AUSTRALIA’S MISSING LINK: A NATIONAL HEALTH AND MEDICAL RESEARCH STRATEGY

November 2021
FOREWORD

The COVID-19 pandemic has highlighted the strength of Australia’s health and medical research sector as well as its crucial importance to the nation’s future well-being. Australia’s public health response has allowed the nation to avoid the catastrophes other nations have faced, where hundreds of thousands of people have died from COVID-19. It is no accident that Australia has been able to mount such a strong response during this pandemic; it has been made possible by decades of investment in building up our health and medical research capability.
Over the last 25 years Australia has intermittently increased its investment in health and medical research. This has allowed the nation to deliver extraordinary health and economic outcomes along the way, including ground-breaking discoveries such as the development of the cochlear implant, the human papillomavirus vaccine, IVF treatment and the artificial heart valve, to name just a few. It has also delivered outstanding economic returns for the nation, with every $1 invested delivering around $4 in economic benefits, a return far higher than other government investments.

While the COVID-19 pandemic has shone a light on how Australia’s future success is intertwined with its health and medical research capability, it has also highlighted many systemic issues facing the sector:

• Investment in medical research is growing, but how this investment is being made has lacked national coordination. This is increasing inefficiencies in both how we fund medical research and how we ensure that we are investing in the right areas.

• The medical research workforce is highly talented but precariously employed, with little job security and limited opportunities for progression. Progress on tackling gender inequity has been too slow and produced too few results.

• Collaboration and cooperation between research and healthcare delivery remains fragmented, delaying the implementation of new and more effective treatments.

Left unaddressed, these issues will erode our future capability and leave us with a much less efficient and effective health and medical research system.

The Australian Government is delivering much-needed funding for on-going medical research, but the nation will not fully realise the benefits of this investment until an overarching and strategic approach to how we support and undertake medical research is developed. With the last major review of this sector, the 2013 McKeon review, undertaken nearly a decade ago, now is the perfect time to consider what needs to come next.

With substantial new government investment in the MRFF to augment existing investments through the NHMRC, there is now a golden opportunity for Australia to be among the world’s best destinations for health and medical research, to build new and sustainable career pathways, and to truly integrate research within the health system. The development of a national Health and Medical Research Strategy will identify Australia’s strategic advantages, as well as the areas where systemic barriers need to be broken down.

Through consultation with members and others in the sector, AAMRI has developed this position paper to set out the case for developing a National Health and Medical Research Strategy. In doing so it has identified opportunities for reform across the three key structural domains that underpin the sector: research, workforce, and funding.

Now is the time for all stakeholders in the medical research sector, including state and federal governments, research organisations, researchers, healthcare practitioners, health services, industry, philanthropy, and the end-users of research, to come together and develop a national strategy that ensures Australia has the world-class medical research sector it needs to address future health challenges.

As a starting point, this paper proposes an Australian Health and Medical Research Strategy focused across three key domains:

• Research: identifying research needs, aligning strategic investment, integrating research and healthcare delivery

• Workforce: developing sustainable and rewarding careers

• Funding: building coordinated and sustainable funding mechanisms

These areas are a starting point and other stakeholders will be able to identify their priorities. We are looking forward to the conversation developing and call on everybody with an interest in the future of Australian medical research to get involved and join AAMRI’s call for the development of a National Health and Medical Research Strategy.

Professor Kathryn North AC
AAMRI President

Professor Jonathan Carapetis
AAMRI Past-President
### SUMMARY OF RECOMMENDATIONS

**Develop a National Health and Medical Research Strategy**

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7. Establish a sector-wide approach to efficiently fund both the direct and indirect costs of research. |
The health challenges brought about by COVID-19 have dominated the headlines over the last 18 months, with more than 226 million cases globally and 4.6 million deaths as of September 2021. Australia’s rapid public health response, led by the health and medical research sector, has helped Australia escape the worst of the global pandemic so far. Thanks to the use of public health measures and the global development of vaccines, there is newfound optimism that the pandemic can be brought under control, and severe morbidity and mortality avoided across the population.

