

RESEARCH TRANSLATORS TO IMPROVE HEALTHCARE OUTCOMES AND BOOST THE ECONOMY: ADDRESSING THE WORKFORCE GAP IN HEALTH RESEARCH TRANSLATION

Key Messages

- 1) Successful delivery of beneficial impacts from the MRFF is threatened by Australia's lack of a workforce dedicated to translating research into improved health and healthcare.
- 2) Competing nations have secured impact from similar schemes by incorporation of funding for frontline healthcare staff to deliver research and translation alongside clinical duties.
- 3) Overseas exemplars demonstrate excellent economic return on public investment in such "Research Translator" positions, increasing inward industrial investment and growing high value jobs.
- 4) Up to 10% of the MRFF budget should support Research Translators focused on delivering priority impacts and coordinated across health service settings by our Translation Centres.

Summary

While the creation of the Medical Research Future Fund (MRFF) has greatly increased research funding, Australia still lags behind other nations in translation of research into improved healthcare and economic growth. Unlike Australia, competing jurisdictions (e.g. UK, USA and Singapore) have systematically invested in frontline health service clinical staff who drive research and translation in combination with clinical care. Such staff have dedicated funded time to involve consumers and stakeholders in all aspects of research and translation; to lead clinical, data, innovation and healthcare improvement research embedded in clinical care; to provide translational expertise for partnership with healthcare and industry; and to champion integration of research-driven evidence and innovation into healthcare to deliver "Better Health through Research" (1). Here we describe such staff as Research Translators and propose that funding such positions would plug a critical clinical workforce gap that threatens to inhibit delivery of many MRFF priorities. Health service staff with most of the necessary skills are available in our nation but the funded time to deploy their translational expertise is lacking. Funding for research translational activity must be separated from health service delivery as experience has shown immediate clinical need will often absorb funding from more long term goals, including the improvements in the efficiency, sustainability and quality in our health system. A further risk is the loss of economic benefit; if UK activity and returns on investment in such staff could be achieved in Australia in proportion to population, we would see clinical studies involving ~340k volunteers per year that deliver Gross Value Added (GVA) of ~ \$2.5bn and ~24,000 jobs. Industrial partnerships would deliver a net annual gain to healthcare (income plus savings on trialed medicines) of ~\$28k per participant. Research Translators are the missing link in our metropolitan, regional and rural health economies and would help bring the benefits of the MRFF to all Australians. Funding such staff should be a cross-cutting priority for MRFF and stakeholders. The greatly increased funding through MRFF if distributed as "business as usual" will be a lost opportunity in healthcare improvement, evidence based care and clinical trial activity. To best ensure timely translation of the increased research output, specific funding should be allocated to securing rapid and sustained impact through Research Translators.

Introduction

The Australian (Federal) Government has taken a world lead in policy innovation by creating the Medical Research Future Fund (MRFF). The Government has gone on to create an exciting vision for the MRFF, “life-saving and job-creating medical research”. Delivery of this vision requires the creation of a sustainable translational ecosystem that brings together consumers, health services and health researchers in collaborations that translate research into improvements in both health and wealth, working in partnership with industrial healthcare partners. If “translation” is understood as the conversion of one language into another then here it means moving a new concept from the language of research to that of healthcare delivery. Alternatively, if translation is understood as moving something from one place to another, then here it means relocation of a new discovery from a library or a laboratory to the clinic, the community and the company.

In competing nations including the US and UK, investments to secure the skilled staff time to translate health research have created efficient translational ecosystems, improving healthcare and attracting industrial co-investment. Overseas competitors now support a new cadre of expert staff who are embedded in primary and secondary healthcare and can concentrate in the long term on translating research into healthcare and healthcare businesses. Such “research translators” include, for example, dedicated consultant clinicians, nurses, allied health professionals, clinical laboratory staff, medical informaticians and experts in implementation, improvement, safety and quality. These individuals prove the relevance of research to their health service and champion its sustained adoption (Figure, see over).

Australia can rapidly secure and build the cadre of research translators that are crucial for success of the MRFF initiative by targeted investment in the network of National Health and Medical Research Council (NHMRC)-designated, MRFF-supported Translation Centres. Through national policy work together as the Australian Health Research Alliance (AHRA) (<https://ahra.org.au/>) these Centres have identified the current lack of sustained funding for research translator time in health services as Australia’s key impediment to successfully transforming health research into improved healthcare outcomes and economic growth.

