an increasingly competitive grants process. This, combined with the tight fiscal environment has meant that Government is particularly concerned with ensuring that the Australian population receives the greatest possible benefit from investment of taxpayers' funds in health and medical research.

Overall, iMRIs produce high quality research. However, the nature of their research focus, size and narrowness of funding base have implications for financial sustainability. The relatively greater focus on biomedical science of most institutes also impacts the types of outputs generated by iMRIs. The research output of iMRIs is highly dependent on NHMRC and other government funding. Seeking out opportunities to diversify their funding base could assist with sustainability.

At the same time, the number and diversity of iMRIs operating in a "marketplace" with relatively few barriers to entry mean that it is difficult to ascertain the extent of duplication of research within the sector. The absence of a whole-of-sector perspective on research effort or priorities for research, or any structured coordination among iMRIs (beyond that initiated on an ad hoc basis by individual iMRIs) is considered material with respect to ensuring the effectiveness and efficiency of the sector as a whole.

The Panel has identified the following as 'priority areas' for this review:

- Long-term sustainability.
- Efficiency.
- Collaboration.
- Translation of research to outcomes.

The Panel's preliminary views on each of these priority areas are summarised on Page 7, and elaborated upon in this Discussion Paper.

Issues Paper

Initial consultation with iMRIs and the wider sector has been framed by the Issues Paper released in December 2014. Key themes drawn from submissions received on the Issues Paper are discussed in **Appendix A**.

Submissions on the Issues Paper offered a number of key insights, highlighting the diversity of the iMRI sector in terms of size, staffing arrangements, business models and finances, and collaborative approaches. It is worth noting that, while many submissions identified a need for additional government funding, the Review's Terms of Reference focus on efficiency, opportunities for collaboration and translational outcomes, rather than the level of, or mechanisms for, health and medical research funding in Australia.

Summary of Panel's Preliminary Views

Long-Term Sustainability

There are opportunities for iMRIs to monitor the financial sustainability of their organisation within a changing funding landscape. The Panel is of the preliminary view that iMRIs must be able to demonstrate that they are financially sustainable in the long-term, as a precursor to receiving government funding.

Efficiency

There are opportunities for iMRIs and the health and medical research sector more broadly to become more efficient. The Panel is of the preliminary view that efficiency measures should be better utilised in allocating government funding.

Private philanthropists have as much interest as government in knowing the efficiency and accountability of the iMRI that they are funding. Accordingly, the measures relating to reporting and analysis recommended by the Panel around sustainability and efficiency should be publicly available to assist private philanthropists in their own allocation of funding.

Collaboration

The Panel is of the preliminary view that partnerships between iMRIs, universities, hospitals, health services, industry and the community represent Australia's best chance of finding solutions to the range of complex health issues facing the population. Existing collaborations in the sector need to be strengthened with a focus on multi-disciplinary collaboration and clinical engagement.

Translation of Research to Outcomes

Translational research is critical to ensure that the Australian population receives the greatest possible benefit from government investment in health and medical research. The Panel is of the preliminary view that translation can be better facilitated through closer relationships with clinicians, hospitals and health services. The Panel is also of the preliminary view that opportunities exist for increased commercialisation, through stronger sharing of resources and attracting investment by industry.

Chapter 1: Context

The role of iMRIs in Australia

In the second half of the 20th century, iMRIs began to develop outside universities, arising from health services and hospitals, and have since become important contributors to the wider health and medical research sector in Australia. There are currently over fifty iMRIs¹ in Australia, with a reported combined annual turnover of over \$1 billion, and contributing to around 20% of all Australian publications in health and medical research (Measuring up: NHMRC)².

The majority of Australian iMRIs are not-for-profit organisations established under the *Corporations Act 2001* (Cth) which operate as independent legal entities. Most iMRIs receive the majority of their research funding through competitive grants for research projects, fellowships and programs, primarily through the NHMRC. The balance of other funding typically comes largely through state government infrastructure support, competitive grants from foundations and trusts, commercialisation collaborations and contracts, and community donations.

As the wider health and medical research sector has developed over recent years, the number of stand-alone iMRIs has decreased. Institutes within universities and those established by government, have demonstrated successful outcomes and the ability to attract strong philanthropic support. Collaborations in the wider sector have also resulted in the co-location of university centres and departments, health services and iMRIs in geographically-dedicated health and medical research precincts such as the Alfred Medical Research and Education Precinct, and the South Australia Health and Medical Research Institute.

The structure of the iMRI sector allows multiple institutes and other research facilities to undertake very similar research. A national overview of iMRIs or any structured coordination of their individual research efforts is an important factor for an effective and efficient sector.

Research output

iMRIs have made significant contributions to Australia's health and medical research sector. Unlike the university sector however, which is subject to a number of national (Excellence in Research Assessment) and international (e.g. TLS ranking, Shanghai Jiao Tong top 500

¹ Based on the definition from AAMRI's Submission to the National Commission of Audit, 2013

² Universities contribute to around 75% of all publication; hospitals contribute to around 25% (Note that because of collaboration between researchers, the total exceeds 100%) - National Health and Medical Research Council (2013) Measuring Up 2013. Canberra: NHMRC

ranking) ranking systems, there is no standardised way to measure or rank the research efforts and outcomes of iMRIs.

The NHMRC has undertaken comparative analysis of the publication output of Australia's top 10 iMRIs (which contribute almost 90% of publications from the sector) and Group of Eight member universities. This analysis found that the two sectors were broadly similar, although with more variations between iMRIs than Universities. The analysis showed that iMRIs produce, on average, slightly fewer publications per \$100,000 of NHMRC funding. Looking at the relative citation index, again the performance of iMRIs and universities were similar, although in the field of basic science, publications by iMRIs had a slightly higher relative citation impact. There were too few public health and health services publications produced by iMRIs to measure comparative output in these research pillars.

Recent reports have found that infrastructure costs for iMRIs in particular are high³. iMRIs are supported through the NHMRC's Independent Research Institute Infrastructure Support Scheme (IRIIS) and in many states through state schemes. Nevertheless, iMRIs have identified the indirect costs of research as among their major pressure points, and also as a barrier to collaboration. Given that iMRIs already benefit from Commonwealth and state funding arrangements for indirect costs (and for FBT), this situation raises questions about the sustainability of some existing arrangements.

Funding

The Australian Government has traditionally provided a strong funding base for health and medical research in Australia. The NHMRC is a key funder of Australian health and medical research (although not the only source) through competitive, peer-reviewed project grants. These research grants include: large scale and scope project grants, grants for 'Centres of Clinical Research Excellence', 'Centres for Health Services Research Excellence', translational grants such as 'Partnerships for Better Health and Development Grants', and a wide range of fellowships. In coming years, NHMRC anticipates increased growth in application numbers, grant size and grant duration, as well as increasing applications for fellowships. The consequence of this is predicted to be a decrease in the number of project grants and the funded rates, and an increasingly competitive grants process.

International trends in health and medical research

Internationally, there are a number of distinct types of institutes. These include independent institutes, such as the Whitehead Institute (USA); institutes operating as an integrated part of a university, such as those at the University of Texas MD Anderson Cancer

³ L.E.K. Consulting, 2009. *Costing Medical Research to Reform Health Outcomes: the case for indirect cost funding for Australian accredited MRIs*. Sydney, Australia.

NHMRC, 2010. *Independent Research Institutes Infrastructure Support Scheme (IRIIS) Funding Policy*, p.2, Canberra, Australia.

Centre (USA) and Johns Hopkins Medicine (USA); and government institutes such as the Germany Cancer Centre (within the Helmholtz Foundation) and the Institut national de la santé et de la recherche médicale (INSERM) in France. While the institutes that are independent make a point of their self-governance, most have a close affiliation with a university. In the case of the Whitehead Institute, all of the institute's principal investigators hold faculty appointments with the Massachusetts Institute of Technology.

Funding

International governments are key funders of health and medical research, although this funding is increasingly complemented by revenue from an institute's own activities. For example, in 2013, the funding available to France's Institute Pasteur was mainly sourced from industrial royalties, sales and services and research contracts.

Unlike in Australia, many major international research funding bodies provide funding for both extramural and intramural research. Examples are the UK's Medical Research Council and the USA's National Institutes of Health, which both have strong internal research programs, and the Canadian Institutes of Health Research, which is composed of 13 institutes and over 13,700 researchers across the country. In a number of countries, many major research institutes are also fully-government funded bodies.

Size

International institutes vary considerably in size. Smaller institutes of around 200 scientists and researchers are contrasted with very large entities such as the Max Planck Society in Germany which employs 5,470 scientists and researchers amongst its 17,000 permanent employees and 4,500 non-tenured scientists and guests. As in Australia, it is unclear how staffing arrangements with universities and health services may affect these numbers.

Collaboration

The strong links between international institutes and universities are exemplified by the Francis Crick Institute, a soon to be opened consortium of six scientific and academic organisations in the United Kingdom. The Francis Crick Institute aims to break down barriers between disciplines, work across institutions and integrate widespread knowledge to improve research outcomes and ensure efficient performance. The Francis Crick Institute refers to this process as "collaborating creatively".

Translational impact

Internationally, institutes are developing and reframing their strategic plans to focus on translational impact in order to improve population health and create economic opportunities. The UK's Francis Crick Institute, for example, has developed a strategic plan with a specific priority to accelerate translation of research.

Many have also established dedicated centres and groups for translational research or have formed partnerships with translational research organisations. For example, the University of Texas MD Anderson Cancer Centre has a laboratory solely for projects that focus on translational therapeutics. The Institute Pasteur has a translational centre that coordinates integrated responses and assists scientists to address regulatory requirements; it aims to develop an academic interdisciplinary program in translational research.

Another trend among international institutes is a focus on developing the translational skills of scientists through academic opportunities and training. The Memorial Sloan Kettering Cancer Centre has a translational research oncology training program - a two year program consisting of training grants to post-doctoral fellows to provide opportunities for early career scientists to work collaboratively with clinicians and develop translational skills. The UK's Weatherall Institute of Molecular Medicine at Oxford has a lecture series, the Jordan Tran Medical lecture, which promotes research that will have clinical utility.

An international perspective is critical to ensuring that Australia's health and medical research sector remains competitive and relevant, and continues to best position itself to collaborate with international researchers and overseas institutions. With the Australian funding environment becoming increasingly competitive, international examples also provide further incentive for iMRIs to diversify their funding sources.