While the pandemic may have been at the front and centre of our thoughts, other significant health challenges remain, some of which have been made more acute by the impact of COVID-19. The nation was already facing an epidemic of poor mental health, with 1 in 5 people suffering from mental illnesses. More than 3 million people are predicted to have diabetes by 2025. For the first time in history, this generation of children are expected to live shorter lives than their parents, due to the “modern epidemics” of obesity, cardiovascular disease, diabetes, allergy, and mental illness, all of which have their antecedents in childhood, and are worsened by disadvantage and the socio-economic impact of the pandemic. At the other end of the age spectrum, half a million people live with dementia, with the condition set to become the leading cause of death within five years and affect more than one million people by 2058. Climate change is projected to result in increased communicable disease transmission, trauma, and mortality.

The health challenges that face us are considerable and only a research-led response will provide the tools needed to mitigate their impact. The Australian Government has increased its investment in medical research and readiness for this challenge. However, strategic coordination of this investment is needed to ensure research gaps do not emerge, duplication and waste are avoided, and we have a world-class workforce ready to respond to the research needs of the nation.

COMPOUNDING HEALTH CHALLENGES REQUIRE A STRATEGIC RESEARCH RESPONSE
The successful research responses to the COVID-19 pandemic, both in Australia and globally, were possible because of a strong foundation of medical research investment over decades. This has included investment in discovery research, knowledge translation and a highly skilled workforce. This investment has allowed knowledge, expertise and collaborations built up over decades to be rapidly mobilised to develop new treatments, vaccines, modelling and public health interventions.

The response to the COVID-19 pandemic has demonstrated the amazing impact of health and medical research when resource constraints are removed, and collaborations are able to flourish with research, industry and government working towards a common goal. The acceleration of medical research in response to the pandemic was unprecedented and holds many lessons on opportunities to better enable research to respond to health challenges.
Despite government and non-government investment in medical research totalling around $6.3 billion per year, there is no overarching strategic plan for how this investment could be most effectively used. There is little evaluation as to whether Australia’s health and medical research efforts are in-line with its future health needs. There is an absence of strategic coordination between leading funding agencies regarding their respective investment responsibilities. There is duplication of funding efforts in some areas, and chronic underinvestment in others. Despite resources and capability, the journey along the research pipeline from discovery to better health outcomes remains persistently blocked.

While the sector’s response to the COVID-19 pandemic has highlighted enormous strengths and opportunities, it has also exposed significant systemic issues around research capability, workforce and funding that impair the sector’s capacity to respond to increasingly complex health challenges. Identifying the strengths that can be built on and the weaknesses that need to be overcome is an urgent task that must be guided by a comprehensive health and medical research strategy. Left unaddressed, opportunities will be lost, inefficiencies will hinder progress and Australia’s place as a leading medical research nation will flounder.
A national strategic plan is needed for health and medical research which should focus on three priority domains: research capability, workforce and funding.

We need to understand our future health needs and the research required to respond. We then need to assign responsibilities to ensure this research progresses along the pipeline from discovery to new therapies, drugs, medical devices, improved clinical practice and health system changes.

The highly skilled and talented medical research workforce is one of our greatest assets, and yet the career pathways and labour conditions that we expect them to work within are precarious and demoralising.

The Australian Government is investing new funding in health and medical research through the MRFF, in addition to existing investments through the NHMRC and other agencies, and State Governments are independently contributing substantial research funding in specific areas. The opportunities to deliver outstanding health and economic outcomes for the nation have never been greater, but the structures we put around this investment are fractured and inefficient, holding back our potential.