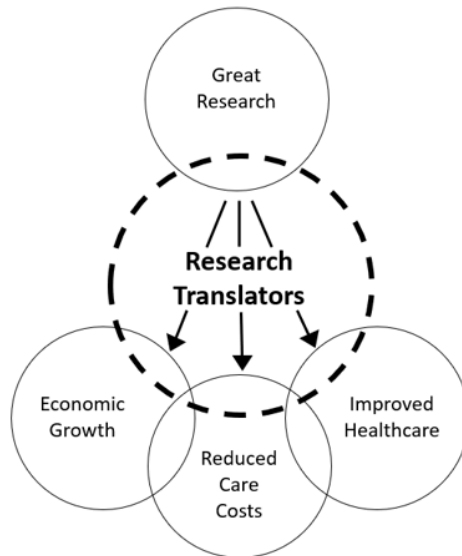
AHRA proposes that our Centres should receive and organise the financial support necessary to **broaden** the impact of the translational skill-set across the whole MRFF programme and to every part of the translational pathway, building on current MRFF funding to Translation Centres that promotes transition of “evidence into practice”. Focus on the whole pathway is needed because maximum impact of exciting MRFF discovery research programmes will depend on effective translation; and also because earlier stages in health research translation, particularly “discovery into clinical development”, are those most likely to lead to new intellectual property and the creation of new companies and new jobs. Furthermore, **deepening** the flow of MRFF support to Translation Centres to provide sufficient funding to embed expert health research translators in each Centre’s health service partners will secure a sustainable ecosystem for “life-saving and job-creating medical research”: Health services will have research translation staff with the skills and time necessary to support industry and other collaborative funders, including government, to achieve translation of research into health and wealth benefit. To be effective such funding should be identified and distributed distinct from both clinical care and existing direct research funding.

By drawing on international benchmarks, such as the \$10 per citizen per annum invested in research translators in the UK, it is proposed that an initial and significant increase in impact from MRFF investments could be ensured by investing 10% of the MRFF budget in securing research translators embedded in health services, approximately \$2.4 per citizen per annum. Such funding would be co-ordinated by Translational Centres and would be flexibly deployed to health services as needed to deliver MRFF priorities.

This workforce does not replicate the NHMRC investigator scheme which aims to “support the research program of outstanding investigators” who are largely embedded within research institutions and focused on delivering research excellence rather than translation, health system and health outcomes improvement. It does address the gaps left after the abolition of the Translation Fellowships by NHMRC. It also allows for a key workforce gap in implementation and health services research capability and capacity to be addressed. Less than 5% of NHMRC funding is currently dedicated to this field, despite 40% of healthcare being either low value (30%) or harmful (10%).

Figure:

Research Translators:
The missing link in the health economy



Research Translators:

- Serve as front-line members of all caring professions
- Involve consumers and recruit participants to research
- Provide industry with expert translational partners
- Prove the practical relevance of research to service
- Champion adoption of public and private innovation

1) Translation Centres – Large scale partnerships ideally configured to translate medical research.

Seven Advanced Health Research Translation Centres (AHRTCs) have been designated by NHMRC since 2015. AHRTCs are formally constituted partnerships that bring together, for the first time in Australia, the leaders of health services with the leaders of health research in Universities and Medical Research Institutes in structures that provide these leaders with highly valued input from consumers and other stakeholders, including industry and government(s).

NHMRC has also designated three Centres for Innovation in Regional Health (CIRHs), to ensure that populations in rural and regional settings have access to Translation Centres that also bring together health services, health scientists and consumers.

Both AHRTCs and CIRHs were established by NHMRC to address a particular problem in the Australian medical ecosystem- a failure to ensure swift translation of research evidence into routine clinical practice, exposing patients unnecessarily to poorer quality outcomes and reduced margins of safety. For example, even in specialist Australian centres, up to one quarter of total knee replacements are performed on candidates inappropriately selected according to evidence-based criteria, with a similar proportion of patients experiencing minimal clinical benefits from surgery (2). Other examples of low-value care abound in Australia.

The 10 Translation Centres are funded through partner contributions towards the lean co-ordinating team at the heart of each centre. The Centres also attract support for delivery of specific applied research projects from the MRFF Rapid Applied Research Translation program (\$2m per Centre per year) and a variable mix of State, philanthropic and industry sources. Funding of the critical research translation workforce remains our key gap.