Submission Financial Analysis

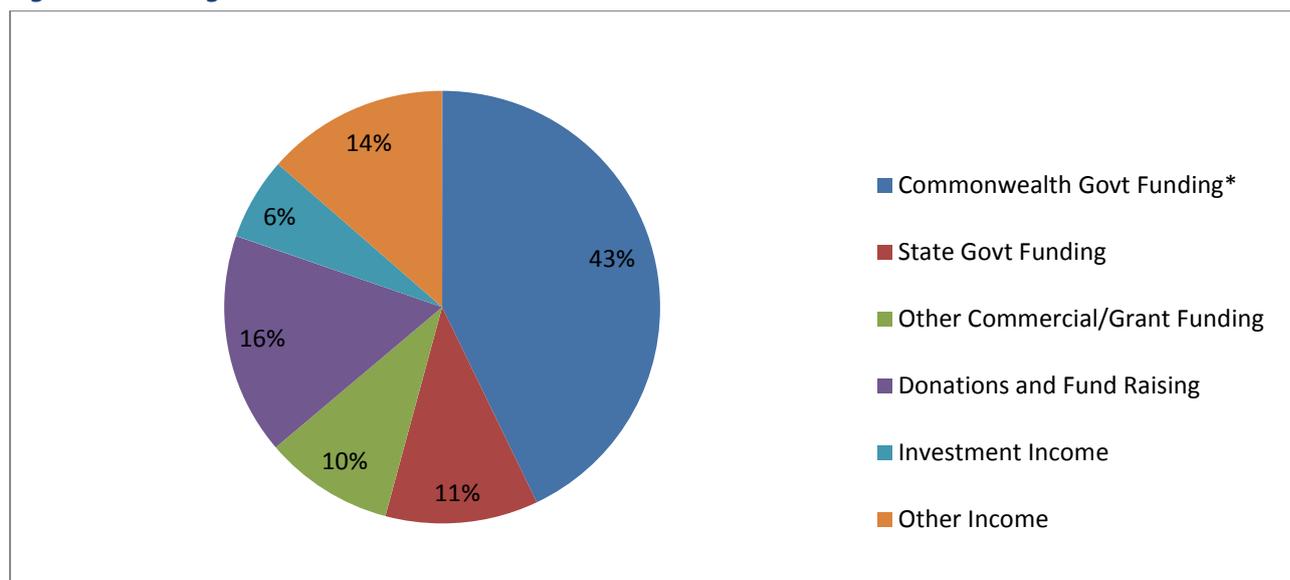
The business model templates submitted by iMRIs in response to the Issues Paper provide a snapshot of the sector. In total, business model templates were received from 31 iMRIs.

These 31 respondents cumulatively have:

- turnover in excess of \$1 billion pa, with individual iMRIs' turnover ranging between \$2 million and \$120 million pa,
- over \$2.2 billion in net assets,
- over 12,000 employees, postgraduate students and associates, and
- more than 370,000 square metres of floor space.

Based on financial information provided by respondents, the following charts break down the sector wide revenue sources and expenditure averaged over the past 3 years. Note that financial characteristics are not indicative of any one respondent; information is only reflective of the consolidated responses of the iMRI respondents to give an overview of the sector as a whole⁴.

Figure 1: Funding sources



*Approximately 20% of Commonwealth government funding relates to non-recurring capital grants.

The funding profile in Figure 1 indicates that the iMRI sector relies on a number of different income streams to fund their direct, indirect and capital growth requirements. The majority of the ongoing funding within the sector over the past three years has been sourced from the competitive grants processes of the Commonwealth Government and to a lesser extent State Governments. Other important income sources included donations and fundraising, commercial/industry grants, investment and commercial income.

⁴ Note that there may be some slight overlap between “Commonwealth Grant funding” and “Donations and fund raising”.

Whilst government funding remains the largest source of iMRIs' income, the analysis suggests that it is susceptible to significant changes on a yearly basis. It is apparent that those iMRIs with the stronger financial results showed a tendency towards a more diversified income base. Trends also suggest successful efforts by some iMRIs over the years to further diversify their income sources.

An increase in NHMRC five-year grant applications (a 3.5 fold increase since 2012) and an increase in the average budget of grants are together anticipated to lead to a reduction in the number of grants funded in forward years, which will further impact on the funding certainty within individual iMRIs. Those successful in winning grants will attain more certainty in their funding, however with the reduction in actual numbers of grants allocated, the ongoing viability of some iMRIs may be jeopardised.

Long term financial sustainability is intrinsically linked to the ability of the iMRI to both win competitive grants and attract income from diversified sources.

Figure 2: Application of Funds

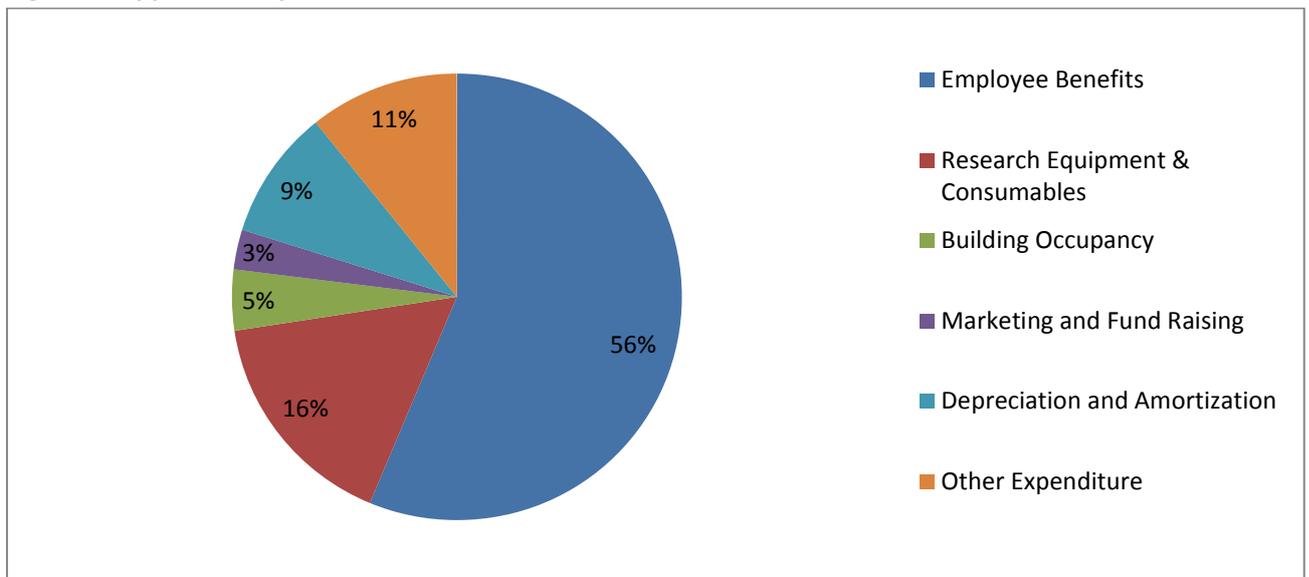


Figure 2 demonstrates that the greatest single ongoing expenditure for iMRIs relates to the costs associated with employing research staff to engage in the core research. Employee benefits comprise more than half of iMRI expenditure across the sector.

The year-on-year movements in competitive grant research funding for iMRIs are variable. This is contrasted with a more stable upward growth trend in expenditure from year to year. Supplementary and alternative funding sources are important to maintain long-term financial sustainability.

The completed templates provided indicate that the greater the economies of scale, the greater the funds available to fund direct research expenditure. Administrative costs

associated with the running of an iMRI are proportionately higher for smaller institutions that do not have the economies of scale.

Figure 3: Human Resources

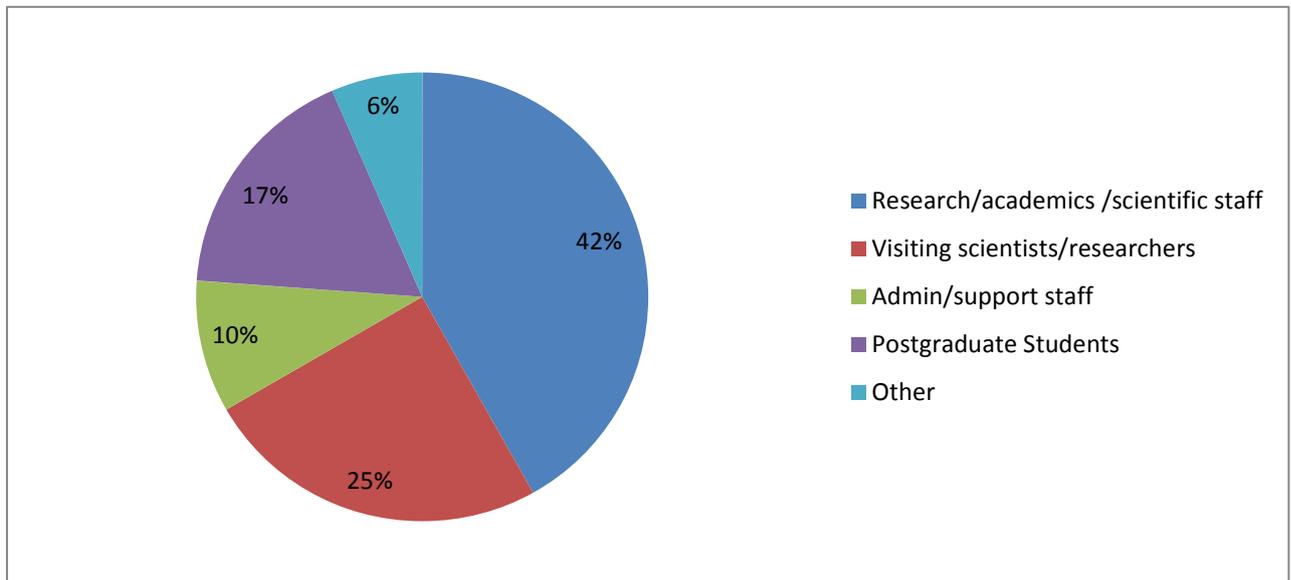


Figure 3 demonstrates that, of the 12,000 member workforce reported by the responding iMRIs, approximately 84% are dedicated to research within the sector. A substantial proportion are visiting scientists / researchers who are commonly employed by universities or local health areas while working on specific projects within iMRIs. The remaining workforce related to administration and other support roles.

The workforce mix varies significantly depending on the size of the iMRI. The larger the iMRI, the more likely the researchers and support staff are to be employed by the iMRI. The smaller iMRIs tend to have a less secure, but flexible, workforce where visiting researchers and scientists, and post graduate students tend to be a higher proportion of staff.

Chapter 2: Accountability and Value for Public Money

The medical research sector is highly dependent on public funding to undertake its research. As identified in Chapter 1, over half of the revenue required by iMRIs to conduct research is currently sourced from a combination of Commonwealth and State funding. As a matter of principle, it is reasonable to expect that the use of taxpayers' funds should be subject to a "value for money" test, irrespective of where and how these funds are spent.

In an increasingly competitive funding environment, it is imperative that funding bodies are able to determine the operational efficiency, outcomes delivered and long term sustainability of each institute in receipt of grants, and the institute's ability to make effective and efficient use of the funds it receives.

In 2011 the NHMRC established its current Administering Institution Policy which outlines the criteria an organisation needs to address in order to be recognised as an Administering Institution (AI) and administer NHMRC grant funds. An objective of this policy is to ensure that NHMRC funds are used effectively and efficiently for the purposes granted in a manner consistent with good administration of public money.

Information collected from MRIs at application to be an AI includes:

- Legal entity (e.g. ABN and/or ACN, physical site in Australia where research conducted)
- Audited annual account including statement of solvency and financial viability
- Membership of the governing body
- Research governance:
 - organisational structure demonstrating reporting responsibilities and roles,
 - employment contracts demonstrating institutions ability to exert influence over researcher,
 - policy/procedures to ensure NHMRC reporting requirements met, and
 - process to identify & manage conflicts of interest
 - Formal Agreement with Participating Institutions as per *Funding Agreement* clause 5.1-5.7
- Policies and procedures for:
 - Research integrity
 - Compliance with the Code for the Responsible Conduct of Research
 - Human ethics
 - Animal ethics
 - Financial management (including insurance)

As this information is not collected annually, the ongoing scrutiny of the effective and efficient use of public funds and the ongoing financial and operational position of the

funded institute is difficult to track throughout the grant lifecycle. Also The process currently available for the collection and analysis of financial information was not created to allow the analysis of the long-term sustainability or efficiency of individual iMRIs.

Alongside the above arrangements, a number of state governments that administer grants to the sector have reviewed their grant funding processes. The diverse nature of iMRIs, and the research they conduct, has highlighted difficulties in analysing the operational efficiency and long-term sustainability of individual iMRIs, and in the ability to compare 'like' entities at a sector wide level.