Each of the three priority domains is briefly explored below to highlight the ways in which a national strategic plan for health and medical research could bring greater coherence and efficiency, and ultimately better health outcomes.
Absence of coordination between funders

The Australian National Audit Office recently found that there was an absence of coordination of responsibilities between the two largest government funders of medical research, the NHMRC and the MRFF. Despite $6.3 billion being invested in medical research each year from federal, state, not-for-profit and commercial sources, there is no overall strategic approach that informs how this investment is being made. This absence of coordination is leading to an unnecessary duplication of effort. Rather than offering complementary funding investments in different disease areas, or different parts of the research pipeline, each is operating without sufficient regard for the other.

Given that the NHMRC is a “bottom-up” research funder, supporting the best investigator-initiated applications and the MRFF is a “top-down” research funder seeking researchers who can respond to identified priorities, there is a potential natural synergy. However, the two funding bodies develop their strategies independently and there continues to be an overlap in responsibilities. Not only does this potentially lead to gaps in the research pipeline, but it also results in a duplication of effort as researchers are forced to “shop their ideas around” to multiple funding schemes. Now that the new co-Chair of AMRAB has been appointed as Chair of the NHMRC Council, there is a great opportunity to increase strategic collaboration between the two chief funders of medical research.

Strategic alignment of priorities between the NHMRC, the MRFF and other funders of medical research would ensure end-to-end support throughout the research pipeline and increase confidence from the medical research sector, industry partners, philanthropy, and investors.

Coordination between funders will lead to better information and analysis of whether the right areas are receiving appropriate levels of investment or where future strategic investments should be directed. It will, in turn, encourage focused efforts such as the establishment of purpose-driven collaborative networks in priority areas. Alignment of complementary strengths and capabilities across the ecosystem will enhance the ability to leverage funding from multiple sources. A national strategy will allow more innovative research to be undertaken and encourage more collaborations between researchers and industry, resulting in greater translation and commercialisation of research.

Research and health systems operate as separate entities

With some notable exceptions, the research and health systems operate as separate entities. Better integration of research and healthcare, along with co-investment from state and federal governments, will enable the delivery of better patient outcomes. Disease management and prevention can be informed by the latest research developments, and, in turn, research questions can be devised that more accurately reflect the needs of the health system. Integrating research into public health will improve preventative health, while research into health systems will help deliver more efficient health care.

Australia’s research capability and capacity to improve health outcomes could be made much more effective by better embedding research within the health system.

A national health and medical research strategy could go beyond identifying the well-known systemic barriers that stand in the way of integrating research with healthcare delivery and develop a whole-of-sector plan that moves beyond the piecemeal and fragmented efforts undertaken to date.
Job insecurity and lack of sustainable career pathways

Australia is home to globally respected and recognised research leaders as well as a highly trained health and medical research workforce. A 2016 report, commissioned by the Australian Society for Medical Research, demonstrated the exceptional health and economic returns of investing in Australia’s productive and talented research workforce of both home-grown and international talents. Despite this, Australia’s medical research workforce is hampered by short-term job insecurity and a lack of sustainable career pathways.

Systemic issues include declining success rates in the NHMRC grant program (particularly the Investigator grants, which have historically been a major source of stable salary support), along with the lack of sector-wide career path opportunities, and insufficient progress in gender equity and diversity. Success rates for competitive grants have plummeted in recent years, sometimes to below 10%. The ability to progress a career through the well-trodden NHMRC route has become more difficult, with opportunities for mid-career researchers being particularly limited.

Opportunities for careers in industry are also more limited in Australia compared to other nations.

Fundamental changes in how research careers are supported need to be addressed in our national health and medical research strategy, via a national health and medical research workforce plan.

Without significant change, medical research will not be a career of choice for the next generation of our best and brightest minds. We also risk losing many of the most talented early and mid-career researchers currently in the workforce. Research by Professional Scientists Australia show that more than half of the respondents expected to leave the health and medical research sector within the next five years.