Crucially, both AHRTCs and CIRHs are focused on identifying and responding to the research and translation needs voiced by consumers and health services, often in dialogue with federal and state governments. Translation Centres will undoubtedly deliver safer, higher quality care coupled with value-based healthcare and financial savings. However, these new organisations are also ideally configured to foster bidirectional translation of research evidence from across the research continuum, driving not only improvements in health, but also in wealth by stimulating the economy; they have the expertise to move discovery research into clinical and commercial implementation. Furthermore, Translation Centres have become a focus for identification and – where funding allows – assembly of the translational skill-set that will be crucial across the breadth of the ambitious MRFF programme if exciting medical research is to save lives and create jobs.

With guidance from the Commonwealth Department of Health, AHRA has identified priority policy areas for large scale national collaboration across Australia that addresses crucial gaps in the nation’s translational capability, AHRA’s National System Level Initiatives (NSLIs). Through wide consultation and careful analysis of the evidence base, the following priorities have been established:-

1A) Health Systems Improvement and Sustainability (HSIS).

A national framework for HSIS (3) was developed by a national steering committee informed by three working groups focusing on health services research, clinician engagement in systems improvement and economic evaluation of models of care. The initial focus has been on implementation science – bringing research evidence into routine practice – and the closely related discipline of improvement science, in which suboptimal performance or low value is detected and remedied on the basis of best available evidence; in a sense implementation and improvement are two sides of the same coin. Indeed, because improvement science deals with finding a rigorously-researched solution to a practical problem, this domain emphasises that translation is not merely unidirectional; there is frequently iteration between research, translation and need. A number of major deficiencies in our “research translator” workforce were identified including a lack of funded time in health services for healthcare professionals (clinical and managerial) to deploy skills and capability in the areas of implementation science and knowledge translation, economic evaluation of models of care and health technologies at the local/healthcare organisational level.

1B) Data driven healthcare improvement.

Without comprehensive care and outcome data neither improvement nor implementation is sustainable. Indeed, health data are crucial at every stage of the translational pathway. A National priority framework for data driven healthcare improvement was developed and has been recently published (4) describing the pressing need for a healthcare-embedded workforce with the funded time needed to deploy skills and capability in data literacy, visualisation and analytics and in artificial intelligence.

1C) Clinical research and clinical trials facilitation.

This NSLI is being developed in alignment with the Australian Clinical Trials Alliance (ACTA). The AHRA work has included identification of major unmet needs around funded workforce capacity in clinical trials, clinical cohorts and clinical quality registry conduct and delivery in keeping with the NSLIs above. Addressing these needs will allow Translation Centres to co-ordinate “factories” for research evidence generation and translation by improving organisation and delivery of 21st century clinical trials and related methods of assessing innovations in care, adding to the evidence base for better healthcare. In

turn, with appropriate support this work will improve access for all Australians to ground-breaking trials, and help to enhance the nation's \$1.1bn industrial trial activity.

1D) Consumer and community involvement (CCI)

Consumer and Community Involvement (CCI) AHRA commits to strengthening consumer and community involvement (CCI) in health research across Australia with consumers, community members, healthcare providers and organisations, researchers and research organisations working in partnerships, to improve the health and well-being of all Australians through health and medical research. We recognise that the design, conduct, benefits and translation of health research are significantly improved and enhanced by the involvement of consumers and community members throughout the research process. In 2018 AHRA launched its national CCI Initiative (Phase 1), conducting a baseline survey and environmental scan of current activities and resources to support consumer and community involvement in research. Four priority areas were identified for further development in Phase 2, which is now underway and is expected to be completed by June 2022:

1. Develop minimum standards for good practice in consumer and community involvement in translational health research
2. Facilitate access to, and sharing of resources and expertise to support consumer and community involvement in translational health research
3. Develop a framework for measuring the impact of consumer and community involvement in translational health research
4. Establish formal alliances with leading international agencies promoting consumer and community involvement in health research.

By participating in AHRA NSLIs and Networks, and by strategically deploying MRFF funding for rapid applied research translation, the Translation Centres have further strengthened their position as Australian leaders in efficient and effective translation of health research. Furthermore, their strategic competence is evidenced by the fact that an international lead has been taken in establishing nationwide "communities of practice" in the domains above, fostering effective translation right across the complex public/private, primary/secondary and hospital/academia interfaces that have rendered Australian healthcare inflexible and resistant to beneficial change. Indeed the AHRA Centres typically comprised of health service, University and Medical Research Institutes have translational expertise across a wide range of models of care, including those needed for remote and regional healthcare and for improving Aboriginal and Torres Strait Islander health, thus ensuring a pathway to patient benefit that serves all Australians.