Standardised financial and operational reporting is an avenue that the Victorian Government and the NSW Ministry of Health have introduced to add financial transparency and comparability. Through standardised annual financial and operational reporting there is now a level of scrutiny that helps the State funding bodies gain a greater understanding, and ultimately work towards ensuring the effective and efficient use of the funds they provide.

In addition to assisting funding bodies, individual iMRIs are also able to benefit from standardised information that would allow them to consider their own long term sustainability and operational efficiencies.

The Panel has identified an opportunity for funding bodies at Commonwealth level to leverage the approach already taken by some state governments, and to adopt a similar approach to the ongoing assessment of the long-term sustainability and operational efficiency of iMRIs within the medical research sector.

Chapter 3: Panel's Preliminary Views

This chapter outlines the Panel's preliminary views on the iMRI sector, which have been developed through analysis of submissions on the Issues Paper, additional consultation and independent research.

Key Elements of a successful iMRI

The Panel has determined that the areas of sustainability, efficiency, collaboration and translational impact should be key areas of focus in business planning for iMRIs and has developed preliminary views on these issues, as indicated in the shaded boxes in this chapter. The Panel welcomes comments or opinions on these statements.

As previously discussed, the Panel agrees that, in order to receive government funding, organisations will need to demonstrate value-for-money in their use of public funds. To highlight value-for-money, iMRIs will need to consider if they have implemented an efficient and sustainable business model, if they are actively pursuing collaboration with other iMRIs, universities and/or hospitals, and that funds provided by Government will be used to actively translate research findings into clinical practice and positive health outcomes.

Long-Term Sustainability

There are opportunities for iMRIs to monitor the financial sustainability of their organisation within a changing funding landscape. The Panel is of the preliminary view that iMRIs must be able to demonstrate that they are financially sustainable in the long-term as a precursor to receiving government funding.

Although NHMRC's Program, Fellowships and Centres of Excellence schemes have historically offered 5 year grants, the Council's move to emphasise availability of 5 year projects grants and encourage wider uptake of these longer grants has meant that fewer grants have been made available. The Panel considers that it would be poor management of public funding to award a 5 year grant to researchers in an iMRI (or other organisation) which is unable to demonstrate that it is financially sustainable for the life of that grant.

As an example, the Office for Health and Medical Research (OHMR) within the NSW Ministry of Health administers the *Medical Research Support Program* (MRSP)⁵ program and has

⁵ The NSW Government established the Medical Research Support Program (MRSP) to provide infrastructure funding to independent health and medical research organisations that met a range of selection criteria. MRSP provides infrastructure funding on a competitive basis and has been operating in its current form since 2003. A 4 year funding cycle and tiered funding structure has been introduced for the 2012-2016 funding round.

worked to identify benchmarks to evaluate the financial sustainability of medical research institutes. The standardised reporting templates and the key indicators used for the annual financial evaluation of the MRSP institutes have been developed, implemented and adopted within the sector during the 2012-2016 funding round. The iMRIs have reported to the OHMR on an annual basis for the last three financial years.

The panel is considering recommending a similar approach to assess the long-term sustainability of iMRIs. A summary of the panel's preliminary 'Suggested Reporting Methodologies' is at **Appendix B** for your reference.

The development of the MRSP reporting templates was designed to allow for the variances in the institutes' operations to be clearly identified thus creating unbiased comparison groups, and to minimise the burden associated with additional reporting which is not already being undertaken internally.

The Financial Sustainability indicators have been developed to measure:

- current financial performance (based on the Statement of Comprehensive Income),
- financial position of the institute (based on the Statement of Financial Position), and
- cash flow sustainability (based on the Statement of Cash Flows).

The Financial Sustainability indicators can be utilised to analyse the following, for example:

- compare the performance of the institutes for each specific indicator,
- measure variance of an institute's performance to the others, and
- measure the performance of the institutes within the groupings based on the principles as outlined above.

By implementing comparative performance indicators for long-term sustainability, iMRIs will, at a federal level, have the opportunity to assess themselves against other iMRIs in the sector. This also has the potential to assist private and public sector funding sources in determining the comparative sustainability of iMRIs.

Ability to attract research grant income and dependence on grant income

The majority of iMRIs receive funding from either or both Commonwealth and State/Territory Governments which contributes to their overall income. In order to produce a more sustainable business model, which is able to persist in an increasingly competitive funding environment, iMRIs may need to pursue supplementary and/or alternative sources of income such as:

Increased Philanthropic Support

Philanthropy is an important source of support for health and medical research. Effective health and medical research depends on investment from not only government, but also industry and the community. A strong pool of philanthropic dollars for health and medical

research has the potential to boost the sector's national capability to address health challenges.

Additionally, a major benefit of philanthropic contributions is in the injection of substantial funds to help create foundations or for capital works which increase the financial strength of iMRIs and improve their long term sustainability.

A study by the Queensland University of Technology⁶ found that:

- leading nations have research supported by multiple sources, including government, industry and philanthropy;
- philanthropic funding can address gaps in other funding sources, including high risk investments, rare diseases and global health issues; and
- philanthropic funding generates an increase in funding from government and industry sources.

An iMRI with strong reliance on philanthropic sources of funding, however, may be vulnerable to donor fatigue, where individuals or organisations that have previously provided philanthropic support to a cause cease to do so. Causes of donor fatigue may include desensitisation due to repeated messages; a lack of interest in the cause; and no sense of urgency. Donor fatigue may be particularly problematic in areas with a high concentration of iMRIs that are in competition with each other for funding. Strong fundraising expertise is needed in order to mitigate the effects of donor fatigue – this may include updating and tailoring fundraising messages and targeting new supporters.

Commercial Income

The private sector is a potential major source of funding for iMRIs. In its 2008 report, Access Economics⁷ found that between 2000/01 and 2004/05, business investment in health and medical research grew at an even greater rate than the rate of government funding. Industry has the potential to contribute to the work of iMRIs by providing funding in the following areas:

- Research and development – the majority of which is directed to experimental development and applied research
- Biotechnology – Mainly in the area of human therapeutics, diagnostics and devices.
- Pharmaceutical industry – A high-technology, knowledge-intensive sector which invests over \$1 billion in research and development annually and reportedly around \$600 million in clinical trials in Australia.
- Medical technology
- Venture capital and private equity

⁶ Queensland University of Technology. 2005. *Lifting the Life giving Dollar*, report for Research Australia.

⁷ Access Economics, 2008, *Exceptional Returns: The Value of Investing in Health R&D in Australia*, <http://www.asmr.org.au/ExcepiI08.pdf>

Organisations that have other sustainable sources of revenue such as fundraising, and investment activities, are not as dependant on competitive grant revenue which may vary greatly on an annual basis.

A commonly used measure for assessing whether iMRIs are attracting sufficient grant income and their dependence on this source of funding is to determine the proportion of grant revenue within the iMRI to total revenue and the growth in revenue.

Ability to meet operating/funding commitments

Submissions on the Issues Paper indicated that cash flows and the financial assets held by iMRIs to maintain and manage their operations in the short to medium term is varied.

Regardless of size, organisations that have good cash flow management and financial assets to manage variances in revenue generation demonstrate their ability to sustain themselves in a changing funding landscape.

The capacity of an organisation to meet its operating/funding commitments can be determined by measuring the financial strength of its income statement and balance sheet based on commonly used measures, for example Asset and Revenue Growth Ratios, Working Capital Ratio, and Expense Cover Ratio.

Efficiency

There are opportunities for iMRIs and the health and medical research sector more broadly to become more efficient. The Panel is of the preliminary view that efficiency measures should be better utilised in allocating government funding.

Submissions made on the Issues Paper largely agreed that, regardless of the size of the iMRI, efficiencies were possible. The panel sees the 'efficiency' element of the review as encompassing both the financial and scientific efficiency of an iMRI, and the efficiency of the health and medical research sector as a whole.

Financial Efficiency

A number of iMRIs, state Governments and research partnerships have implemented a range of strategies to ensure iMRIs are more efficient and better utilise the funding provided by Government. A key example is the financial monitoring and assessment work undertaken by the Office of Health and Medical Research in New South Wales in partnership with O'Connell Advisory, to assess financial sustainability across the iMRI sector in New South Wales.

The panel is considering developing a monitoring framework to include data collection that could be used to measure financial efficiency in the future. Further information on the panel preliminary methodology and suggested financial reporting requirements is at **Appendix B**.

The Operating Efficiency Indicators can be utilised to analyse the following, for example:

- compare the performance of the institutes for each specific indicator,
- measure variance of an institute's performance to the others, and
- to measure the performance of the institutes within the groupings based on the principles as outlined earlier.

Grant revenue utilisation within the research function

Submissions on the Issues Paper have indicated that grant revenue is a key source of revenue for iMRIs. Optimum utilisation of the revenue stream is important for the ongoing financial performance at the iMRIs.

Due to the variances in the size and operations of the iMRIs, a commonly used measure for assessing whether grant revenue is being used efficiently is to determine the Grant Revenue per Research FTE.

Staff establishment & mix

Submissions on the Issues Paper have indicated that the staffing profile of iMRIs is varied. Management of staff numbers and mix is important for the ongoing financial performance of iMRIs as this can be used to determine if the time/effort of the staff is being optimally utilised for the institute's functions.

Commonly used measures to assess the staff number and mix are - percentage of Administration FTEs to Total FTEs, and the ratio of Students to Research Group Heads. This simple analysis would need to be adjusted to factor in the differing employee engagement policies across this sector.

Staff costs at the organisation

Submissions on the Issues Paper have indicated that staff costs in the iMRIs are varied across all staff types. Management of staff costs is important for the ongoing financial performance of the iMRIs as they usually account for the largest share of costs incurred by the organisations.

Commonly used measures to assess the staff costs are – percentage of Staff Costs to Total Costs (overall & by FTE type), and the percentage of staff costs to income.

Efficient use of facilities

Seeking new infrastructure projects is particularly popular among research organisations as these can attract additional sources of government funding and are favoured by philanthropic donors, however submissions on the Issues Paper indicated that new infrastructure is often underutilised.

Those organisations that have large new facilities and insufficient staff to fill these facilities may be encountering significant maintenance/servicing costs. Inadequate use of facilities

that have been built with the assistance of government funds represents a potentially avoidable inefficiency.

To counter this problem, these institutes may look to lease additional research space to other research organisations, universities or the private sector (e.g. start-ups, biotech companies) as a means to both utilise the space being inefficiently used, and capitalise on a potential alternative source of income.

Lease arrangements for laboratory space are becoming increasingly popular as a way for smaller research institutions to enter expensive urban centres quickly, cost-effectively, and with more flexibility than building new. Leasing may not only prove more cost effective than new construction, but also enable institutions to more quickly become established in popular research clusters..

A commonly used measure for assessing whether facilities are being used efficiently is to determine the number of researchers per square metre of research space.

Sharing of back-of-house administration

Submissions on the Issues Paper indicated that there were significant costs associated with support staff and that sharing back-of-house services represented a potential saving for research organisations.

In its 2012 report, *Community Sector Shared Services, Why consider Shared Services? The advantages, disadvantages and challenges*, the then Victorian Government provided an introduction to the benefits of shared services designed for the Not-For-Profit sector.

The findings of this report can be translated to benefit the iMRI sector. Shared back-of-house services involves two or more iMRIs working together, or agreement with a university or local health service, to manage or deliver non-research specific services. Back-of-house services include any service that does not directly support the research, e.g. human resources, finance, payroll, information and communications technology (ICT), marketing, procurement, legal advice. Sharing back-of-house services generally offers greater opportunities and fewer hurdles compared with sharing front of house services in the iMRI sector.