When a highly skilled medical researcher leaves the research sector, around 20 years of investment in dedicated training and expertise is lost. The loss of these researchers adversely impacts the Australian medical research landscape, with the loss of knowledge delaying the development of new therapies and treatments. Critically, it leaves Australia severely exposed to future health challenges.
FUNDAMENTAL CHANGES IN HOW RESEARCH CAREERS ARE SUPPORTED NEED TO BE ADDRESSED IN OUR NATIONAL HEALTH AND MEDICAL RESEARCH STRATEGY, VIA A NATIONAL HEALTH AND MEDICAL RESEARCH WORKFORCE PLAN
Continued gender inequity

The continued gender inequity in medical research careers is illustrated by the high proportion of women in more junior roles, which falls dramatically as seniority increases. Despite the overall medical research institute workforce being almost two-thirds women, the inverse is true of the most senior researchers, as shown in Figure 1. Within the NHMRC Investigator Grant program, despite the total number of applications from male and female candidates being roughly the same, male applicants were more likely to be funded, and received larger amounts of funding. In the most recent round, male applicants were awarded more than 61% of funding. This pattern has persisted for years.

Existing pressures such as caregiving and non-research workload fall disproportionately on women, who are often early and mid-career researchers. The COVID-19 pandemic, public health interventions and the associated economic downturn are now significantly exacerbating the structural factors that drive this workforce inequity. This loss of productivity will cause women and early and mid-career researchers to leave the medical research workforce in disproportionate numbers in coming years, as they are less able to secure incredibly competitive research grants – already a major source of attrition in the workforce.

Figure 1: Gender split of the medical research institute workforce as of 1 July 2019. Source: AUSTRALIAN MEDICAL RESEARCH INSTITUTES – THE AAMRI REPORT 2020, Association of Australian Medical Research Institutes

The national health and medical research workforce plan should prioritise gender equity, sustainable career pathways for our researchers (both within medical research and beyond), novel funding mechanisms for a range of research careers and systematic training in consumer involvement, translational, and entrepreneurial skills.

The plan should also examine the retention of researchers, flexibility around career breaks or part-time work, increased flexibility of track record definitions and contributions required to enable an end-to-end research pipeline. Critically, it would include mapping of our future workforce needs.
Erosion of clinician research capability

Clinician researcher capability in the workforce is critical for the delivery of a research-embedded health system. The difficulties faced by clinicians who wish to be active researchers continue to hold back the potential for research to transform health outcomes. The tight budgets of hospitals and health services leave few resources to support research, providing limited opportunities for clinician engagement. Despite some relatively small interventions, opportunities to develop a career as a clinician researcher are limited and occur more through chance and persistence than in response to any strategic intervention.

The national workforce plan for health and medical research would identify priority actions across governments to build a clinician researcher workforce.

Enhancing career pathways requires increased workforce mobility between academic, clinical government and industry research settings. This will provide additional career pathways for medical researchers and help create ongoing and beneficial links between different sectors. Achieving this will require the revision of traditional indicators of success and the re-balancing of grant programs to acknowledge and welcome more diverse medical research career pathways.
Australian health and medical research has been supported through decades of investment by government, philanthropy, and industry. Public research funding is a significant resource, with substantial public funding from the MRFF, NHMRC and various state government investments. Unfortunately, while resources are being provided for health and medical research, they are not deployed efficiently for the most effective impact.

Chronic underfunding of direct and indirect costs of research

Competitive grants provided by the NHMRC, MRFF and other funders of medical research only cover part of the cost of undertaking medical research. Thus, research organisations must find the remaining funds needed to “top-up” underfunded grants. This leads to perverse outcomes where the more successful an organisation is at securing competitive funding through the NHMRC, MRFF and other funders, the more it is financially penalised.

In addition to the persistent underfunding of research grants, inadequate support is provided to cover the systemic (indirect) costs of research. These are expenditures that are critical for the undertaking of research such as operational and infrastructure costs (e.g., IT, commercialisation, legal), and professional and support staff. The NHMRC partially funds indirect costs while the MRFF does not support any indirect costs.

An average of 56 cents is required to fund the indirect costs of research for every dollar of research funding, and this funding gap is expected to increase annually. The financial support schemes currently in place to support indirect costs of research are administered by different government departments and utilise different funding formula with different rules (Figure 2). This has caused considerable confusion and inequity across medical research institutes, universities, and hospitals.