In short, the Translation Centres and AHRA are the place to go if a national programme such as MRFF is seeking to ensure timely translation of research into primary and secondary care, whether metropolitan or regional. The Centres help "flip the paradigm" of traditional health research by translating new evidence through continuous and active engagement with service users, the community, frontline clinical staff and other stakeholders (5). Translation Centres have the membership, knowledge, networks and integration to provide best-value deployment of newly-funded research translator time and through AHRA can co-ordinate this into a national competitive effort. As experience has shown immediate clinical need will often absorb resources from more long term goals, funding for research translational activity must be separated from health service delivery.

2) International evidence supports the case to broaden MRFF support through Translation Centres to the whole translational pathway and the full range of MRFF programs.

Medical research in Australia is excellent value for money (6) with an overall benefit-cost ratio (BCR) of ~3.9 but, compared with competing economies, this encouraging multiplier masks under-performance in

the delivery of economic growth derived from commercialisation of research (7). Australian medical research delivers financial benefit at a ratio of 2:1 in favour of reduced health costs vs increases in GDP from commercialisation of research. However in the UK, for example, a broadly similar health research and innovation ecosystem delivers GDP gain approximately 4 times more efficiently with a 1:2 ratio for healthcare savings vs wider GDP spillovers (8,9). This reflects investments made by the UK, as for a number of competing nations, to address a key translational gap that hitherto has been out of scope for Australian Translation Centres - the barriers that prevent the translation of discovery medical research into clinical development and then health and wealth gain (10). Indeed, disruptive technologies such as genomics and machine learning are now being rapidly translated in the conducive health research ecosystems of competing nations across both gaps (discovery into development; and evidence into practice), but such rapid translation is not yet happening in Australia at the scale necessary to impact health and healthcare with the speed – sometimes only months - seen overseas.

Fortunately, however, Translation Centres already bring together two communities key to translating discovery into clinical development- health researchers and health services, providing a “one stop shop” for collaboration with innovative healthcare companies. Competing economies have deliberately formed constructs identical to Australian Translation Centres to foster early stage, commercially-directed translation of discovery health research into clinical development. A successful example is the National Institute for Health Research (NIHR) Biomedical Research Centre (BRC) initiative in the UK. For example, in UK financial year 2017/18, BRCs levered £1.148bn in external research funding compared with NIHR investment of £165.5m (equivalent to ~\$6 per citizen per year); supported 1,149 industry contract studies and 621 industry collaborative studies; filed 199 patent applications and had 237 applications granted; and generated £28.2m in revenues from exploitation of intellectual property to reach a total of £255.5m of such revenue with 67 spin-off companies winning additional revenue over the 8 year period from 2009/10 to 2017/18 (11).

Indeed, Australian funding for groupings similar in scope to BRCs would address one of the key weaknesses of the Australian Clinical Trials system. The 2017 MTP Connect Report (12) highlights a need for Australia to invest in developing capability in specialised, high risk and innovative trials to remain a leading trial destination. There is a particular opportunity to cater for industry interest in early phase translational trials in small groups of highly characterised volunteer patients, as provided in UK BRCs. Currently Australia has only ~4% of global industry funded Phase 1 studies vs ~13% in the UK.

Therefore, to ensure that Australia benefits from the most rapid translation of the increased flow of discoveries expected from the step-change MRFF investment and from the economic stimulus associated with commercialisation of such research, international comparisons mount a compelling case to broaden the mission of Translation Centres to the whole translational pathway, providing both federal and state governments with a new platform for generation of both health and wealth.

Furthermore, overseas initiatives emphasise the need to invest in translation hand-in-hand with research. For example, large recent multi-funder step-change research investments in the UK, such as the \$50m *pa* UK Dementia Research Institute and the \$50m *pa* Health Data Research UK have been closely aligned with NIHR BRC investments that secure the translational skills necessary for success. In the US, in 2011 concern over inadequate translation of research led to the National Institutes of Health establishing the National Centre for Advancing Translational Sciences as a ~\$500m per annum investment in securing translational skills in the US health research ecosystem. Thus, international precedents suggest that Australia’s step-change investment in medical research through the MRFF is most likely to achieve maximum impact if there is a co-ordinated investment in translational skills.