Sharing back-of-house services with other iMRIs, universities or health services can be an excellent way for research organisations to reduce cost and improve research efficiency, allowing research staff to focus more on their core mission and less on administrative and support functions. Adopting this model could also serve to strengthen existing relationships with other iMRIs and potentially reduce duplication of research.

Sharing of Equipment

Research equipment represents a significant cost to each iMRI. In recent years the cost of purchasing and maintaining core research equipment has placed increased pressure on

finite budgets. Logically, if core equipment is shared among multiple researchers in different organisations, it will both be utilised more often and be efficient in terms of cost to each organisation. Sharing capital-intensive core facilities may also allow a larger number of researchers to conduct investigations into a wide range of areas. Economies of scale can mean that equipment is updated on a shorter cycle resulting in researchers accessing state-of-the-art technology more quickly.

In short, a coordinated approach to equipment utilisation can deliver increased financial efficiencies, including reduced opportunity costs, provide more researchers with access to the equipment and support services, and facilitate collaboration between researchers.

Sharing of equipment need not come at the sacrifice of an organisation's independence. At the Translational Research Institute in Brisbane, four separate research organisations share a single set of core equipment, while each retain their individual identity.

Scientific Efficiency

Health and medical research is central to strengthening Australia's capacity to address its current and emerging health challenges. It is essential that the research that is supported by the Commonwealth Government makes the most efficient use of the finite resources available.

Building upon financial efficiencies of individual research organisations, it is critical that research is conducted in the most efficient and effective way possible. This requires ensuring that research is being conducted by the best team with the most appropriate resourcing to address the health and medical research needs of Australia.

The Panel recognises that it is unsustainable to support multiple separate groups undertaking very similar research in a competitive manner. Australia's public and private investment in medical research will be maximised when duplication is reduced, collaboration is promoted and the impact of the research is fully realised. At the level of individual iMRIs, ongoing monitoring of productivity will assist in measuring the progress of the sector.

Internationally and in Australia there has been much discussion, but difficulty in obtaining consensus, on how to measure productivity/research effectiveness of medical research generally, particularly given the potential time lag (ranging from as little as 12-18 months up to 20 years) between inputs and outputs/outcomes.

Efficiency of the Sector

Improvements in the financial and scientific efficiency of individual iMRIs may in turn have a positive impact on the efficiency of the health and medical research sector. As previously stated it is difficult to ascertain the extent of duplication within the sector due to the lack of transparency and reporting.

However it is considered that a system-wide perspective or approach to research may reduce costs, minimise duplication, and boost efficiency. iMRIs should also look to explore potential collaborative or cooperative relationships with other organisations as a means to reduce potential duplication, thereby increasing the efficiency of the sector.

The business model templates submitted by iMRIs in response to the Issues Paper demonstrated that there is a high degree of variability and resultant obscurity in the publicly available financial information relating to individual iMRIs. The Panel is of the preliminary view that this is not a satisfactory level of transparency, considering the significant investments made by both government and private philanthropists.

Private philanthropists have as much interest as government in knowing the efficiency and accountability of the iMRI that they are funding. Accordingly, the measures relating to reporting and analysis recommended by the Panel around sustainability and efficiency should be publicly available to assist private philanthropists in their own allocation of funding.

Collaboration

The Panel is of the preliminary view that partnerships between iMRIs, universities, hospitals, health services, industry and the community represent Australia's best chance of finding solutions to the range of complex health issues facing the population. Existing collaborations in the sector need to be strengthened with a focus on multi-disciplinary collaboration and clinical engagement.

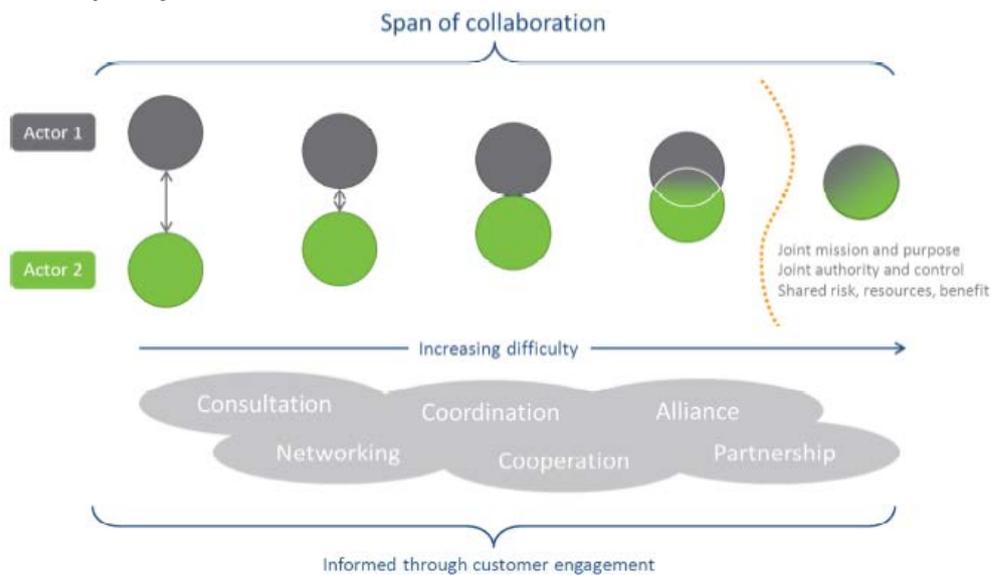
Submissions on the Issues Paper outlined the various ways that collaboration is already taking place in the iMRI sector. Largely this occurs on two levels - research collaboration between individual researchers, and cooperation on specific strategies and facilities between institutions.

The NHMRC's 'Measuring Up 2013' Report⁸ indicated that collaboration between individual researchers is very common with 95% of all biomedical publications in Australia being multi-authored. The report states that collaboration in research underpins innovation and enables researchers to contribute to the global research effort by sharing knowledge and skills and by leveraging funding, resources and risks.

⁸ National Health and Medical Research Council (2013) *Measuring Up 2013*. Canberra: NHMRC

As suggested earlier in the paper, it is difficult to ascertain the extent of institutional cooperation due to the lack of transparency in the system. Very few submissions on the Issues Paper outlined the nature of iMRIs' cooperative relationships with other organisations. Recent research has found that organisational collaboration comes in many different forms, spanning less close relationships to highly collaborative partnerships.⁹ Although moving along this span of collaboration presents a number of challenges, the Panel is of the preliminary view that iMRIs need to move further towards the partnerships model of collaboration with other organisations in order to produce the best outcomes for the sector. A pictorial representation of this collaborative continuum is at Figure 4.

Figure 4: Span of collaboration



Source: Noug Group 2013, *Collaboration between sectors to improve customer outcomes for citizens of NSW: Research report prepared for the NSW Public Service Commission, NSW, Australia. Available online at http://www.nouggroup.com.au/images/news_attachments/Collaboration_research_report.pdf*

A key enabler for organisational cooperation is shared benefit for organisations. Cooperative relationships that are complementary in nature have the highest chance of success, as they enable organisations to access a different range of skills and resources. The Panel believes that strengthening partnerships between iMRIs and with universities, health services and industry will enhance the quality of health and medical research in Australia, and that each of these potential collaborations hold unique benefits for the sector.

iMRIs

The efficiency section of this Discussion Paper has highlighted the various ways in which collaborations between iMRIs could be strengthened. In addition to the potential

⁹ Noug Group 2013, *Collaboration between sectors to improve customer outcomes for citizens of NSW: Research report prepared for the NSW Public Service Commission, NSW, Australia. Available online at http://www.nouggroup.com.au/images/news_attachments/Collaboration_research_report.pdf*

efficiencies to be gained through sharing of back-of-house services infrastructure and equipment, collaborations between iMRIs mean that there are additional resources (funding, researchers, and infrastructure) to dedicate to larger-scale research projects.

Universities

Submissions indicated that institutional cooperation between iMRIs and universities is already prevalent across the health and medical research sector. Cooperation with academic organisations allows iMRIs to access expertise that may not be available in-house, for example, engineering, population health, and “big data”, behavioural sciences. This multi-disciplinary approach to research is increasingly important to approach health problems from a whole-of-system approach, and in new, innovative ways.

Partnerships between iMRIs and universities also allow an iMRI to undertake projects on a larger scale.

In addition to the research benefits, partnerships between iMRIs and universities present a range of options to both organisations in relation to staffing. For example, secondment arrangements allow staff to move between organisations. This benefits the organisation by ensuring a turnover of staff; universities have access to established researchers who are able to teach and train the next generation of researchers, while early-career researchers are able to devote themselves to research fulltime in an iMRI-environment.

Health Services

Cooperative relationships between iMRIs and health services are key to ensuring that research remains high quality, relevant and tailored to the needs of the Australian population. Collaboration between researchers and clinicians is well developed in the USA, Canada, the Netherlands and the UK¹⁰. The McKeon Review and 2012 NSW Health and Medical Research Strategic Review recommended better links and increased collaboration between health and medical research and health services organisations.

Close partnerships between researchers and health services enable researchers to work with experienced clinicians to identify frontline problems (so-called “bedside-to-bench”). This clear “line of sight” to patient care ensures that research is driven by the health needs of the population. Working with health services to identify and focus on research problems also establishes links that can be used to more easily translate research into practice.

Health services also realise benefits from collaborating closely with researchers. The opportunity for clinicians to be involved in setting research agendas and finding solutions to widely experienced clinical problems helps to attract high quality clinicians to particular areas. A key example of this is the partnership between the Hunter Medical Research Institute (based in Newcastle, NSW) and the Hunter New England Local Health District.

¹⁰ NSW Health and Medical Research Strategic Review 2012, NSW Ministry of Health, p. 29

A key objective of NHMRC's Advanced Health Research and Translation Centre's initiative is to promote this stronger research, clinical practice and policies integration.

Industry

Links with industry are critical for the sector to move forward. Internationally, strong collaboration between researchers and industry has led to increased innovation (e.g. Silicon Valley, the Cambridge Science Park).¹¹

Industry support is also critical to diversifying funding sources and thereby increasing the financial sustainability of the sector. Strategic collaboration with industry to identify areas of research interest has the potential to open up additional funding streams to iMRIs. Establishing links with industry also better facilitates the commercialisation of research. Commercialisation is further addressed under the Translational Outcomes section of this paper.

Industry leading multinational organisations with a global focus present a significant opportunity for Australian iMRIs. Strategic decisions are driven from head offices, mainly located in Europe or the US, incorporating collaborative arrangements with iMRIs globally. Participating in activities funded by industry will require iMRIs to develop effective international collaborations and global reputations within their research area.

In Australia, success in this area has been demonstrated through the creation of the Australian Hearing Hub. The Australian Hearing Hub has united researchers, educators, clinicians and innovators with expertise in audiology, speech pathology, cognitive and language sciences, psychology with industry-leading nanofabrication and engineering scientists. Similarly, CSL has made significant contributions to research in Australia, particularly in collaboration with the University of Melbourne.

International collaboration

Similar to the links formed between domestic researchers, individual researchers are making strides to create and maintain links with other researchers internationally. Approximately 41% of contemporary Australian medical research publications have at least one international author.¹²

Very few submissions on the Issues Paper detailed cooperative relationships between iMRIs and international institutes at the organisational level. Maintaining strong organisational links to international institutes may help to improve the impact of the research conducted by the iMRI, and may subsequently attract international researchers to Australian institutes.

¹¹Department of Education and Department of Industry, 2014, *Boosting the commercial returns from research*, Available online <https://education.gov.au/news/discussion-paper-boosting-commercial-returns-research-released>

¹² National Health and Medical Research Council (2013) *Measuring Up 2013*. Canberra: NHMRC

Challenges for the sector

The Panel is of the preliminary view that further cooperation and collaboration is critical to the future of the iMRI sector, while acknowledging that the nature of the sector creates a number of challenges that need to be considered.