Figure 2: The flow of funding through Australia’s complex research funding system.
An average of 56 cents is required to fund the indirect costs of research for every dollar of research funding, and this funding gap is expected to increase annually.
Organisations are currently forced to patch together additional funds to fill the gap using funds from philanthropy, commercial or endowment sources that could otherwise have been used to conduct novel research, expand workforce capability and job security, and pursue new initiatives. The pandemic has also caused a significant decline in charitable and philanthropic funding, as well as international student income, further straining the already stretched sector.

The flawed model for supporting Australian medical research is becoming increasingly unsustainable. The plummeting success rates for, and chronic underfunding of, competitive grants and the dwindling fraction of research support (indirect) costs being covered mean that institutions will either need to contribute much more to cover the costs, or they will have to contract and inevitably disappear.

**Mechanisms to fund the full costs of health and medical research while sustaining support for projects and researchers are essential for the sustainability of a world-class health and medical research sector.**

Almost every comparable research nation has more efficient and effective funding systems in place. The development of a national health and medical research strategy would allow for an examination of how funding systems that have developed in an ad-hoc fashion and are laced with inefficiencies could be reformulated. The National Institutes of Health (US), the Medical Research Council (UK), National Institute for Health Research (NIHR) and Horizon Europe (EU) have all recognised this and have adopted methodologies and policies moving much closer to full economic costing. A similar sector-wide approach, developed with input from all major stakeholders, would increase efficiency and reduce confusion and inequities.

**Inefficiencies in the funding system**

The medical research system produces significant wastage effort each year due to its competitive application processes. The funding structures set up by the various funding bodies require medical researchers to spend inordinate amounts of time chasing dollars rather than making discoveries. Each application takes around 38 days to prepare, and with researchers preparing multiple applications per year, millions of dollars of medical research time is diverted away from actual research. This system is compounded by derisory funding rates which see only around 13% of applications succeed.

A national health and medical research strategy must urgently develop new, innovative, and sustainable funding structures that underpin efforts to develop a sustainable research workforce, as well as ensuring the right balance of investment is made in areas of need.

These new funding structures should ensure maximum value is gained from Australia’s investment in medical research. The MRFF has a mandate to support bold cutting-edge research. It can, and should, offer new opportunities by moving away from old funding structures and by developing new funding structures that reduces application red-tape and support new career pathways.
MECHANISMS TO FUND THE FULL COSTS OF HEALTH AND MEDICAL RESEARCH WHILE SUSTAINING SUPPORT FOR PROJECTS AND RESEARCHERS ARE ESSENTIAL FOR THE SUSTAINABILITY OF A WORLD-CLASS HEALTH AND MEDICAL RESEARCH SECTOR
This paper has highlighted three domains where a National Health and Medical Research Strategy could have significant impact: research, workforce, and funding. Within these domains the report has highlighted seven strategic priority areas for initial focus. The proposed domains and priority areas are summarised in the following table.

### Develop a National Health and Medical Research Strategy

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However, there will be other areas that warrant further attention, and the development of the Strategy will provide all stakeholders with an opportunity to identify areas in need of strategic reform. Examples include:

- Streamlining of ethics, governance, and other regulatory processes to create a more efficient research system.
- Ensuring consumer and community involvement genuinely drives research.
- Encouraging a culture that supports entrepreneurship, risk taking, and bold science.
- Maximising capacity for the safe handling, analysing, and sharing of data.
- Supporting resource collaboration between institutions, different states, and with international partners.
- Increasing venture capital investment in medical research translation.

AAMRI will continue to reach out to the whole medical research sector to build support for developing a National Health and Medical Research Strategy. The development of a Strategy will only eventuate if there is consensus on the need for its development. We encourage everybody in the sector to register your support for the development of a National Health and Medical Research Strategy and contribute to its development.

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