- Strategic conversations must occur across the sector, and involving government, about research priorities. The most critical enabler for collaboration both at an individual researcher and organisation level is a shared purpose. A core alignment of organisational research aims is vital to successful cooperation between organisations.
- Collaborations need to take into account the importance of “branding”/identity to both iMRIs and Universities.
- Governance arrangements for the iMRIs are crucial to their viability and any collaboration needs to determine the approach to be taken to ensure clarity of responsibilities and accountabilities, including addressing, for example:
 - Ownership of research direction
 - Management and control of research objectives
 - Establishment and support for long term strategic planning
 - Access to facilities
 - Access to students
 - Staff contractual arrangements
- iMRIs will need clarity regarding their separate funding streams – whether revenue streams remain separate and if not, how funding will be allocated to different research facilities and research priorities, etc.
- Intellectual Property (IP) issues need to be resolved. For example the Boosting the Commercial Returns from Research paper produced by the Department of Education and Department of Industry¹³ suggests that difficulties associated with IP are a strong deterrent for businesses further collaborating with the sector in order to increase commercialisation (estimated that contracts can take up to 10 months to develop).
- The cost (time, effort, sometimes financial) of collaboration, and the need to assess whether the incentives outweigh the costs. Submissions on the Issues Paper indicated that establishing these cooperative arrangements between organisations can take up to 5 years.

Cooperative relationships with other organisations have the potential to benefit iMRIs in a number of ways, including alleviating financial pressures and accessing financial benefits, improving quality of research, ensuring that organisations are accountable to each other,

¹³ Department of Education and Department of Industry, 2014, Boosting the commercial returns from research, (p.16) Available online <https://education.gov.au/news/discussion-paper-boosting-commercial-returns-research-released>

increasing innovation, and enabling access to a range of expertise. The Panel is of the preliminary view that strengthening partnerships between organisations, researchers, clinicians, industry and the community represents Australia's best chance at finding solutions to the health issues that face the population

Australian iMRI Collaboration Strategies

The iMRI sector in Australia is heterogeneous in terms of size, business models, and collaboration with other iMRIs, the hospital sector and universities. Most submissions received by the Panel indicated that there was no 'one size fits all' model that could be applied, as iMRIs are too diverse in both their business strategies and their research areas to conform to a single design. The Issues Paper submissions indicated that there were positives and negatives to each strategy, with the most common strategies being:

Stand-alone

An iMRI operates independently, potentially exploring efficiencies within existing operating parameters but not pursuing or expanding relationships with other iMRIs, universities hospitals or health services.

Advantages

This model may be most appropriate for larger, financially sustainable iMRIs. However, in the increasingly competitive domestic and international environment, there may be long-term sustainability issues. All iMRIs, and indeed other medical research organisations would be advantaged by seeking greater efficiencies and effectiveness in their operations and activities.

Considerations

For those iMRIs which may have long-term financial sustainability concerns, remaining independent could represent a serious potential financial risk or impede a more effective sustainability solution. Additionally, iMRIs that elect to remain independent may continue to be more susceptible to changes in the less predictable philanthropic environment.

Submissions on the Issues Paper indicated that researchers are becoming increasingly uncomfortable with the largely unstable employment conditions associated with uncertain, less predictable funding structures. In the interest of maintaining knowledgeable and experienced research staff, iMRIs should look to modify their business model in ways that provide longer-term stability for the iMRI and their staff, rendering them less susceptible to changes in government funding or philanthropy.

Merged

Some iMRIs which had previously conducted similar research or operated within a similar geographic area, have merged in recent years as a means to attract more funding and achieve critical mass of research and support staff. An example would be Monash Institute of Medical Research and Prince Henry's Institute which joined in 2014 to make MIMR-PHI.

Advantages

Whilst smaller iMRIs may be more flexible and adaptable to changing needs, they must achieve an economy of scale of skilled staff and resources in order to be considered sustainable and efficient. In general, an iMRI which has high relative overhead costs and low levels of income is unlikely to have a sustainable means of maintaining its own support services and infrastructure efficiently and offer researchers some ongoing certainty. iMRIs which have implemented a merged model typically do so to share the cost of research platforms relying on large scale capital investment. The need for management and governance support staff, information technology support, public relations and fundraising staff all represent a multiplication of costs and effort, drawing on limited funds which might otherwise be available for research and research support. This model offers an opportunity to reduce this duplication.

iMRIs that do not have sufficient critical mass or robust mechanisms to ensure continuing scientific and intellectual viability, or adequate linkages to ensure translational interfaces are developed with hospitals or universities – should consider exploring this model with other iMRIs. The merger of iMRIs presents an opportunity whereby iMRIs can maintain their independent status whilst reaching critical mass in terms of staffing, infrastructure and resources.

Whilst there is no particular number of staff that the Panel has identified as representing the ‘best practice standard’ for an iMRI, the Panel agrees with responses that indicate that iMRIs need to reach a ‘critical mass’ or ‘economy of scale’ of both research and support staff if they are to be considered operationally efficient and financially sustainable in the long term. Mergers between iMRIs may present an opportunity to pursue economies of scale and achieve synergies for all stakeholders.

The merging of iMRIs which share a research discipline may also help to reduce research duplication, focus on key research priorities and create efficient ‘knowledge hubs’.

Considerations

The Panel understands that in order for two or more iMRIs to merge, there are many, and potentially complex, issues to be considered and addressed. These include financial, governance, administrative issues, vision and objectives alignment, as well as scientific considerations. Examples of issues to be considered include:

- Appropriate governance structure to maintain a strong focus on the organisations’ long term strategy and implementation of the research objectives
- Maintenance of the organisations’ identity/brand recognition to assist ongoing fundraising capability
- Name and branding of the entity
- Location of corporate headquarters

Contractual Affiliation

There is clear acknowledgement that the sector is already moving towards further collaboration, for example through the National Health and Medical Research Council's Advanced Health Research and Translation Centres, in New South Wales through the Health Ministry's Research Hubs, and in Victoria through the Academic Health Science Centres. Given the close relationship between education and clinical care research, there are opportunities for iMRIs to further enhance their collaboration, in particular with universities, hospitals and health services.

Many iMRIs in Australia already have contractual affiliations with other iMRIs, universities hospitals or health services. These affiliation agreements vary from relatively simple (and non-binding) memoranda of understanding to partial/full integration into universities, and appear to be quite variable in their scope of agreed activity.

Advantages

iMRIs that are heavily dependent on less predictable income (i.e. competitive grants, philanthropy) as a core part of their business model, could benefit from closer association or affiliation with other iMRIs, universities, hospitals or health services without necessarily losing their autonomy and distinctive research mission.

Submissions received from the sector highlighted the academic, financial and commercial benefits of the affiliations between iMRIs and universities, hospitals or health services. A number of options were identified for iMRIs to improve their collaboration both within and outside the research sector, primarily with universities and health services. It is clear from submissions that iMRIs, universities, hospitals or health services alike are generally interested in moving from an environment of competition to an environment of collaboration which ensures more effective use of available resources, and builds mutually rewarding partnerships that thrive on research excellence.

These relationships can be beneficial not only to the iMRIs and universities, hospitals or health services but to the researchers as well. Often researchers who are employed by the iMRI and are involved in these affiliations hold an adjunct position with the university or hospital. As it stands, iMRIs and universities are currently in competition for the best postgraduate students. The Panel is of the preliminary view that a collaborative relationship would directly benefit the students, who would receive a more varied education with possibly stronger employment prospects, and also benefit both the iMRI and the university who could play a joint role in the students' training.

Internationally, collaborations between institutes and universities, hospitals or health services are strongly developed (e.g. the Broad Institute of MIT and Harvard), and the Panel is persuaded that formal partnerships between these entities in Australia would deliver significant benefits to both parties, the wider health and medical research sector, and patients.

Considerations

Formal affiliations have required the following critical considerations, noting that the involvement of more than one university could increase complexity:

- Financial independence – This is essential for an iMRI to maintain its ‘independent company’ status.
- Philanthropic engagement – Donor networks are often linked to Board membership of iMRIs, and this would need to be considered should Board arrangements change.
- Jointly beneficial arrangements regarding PhD students
- Research focus –In drafting the affiliation agreement consider the extent to which the university or health service can or will influence the research focus of the iMRI.
- iMRI research staff who actively contribute to the mission of the university may meet scholarly and academic merit criteria, and be eligible for honorary academic titles.
- Ownership of Intellectual Property – this needs to be negotiated from the outset to ensure successful collaborations.

In considering options to further enhance the relationships between iMRIs, universities and hospitals, the Panel acknowledges that collaboration potentially requires investment of considerable time and resources on the part of iMRIs. Further information is required to better understand how collaboration arrangements can be structured to be mutually beneficial for iMRIs and universities.

Integrated

Submissions found that collaboration between iMRIs and other organisations such as universities, hospitals and local health services occurs along a continuum from sporadic communication and interaction, through co-ordination and co-operation around specific research projects, to more formal, comprehensive and sustained partnerships and integrated operation. Partial or full integration into universities, hospitals and Local Hospital Networks (LHNs) represents the most collaborative and potentially least independent model on the spectrum. There are many different models of institutes within large, research intensive universities worldwide. Australian examples would include the Hunter Medical Research Institute which is integrated with the University of Newcastle and the Hunter New England Local Health District.

Advantages

Submissions have shown that the integration of some sub-critical mass iMRIs into research intensive universities has meant the iMRI can share the financial burdens associated with medical research, and has advantaged the universities through access to, and participation in, research undertaken by iMRIs.

In particular, the Panel believes that universities enable iMRIs to more readily access diverse, multidisciplinary teams that are necessary to further advance the profile of the sector and achieve higher levels of research translation. It is the Panel's preliminary view that the pathway from research to clinical practice as mediated through universities, iMRIs and hospitals could be simplified and shortened through iMRI/university integrations.

There are opportunities for iMRIs who choose to explore partial/full integration into universities, hospitals or LHNs to gain access to and co-invest in expensive research platforms which will enable more and better research to be undertaken, and will facilitate the translation of research to practice. Submissions from universities and collaborative networks indicate that they recognise the advantages of being closely allied with strong collaborative iMRIs.

Considerations

Those iMRIs that have integrated fully into universities, hospitals or LHNs may have had to consider the following:

- Potential risks to philanthropic donations.
- Whether their patronage or branding may need to be changed, and whether this would have implications for philanthropic donations to the iMRI.
- The level of independence and control that they might have with regard to research priorities.
- Impact on iMRI staff and university students.
- Strong and clear contractual arrangements which outline the expectations and responsibilities of each party.
- Clarity around ownership of intellectual property.
- Clear arrangement regarding the use of joint equipment.
- A single process for obtaining ethics approval.
- Clear lines of communication between research staff and university administration.
- Intellectual Property arrangements.
- The impact and complexities around FBT exemption for iMRIs, but not Universities.

The Panel is of the preliminary view that assimilating iMRIs into universities, hospitals or health services provides an opportunity to reduce the financial risks to which vulnerable Institutes are exposed by bringing them into a larger entity, and also reduce the scientific risk associated with a narrow research effort. The loss in autonomy and independence, and the involvement by university administrations may be offset by enhanced security and other opportunities associated with larger universities. Careful consideration of the governance structures for the integrated iMRI may minimise the risk of less favourable outcomes.

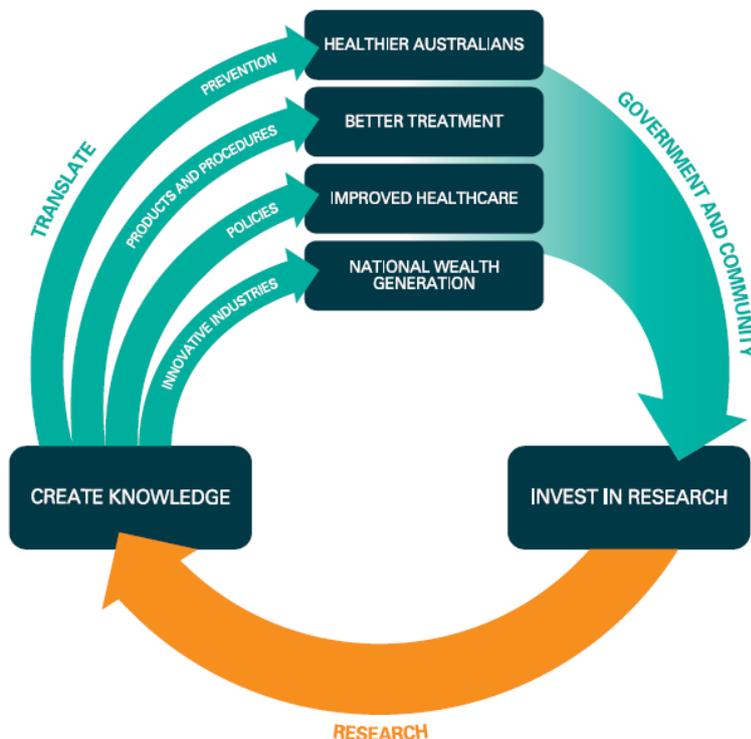
Translation of Research to Outcomes

Translational research is critical to ensure that the Australian population receives the greatest possible benefit from government investment in health and medical research. The Panel is of the preliminary view that translation can be better facilitated through closer relationships with clinicians, hospitals and health services. The Panel is also of the preliminary view that opportunities exist for increased commercialisation, through stronger sharing of resources and attracting investment by industry.

Investment in health and medical research is critical to improve the health of Australians. Submissions on the Issues Paper indicated that iMRIs in Australia are diverse organisations, undertaking a range of activities including both basic science and applied clinical research. The translation of research outcomes into practice, however, is an increasingly important measure of the quality of health and medical research.

The Panel considers translation to be an iterative process, where discoveries in basic research are translated into further knowledge, sound policy, and new drug options, devices and treatments for patients, all leading to better patient outcomes. Figure 5 further explores the concept of the ‘Virtuous Cycle’ of research. With iMRIs operating in an increasingly tight fiscal environment, it is critical that research is able to demonstrate this “line of sight” to improved patient care.

Figure 5: The ‘Virtuous Cycle’



Source: NHMRC Strategic Plan 2013-2015

The importance of translational research is acknowledged internationally. The National Institutes of Health (NIH) in the United States is one of the largest funding sources for medical research worldwide. The NIH has moved towards a focus on translational research, including recently establishing a National Centre for Advancing Translational Sciences to accelerate the development of effective treatments and cures following scientific breakthroughs. The Centre works closely with regulatory, academic, not-for-profit and private sectors. The Intramural Research Program was also established, to focus on the development of biomedical products and the commercialisation of research outcomes. Following this move by the NIH, the Cleveland Clinic in the United States requires that every research project demonstrate clinical implications.

In Australia, the NHMRC identified "Acceleration of Translation" as one of its three Priority Actions for the current Strategic Plan (2013-15). In 2012, the Research Translation Faculty was launched and, in 2014, the NHMRC invited organisations to apply for recognition as an Advanced Health Research and Translation Centre. These new Centres will exemplify excellence in research and the translation of evidence into patient care.

Around 25% of NHMRC funding supports the acceleration of translation, including two targeted schemes (Development grants for commercial translation, and Partnerships for Better Health for research aimed at improving health services). In most NHMRC schemes, funding advantage through its defined Selection Criteria is given to those who can demonstrate clinical, public health, health service or commercial translation.

Despite the focus on translational outcomes in Australia, as noted by the McKeon Review, there is still a tendency towards under-investment in translation due to the lack of economic return.¹⁴ The pathway to translation itself can also be expensive and difficult. NHMRC also reports that there is a disappointingly low level of interest in its Industry Career Development Fellowship.

Commercialisation

In the Panel's preliminary view, successful commercial translation is an opportunity to transform patient health care and improve health outcomes, and also reinvest money into the health and medical research sector.

The Panel notes that commercialisation of research outcomes is currently the subject of the Government's Industry Innovation and Competitiveness agenda, which aims to develop a strategy to improve Australia's economic performance through better translation of research into commercial returns. A Discussion Paper, *Boosting the commercial returns from*

¹⁴ The Department of Health and Ageing, 2013, *The McKeon review - Strategic Review of Health and Medical Research in Australia – Better Health Through Research* – p. 176

research, highlighted that Australia's health and medical research sector currently performs poorly in innovation and industry partnerships.

As previously outlined in this paper, iMRIs need to consider developing stronger partnerships with industry. They may also benefit from the Government's Entrepreneurs' Infrastructure Programme and Industry Growth Centres Initiatives, which aim to attract private sector/business investment in commercialisation and encourage commercialisation through competition.¹⁵ The Initiative includes funding to address financial barriers that exist in the early stages of commercialisation.

Challenges for the sector

- The "valley of death" – the initial gap between discovery and the development of a commercially useful application - is a key barrier to commercialisation, requiring the agreement and support of many players, and sometimes the implementation of significant policy, system or funding changes. Issues that may need to be addressed when considering this include: the potential impact this may have on accessibility to funding, and the change in focus within the public research sector from research outcomes and citations to commercialisation outcomes.
- The sector needs agreed measures for translational impact – There is work occurring at many levels across Australia and internationally to increase the translational effectiveness of research. These have identified many potential measures that need to be further refined.

Translation of research is critical to ensure that the population receives the greatest possible benefit from investment in health and medical research.

Next Steps

The Panel invites submissions from iMRIs and the wider health and medical research sector and the community in relation to their views on the key areas of long-term sustainability, efficiency, collaboration and translation of research outcomes.

The Panel also encourages universities, hospitals and health services to provide submissions on what role they might play in boosting the long-term sustainability, efficiency, collaboration and translation of research outcomes of iMRIs.

Submissions will inform both the targeted workshop and the Panel's Final Report, to be provided to the Commonwealth Minister for Health in late March 2015.

The deadline for submissions is **midnight Sunday 22 February 2015**.

¹⁵ Department of Education and Department of Industry, 2014, Boosting the commercial returns from research, (p.17-18) Available online <https://education.gov.au/news/discussion-paper-boosting-commercial-returns-research-released>

Due to the timing of the workshop, no extensions will be granted for submissions. However, submissions that are received after the closing date will be considered by the Panel in the preparation of its Final Report.

Appendix A – Issues Paper Analysis

Submissions to the Issues Paper and Business Model templates closed at midnight 7 December 2014. The Panel received submissions from a total of 54 different stakeholders. Of these stakeholders, 38 were iMRIs, five were peak bodies, six were universities, one was a state government department and four were other bodies. Overall, these 54 stakeholders provided:

- 48 submissions on the Issues Paper, and
- 31 completed Business Model Templates.

A summary of key themes that emerged from submissions is provided below.

Opportunities for Efficiencies

Best practice models

There is no one ‘best-practice model’ for iMRIs

The majority of responses indicated there should not be a “one size fits all” best-practice model for iMRIs. Generally, respondents agreed that iMRIs had developed diverse business models that reflect the diversity and complexity of the research environment and the research questions being addressed.

Strong collaboration with other institutions

Many responses identified that strong collaborative links with universities and other iMRIs was a key element of good practice. Respondents suggested that links with universities and other iMRIs could work to improve access and appropriate utilisation of research equipment, and access to PhD research students.

Co-location of Institutes with clinical setting

A number of submissions also highlighted the importance of co-location with universities, hospitals, and other clinical settings. Some respondents suggested that the co-location of researchers, clinicians, patients and project managers would create a more efficient system which translated research findings into health care and positive health outcomes more quickly.

Optimal size of iMRIs

No optimal size for iMRIs

The majority of responses received by the Review took the position that there was no one optimal size for an iMRI, and that size was best seen as a function of the breadth and type of research activity to be undertaken. Submissions emphasised that the performance of iMRIs should be measured by quality research output and by translation of findings to improved

clinical practice, and pointed out that analysis by AAMRI had shown no correlation between these key metrics and the size of an organisation.

A small number of submissions suggested an optimal size range for iMRIs (all of which fell within the wide range from 100 to 800 FTE staff) but a broader consensus on size or size range did not emerge from the submissions.

Small scale iMRIs can be more flexible and more responsive than larger ones

A number of submissions observed that small scale iMRIs could achieve a degree of flexibility, nimbleness, and responsiveness that larger organisations could not. A number of submissions acknowledged that very small iMRIs would have difficulties with long-term sustainability, in terms of attraction and retention of suitably qualified research staff.

Long term viability is linked to critical mass

Many of the submissions explored the concept of a 'critical mass' which was required to provide administrative and facilities support, attract funding from government and philanthropic sources, and achieve the long-term stability and sustainability required to see scientific discoveries effectively translated into clinical outcomes.

Ideal size relies on balance

A number of submissions suggested that an optimally sized iMRI would strike a balance between flexibility and viability, while avoiding bureaucratisation on the one hand and shortfalls in funding and support on the other.

Addressing the issue of disadvantage in comparison to overseas counterparts, submissions noted a range of disadvantages faced by Australian iMRIs. The most significant of these was generally agreed to be lower-than-required funding for infrastructure and back-of-house support, although differences in national approaches to, and perceptions of, philanthropy, arrangements for government funding, and access to international capital markets and opportunities for commercialisation were also raised.

Efficiency and avoiding duplication

Collaboration not competition

Submissions also highlighted the importance of co-location with like-minded institutes. Some respondents suggested that the co-location of researchers, clinicians, patients and project managers would create a more efficient system which avoided duplication and translated research findings to health care and outcomes more quickly.

It was suggested that co-location would also facilitate the sharing of costly fixed overheads such as support services (i.e. HR, IT, finance etc.), equipment and facilities. Submissions suggested sharing inventories of research equipment with researchers in geographical proximity to improve access to and utilisation of potentially expensive but vital infrastructure.

Diversity of funding

Stakeholders identified that they received a mix of funding from government, commercial and philanthropic sources. While some indicated that it is important that institutes maintain their charitable status for the continuation of philanthropic donations, others stated that there were efficiencies to be found by combining their resources, or using the size and reach of a university partner, to undertake a more targeted philanthropic drive.

Many submissions suggested that government funding grants need to be expanded to include elements currently outside the scope for funding, such as funding for indirect costs, and allowing funding for research in the enabling sciences.

Opportunities for Collaboration

Benefits and Barriers to Collaboration

Academic and financial opportunities

Many submissions indicated that collaboration between iMRIs and universities can be crucial to give researchers access to other disciplines that are required to support the research process, including mathematics, big data, engineering and ICT. Co-location can provide iMRIs with access to equipment that might otherwise be unattainable, and provide cost savings through shared services and facilities.

Disincentives to collaboration

While all submissions acknowledged the advantages of collaboration, some suggested that exploring and formalising collaboration between iMRIs, universities and hospitals takes undue time and resources, reducing the benefits to the parties. The structure of some funding also provides a disincentive to iMRIs to seek these formal collaborations, as there can be a loss of some support funding and access to funding streams. There were suggestions that smaller iMRIs may find it difficult to attract and negotiate useful collaboration opportunities.

Models for Collaboration

Local models

Many submissions endorsed the strategic research alliances established through the NSW Health 'Research Hubs', and NHMRC's emerging Advanced Health Research and Translation Centres. These partnerships were seen to have the potential to enhance links between iMRIs and universities, health services and industry, providing research bodies with easy access to research partners, while maintaining their independence.

International models

Several submissions indicated that international collaboration is required for Australian research to remain competitive and relevant. Some submissions indicated that iMRIs have a focus on collaborations within South-East Asia. The submissions indicated there were opportunities in the region through student and researcher recruitment, new public sector

funding and new sources of private sector research support. International collaborations also provide the potential for Australian-based researchers to leverage international research funding pools.

Facilitating Collaboration

Funding

Several submissions indicated that the structure and guidelines around some funding streams created a disincentive to forming formal collaborations. Submissions suggested that these disincentives could be minimised by alteration of the funding, especially with regard to the financing of indirect costs. Few submissions indicated that a positive financial incentive (beyond the potential for reduction in avoidable costs) was required to influence collaboration.

Support collaborations

Researchers and institutes need to build and maintain a profile both nationally and internationally to attract strong collaborations. Some submissions suggested that this can be aided by further developing funding mechanisms both to attract noted researchers and to support Australian-based researchers to participate in international exchanges and collaborations.

Opportunities for the Future – Impact and Translational outcomes

Translating research into health outcomes

Strong links and/or co-location between clinical setting and research institutes

Many submissions identified that close collaboration with both hospitals and universities increases the likelihood that research findings will be directly translated into health care and improved health outcomes. The presence of clinician-researchers provides an impetus for implementation of evidence-informed practice in clinical settings. It was highlighted that a scarcity of resources for research, policy and implementation in public hospitals can threaten successful translation.

Advanced Health Research and Translation Centres

Several submissions highlighted the usefulness of the NHMRC initiative to identify Advanced Health Research and Translation Centres. This program aims to “...recognise leadership in innovative discovery research, research translational activities, the provision of health care and the training of doctors, nurses and other health professionals in an evidence-based environment, at international levels of excellence’.

Build capacity

Teaching and training

A number of submissions suggested that the relationship between iMRIs and universities is crucial to maintaining training. There is a need to induct younger researchers and some stakeholders suggested that iMRIs can provide a unique learning experience. However,

there were opposing opinions on the roles and levels of responsibilities that iMRIs should take on for training researchers.

Workforce

A number of submissions highlighted workforce issues, suggesting that larger iMRIs should be funded for workforce training in areas of need where they have specific capability. By providing research experience for clinicians, and building the capacity of clinicians to be actively engaged in research, translation from research may become stronger and more reliable.

Boosting commercial/fiscal returns

Timeframe to achieve commercial outcomes is long

Many submissions highlighted the difficulties for iMRIs to reach commercialisation, with the need to identify commercial opportunities as early in the research process as possible. It was suggested that training programs to improve commercialisation capacity would be beneficial. Commercialisation programs such as NSW's Medical Devices Fund were held up as models to follow.

Intellectual Property

A few submissions identified Intellectual Property (IP) as a barrier to commercialisation. Submissions indicated that there was a low level of understanding about the IP process, and the protections of IP for iMRIs. Closer collaboration with industry and universities was suggested as a possible solution to these problems for iMRIs.

Measuring impacts

Clinical impact - contribution to change in clinical practice

The majority of responses indicated that evidence of clinical collaboration, training of doctors and converting research findings into improvements in clinical practice should be a part of outcomes reporting to measure success. This includes measurement and reporting of: policy impact; new clinical programs; adoption of new models of care; changes to current practices; development and use of guidelines, tools and resources. Other more traditional "track record" measures suggested include:

- Levels of grant income
- Awards and prizes, editorship of major journals
- Invitations to international conferences
- Number of Higher Degree Research candidates
- Completion of PhDs
- Progress of research to the clinical trial stage
- Registration of patents, licencing agreements or IP

- Glasgow RE-AIM model – A framework designed to enhance the quality, speed, and public health impact of efforts to translate research into practice in five steps:
(Reach your intended target population, efficacy or effectiveness, adoption by target staff, settings, or institutions, implementation consistency, costs and adaptations made during delivery and maintenance of intervention effects in individuals and settings over time)
- SCImago Institutions Ranking - A science evaluation resource to assess worldwide universities and research-focused institutions.

Appendix B – Suggested Reporting Methodologies

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1. Financial Reporting

Overview

The effective assessment of long term sustainability of iMRIs requires the collection of useful and comparable financial information across the sector. Once this information is collected a standard of sustainability benchmarks can be set across the sector.

The diverse nature of the medical research sector, added to variability and complexity of financial and operational information reported by individual iMRIs, currently limits the identification and comparability of long term sustainability indicators.

To address these limitations, an on-going system and framework to monitor the financial and operational information at iMRIs should be developed around a standardised reporting framework. Such a framework would enable iMRIs to;

- update annual audited and budgeted financial information into a standardised format.
- use the information within their organisational reporting as an internal management tool, allowing for quarterly and half-yearly reporting with KPI's automatically calculated.
- allow for information to be collected and categorised by funding bodies so that it can be compared and benchmarked.

Design

Development of standardised reporting template should be developed around two main principles:

- to allow for the variances in the iMRIs operations to be clearly identified thus creating unbiased comparison groups, and
- to not burden institutes with additional reporting not already undertaken by them.

The variances in the institutes operating structure and financial performance maybe driven by various factors such as:

- Research stage difference – Research activity occurs in various stages of a research cycle and has differing impact on the costs and revenues generated within an institute. Further, the measures that define success vary between the stages, for which the template must account.
- Clinical area of research – Institutes may focus their research within particular clinical areas that have differing cost variables such as requiring specific work area requirements, or staff skills. These differences must be captured to conduct an equitable analysis of the institute's financial performance. We also note that the current Australian Research Council (ARC) reports annually on a range of research

outputs. For health and medical research the measures are categorised by major areas of clinical focus.

- Size/Structure of the institute – The critical mass, governing structure and the relationship of the institute to universities, other organisations and any influence on health policy through advocacy will impact the operational structure and key drivers of cost and revenues within the institute.

In the development of standardised financial reporting, it would be essential to leverage from the work of existing funding bodies, and iMRIs in the sector, to ensure minimal replication of administrative burdens on the sector.

The key areas of focus through the capture of financial and operational data from the institutes would be sustainability, transparency, and use of grant funding. The standardised template might capture the following information:

Financial

- detailed audited financial information relating to – Statement of Comprehensive Income, Statement of Financial Position, and Statement of Cash flows for the current period.
- debt schedule – interest/non-interest bearing debt, specific purpose/general debt, short term/long term debt.
- application of funding to infrastructure/capital expenditure.

Operational

- workforce information relating to – FTE mix (research staff, operational staff, students), FTE composition (directly employed, associated staff).
- research groups within the institute.
- meterage of operations (m²).

This information could be used to develop a financial evaluation template which includes the financial inputs generating various financial and operational indicators and ratios. The financial ratios may be grouped within the following key groups and provide a performance benchmark:

- financial viability.
- revenue performance.
- growth ratios - current performance and capacity for future growth.
- profitability .
- liquidity.
- cash flow dynamics.
- debt servicing capacity.

In addition the operational performance could be analysed based on indicators to measure:

- asset efficiency and performance.
- key expense margins.
- revenue per FTE.
- staff mix ratios, etc.

2. Operating Reporting

In addition to the annual financial milestone reporting, annual operations reporting might also be considered. The collection of this operating information would also be through a standardised template, as well as other documents including a copy of the Asset Register and the grantee institute's Annual Report

iMRIs might provide the following data through a standardised operating template:

- Workforce: Employment structure and organisation.
- Collaboration: Shared grants (e.g. with research hub partners), publications, international students and hub engagement.
- Translation: How the institution plans to translate the research into health outcomes and/or health policy.
- Strategic Plan: Demonstration of the institute's plans to improve research grant successes, leverage funds from other sources, publications, achievements, commercialisation and internationalisation.

Workforce

The information would provide an overview of the iMRIs workforce in relation to:

- Research staff employed – Research, Tech Support, Admin/ Management.
- Affiliated Research Staff – On Site, Off Site.
- Research students supervised by staff at the institute – On Site, Off Site.
 - Number of Students.
 - Number of students supported by MRSP.
 - Average Lab hours per week.

Collaborations

Research & Publications

The information would provide an overview of the institute's research capacity and publications within the reporting time period, including collaboration with domestic and international partners and the use of this research, through citations by the health and medical research community. The data collected could include:

- Title of Publication.
- Full Name of Journal Publication.
- Publication Type (Peer Reviewed, Non Peer Reviewed, etc.).

- Number of Citations.
- Publication Budget.
- Collaboration (if any) – National or International.
- Translation Category (Bench, Translation to Humans, etc.).
- Corresponding Research Project (if the publication directly related to a research project which is being provided a grant from the NHMRC).

Commercialisation

This information would provide an overview of the current commercial activity at the institute, and its ability to do so in the future. The data collected may include:

- Commercialisation Office (existence/liaise with).
- Estimated total expenditure of the Institute on Intellectual Property protection.
 - Patent applications.
 - Copyright prosecution.
 - Securing background IP.
- Commercialisation of Intellectual Property (Current period).
 - number of patent agreements.
 - number of collaborative patent agreements.
 - number of applications.
 - number of disclosures.
- Patent Income.
 - Institute's Patents.
 - Collaborative Patents.
- Number of patents filed.
 - Australia.
 - International.

Translation

The information would provide an overview of the institute's ability to translate the research into health outcomes and/or health policy. The information to be collected could be used to analyse the level of translation of research policy into practice and how the institute is fostering translation and innovation from research. The data collected for the current research being conducted under the direction of the grantee institute may include:

- Number of Research Projects currently in various translation categories (Bench, Translation to Humans, etc.).
- Projected amount of Research projects in this stage at the end of next reporting period.

3. Financial and Operational Indicators

There are various indicators that are useful to evaluate the **Financial Sustainability** and **Operating Efficiency**. The below sections provide a synopsis of some of the key indicators and how they might be utilised.

Financial Sustainability Indicators

The financial sustainability indicators would measure:

- current financial performance (based on the Statement of Comprehensive Income)
- financial position of the institute (based on the Statement of Financial Position), and
- cash flow sustainability (based on the Statement of Cash flows).

The following table identifies potential outcome measures and the key Financial Sustainability indicators:

Table B1: Outcome measures and Financial Sustainability Key Indicators

Outcome Measures	Financial Sustainability Key Indicators
a. Ability to attract research grant income, and dependence on grant income	Operating Grant Income - % of Operating Revenue Growth in Operating Revenue (Net of Capital Grants)
b. Operating Profitability of the institute (net of capital grants)	EBITDA Margin (Net of Capital Grants) EBITDA (Net of Capital Grants)
c. Financial strength at the institute and its ability to meet operating/funding commitments	Working Capital Ratio Expense Cover Ratio (Incl. Cash & Investments) Growth in Total Assets
d. Cash flow adequacy at the institute and the management of its cash balance	Operating Cash Adequacy Ratio (Net of Capital Grants) Cash Flows from Operations (Net of Capital Grants) Creditor Days

Examples of graphs for each indicator are provided at Appendix B1

The above Financial Sustainability indicators can be utilised to analyse the following for example:

- compare the performance of the institutes for each specific indicator,
- measure variance of an institute's performance to the others, and
- to measure the performance of the institutes within the groupings based on the principles as outlined earlier.

Operating Efficiency Indicators

The operating efficiency indicators would measure:

- utilisation of the grant revenue within the research function.
- staff establishment at the institute.
- costs associated with the staff establishment at the institute.

The following table identifies the outcome measures and the key Operating Efficiency indicators:

Table B2: Outcome measures and Operating Efficiency Key Indicators

Outcome Measures	Operating Efficiency Key Indicators
a. Effective utilisation of the grant revenue within the research function	Grant Revenue per Research FTE
b. Optimal staff mix	Administration FTEs - % of Total FTEs Ratio - Students to Research Group Head
c. Staff costs at the institute	Staff Costs - % of Total Expenses Staff Costs per Type of FTE

Examples of graphs for each indicator are provided at Appendix B2

The Operating Efficiency indicators in Table B2 can be utilised to analyse the following for example:

- compare the performance of the institutes for each specific indicator,
- measure variance of an institute's performance to the others, and
- to measure the performance of the institutes within the groupings based on the principles as outlined earlier.

Productivity – Research Effectiveness Indicators

Internationally and in Australia there is difficulty in obtaining consensus on how to measure Productivity – Research Effectiveness of Medical Research Institutes, particularly due to the time lag relating to inputs and outputs and outcome that can take up to 20 years to eventuate. Often different researchers will be responsible for the inputs, compared to those producing the outputs and evaluating the ultimate impacts and outcomes of the research.

The table below highlights the critical outcome measures and some key performance indicators.

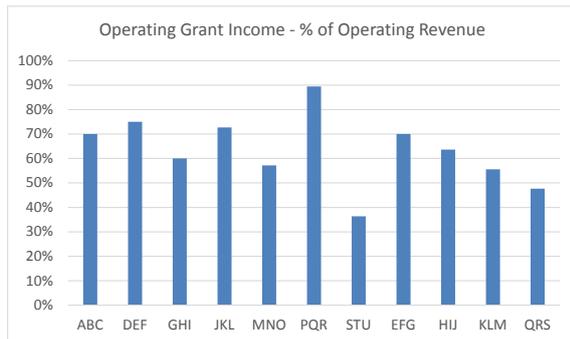
Table B3: Outcome measures and key performance indicators for MRIs

Outcome Measures	Key Performance Indicators
a. Attracting & maintaining high quality researchers	Staff retention (%) Staff turnover (%)
b. Knowledge production	No. articles in peer reviewed journals
c. Research targets & capacity building	No. PhD degrees No. post-doctoral positions No. citations Development of new models, new techniques, new delivery systems Collaboration with others Potential usefulness for clinical development
d. Informing policy & product development	Assay development, drug development – including feeding into drug development, clinical guideline development
e. Commercialisation	Licensing returns - \$ spent on licensing patents held by research organisation
f. External funding	External \$ brought in

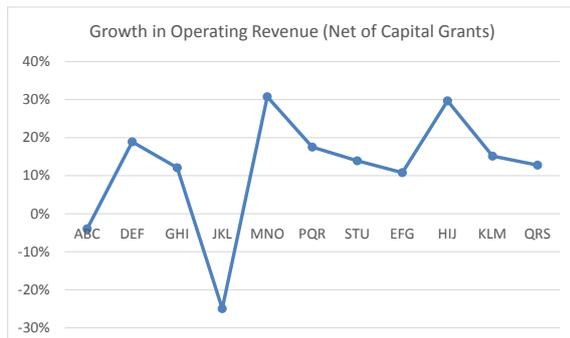
Appendix B1 – Graphs for Financial Sustainability Indicators

Please note that the information in the tables below is for illustrative purposes only. In no way does it reflect the financial performance of any iMRI.

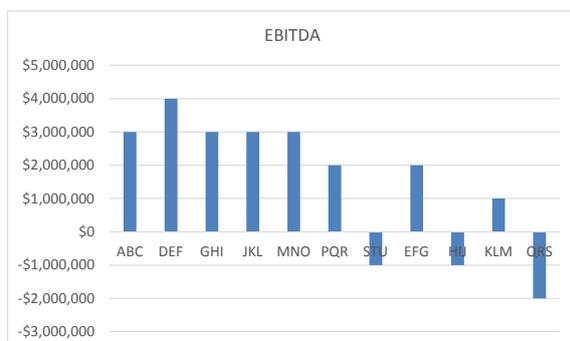
Operating Grant Income - % of Operating Revenue



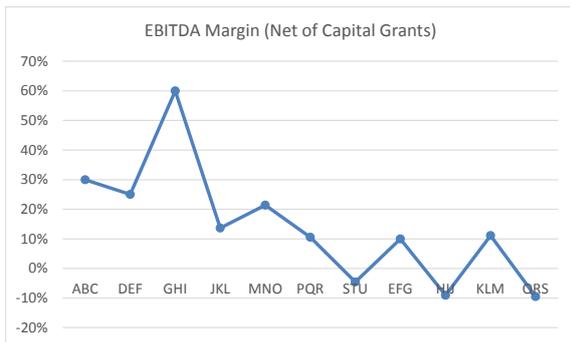
Growth in Operating Revenue (Net of Capital Grants)



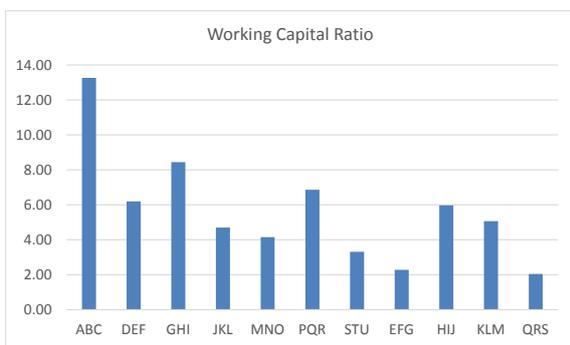
EBITDA (Net of Capital Grants)



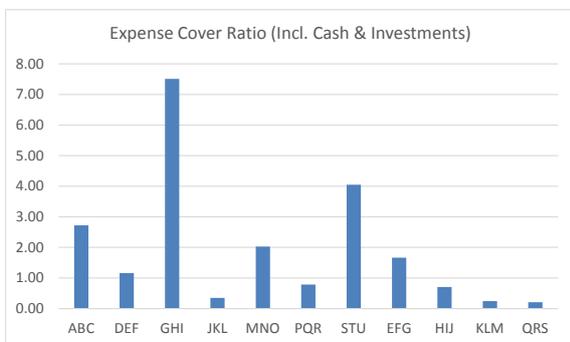
EBITDA Margin (Net of Capital Grants)



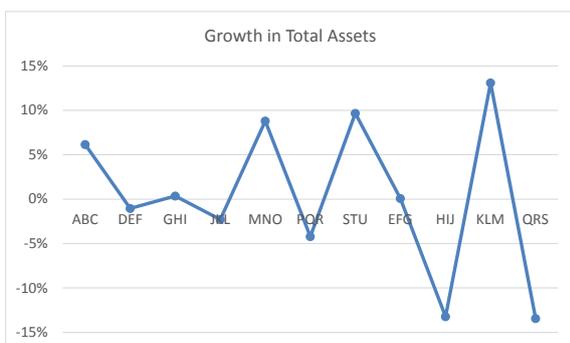
Working Capital Ratio



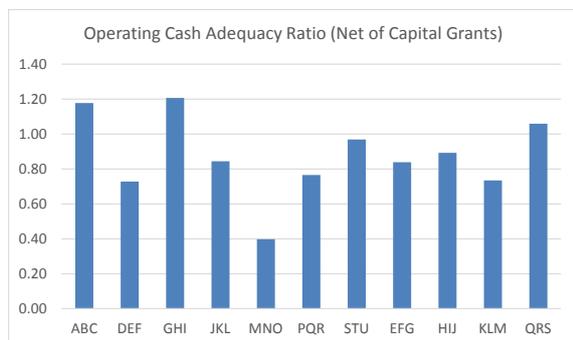
Expense Cover Ratio (Incl. Cash & Investments)



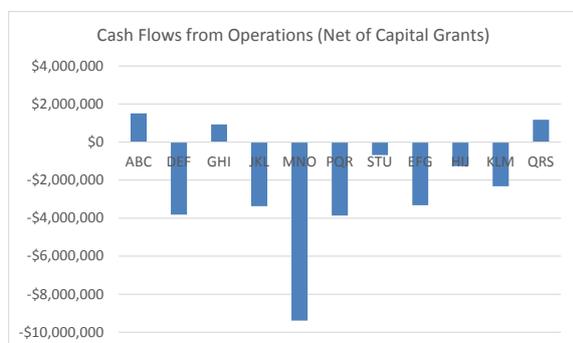
Growth in Total Assets



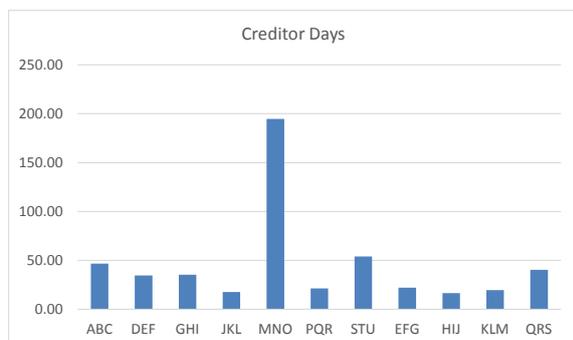
Operating Cash Adequacy Ratio (Net of Capital Grants)



Cash Flows from Operations (Net of Capital Grants)

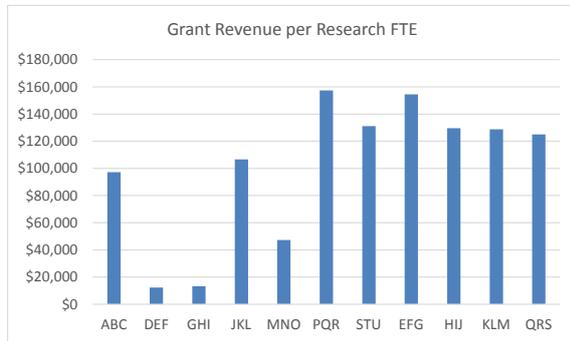


Creditor Days

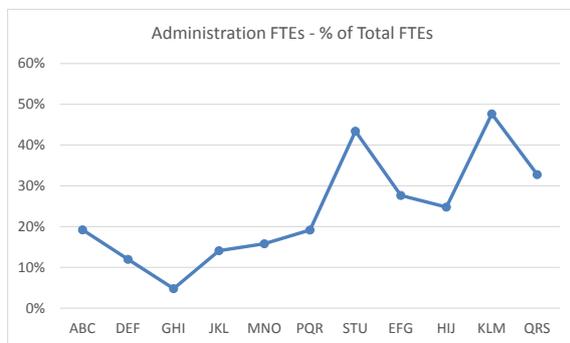


Appendix B2 – Graphs for Operating Efficiency Indicators

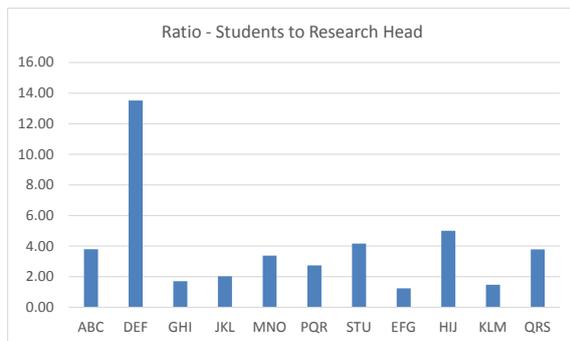
Grant Revenue per Research FTE



Administration FTEs - % of Total FTEs



Ratio - Students to Research Group Head



Staff Costs - % of Total Expenses



Staff Costs per Type of FTE