3) The case to deepen MRFF support through Translation Centres by funding dedicated Research Translators.

Australia can point to remarkable successes in “end-to-end” translation of health research that delivers both health and wealth. Examples include HPV vaccines that prevent cancer of the cervix in women, diagnostics for Helicobacter-induced peptic ulceration, devices such as cochlear implants and drugs such as Venetoclax. However, when the Australian ecosystem for translation of the health research is compared critically with that in competing economies, it can be argued that such successes are truly exceptional in that there has been very limited systematic investment in the skills necessary for translation. For example, in the UK, the National Institute of Health Research (NIHR), which has a budget equivalent to \$2bn per annum for the English population of 55m, invests about \$10 per citizen per year in maintaining a cadre of ~16,000 highly skilled research translation staff embedded in health services and expert in delivering translation across the whole pathway. In the US, where the total budget for the National Institutes of Health (NIH) is equivalent to \$60bn per annum and already delivers health research expenditure of over \$200 per citizen per year, an additional \$2 each year per citizen has been invested by the National Centre for Advancing Translational Sciences (NCATS; formed in 2011) to ensure a per capita investment in translational skills at least comparable to the UK.

So, is there evidence from overseas that a cadre of health service research translators would assist the MRFF in creating jobs? Support for a major investment in translational skills only became possible in the UK with the formation in 2006 of NIHR as a new funder of health research with a specific brief to translate. The economic yield from NIHR support of translational staff in the UK is impressive (13) because industry and other partners preferentially invest in medical research in the UK as they can be sure that a health service can deliver translational evidence through a dedicated workforce, whatever the pressures of patient care. The NIHR BRCs lever external collaborative funding from industry and other sources of \$6.9 for every \$1 invested in translation, although the skilled research translators needed to secure such excellent returns are a significant investment; for example each industrial study secured requires NIHR support of about \$93k per annum on such staff (13).

A holistic analysis of the total English investment of ~\$16 per citizen per year in clinical workforce time for research and translation does indeed confirm significant economic benefit and creation of high-value jobs (13). Scaled to the Australian population, the benefits are equivalent to GVA of ~\$2.5bn and ~24,000 jobs but would require participation in research at the UK rate of ~13,000 volunteers per million of population each year, about 340,000 people in Australia. While reliable data on research participation in Australia are elusive, it seems most unlikely that UK participation rates are matched in Australia, not least because the MTP Connect report on clinical trials identified low participant recruitment as another impediment to Australia becoming a world-leading destination for industry-led trials. This very high level of UK participation in trials and other clinical studies is what drives industrial trial acquisition by the UK, which provides the healthcare system with a benefit of ~\$28,000 per participant (the sum of income and savings on trialed medicines that are provided at no cost by the industrial sponsor). These benefits to the health economy in the UK are strong evidence to support Australian investment in Research Translator time.

4) What are the advantages of Research Translators embedded in health services?

Commonwealth and State governments currently invest a substantial proportion of GDP in workforce responsible for direct clinical care. Our governments also invest heavily in an innovation and change management workforce, but this is generally separated from the clinical care workforce within hospital Clinical Governance Units. Whilst tasked with supporting frontline services to deliver best evidence care and improvement, government reports and research have demonstrated that this approach has been

largely ineffective with limited impact on key measures such as better value care (14, 15, 16, and 17). The need to integrate robust research methods into healthcare improvement in a continually improving and learning health system is now clear and is an AHRA priority (18, 16). The clinical care workforce, on the other hand, is essentially "latent" in terms of systems improvement, but potentially highly relevant to research translation and thereby, to the necessary transformation in delivery of value-based care envisaged in the McKeon Review (1). The establishment of an embedded research translator workforce capability would fill this recognized gap in capability across translation and change management and mobilize our existing assets. Research Translators would support and empower both the clinical care delivery and change management workforce and produce a multiplier effect, allowing the current workforce investment by both the States and Commonwealth to be of greater impact towards the overall mission of the MRFF.

In competing health ecosystems, including the UK, US and Singapore, specific funding is provided to develop the skills and fund the time of Research Translators as employees of organisations delivering healthcare. The skilled groups include doctors, dentists, nurses, allied health professionals (radiographers, dieticians, pharmacists, optometrists, etc.), pathology technicians, medical informaticians, biostatisticians, clinical trial designers, implementation scientists, improvement scientists and experts in safety and quality. The work to date that has been undertaken across AHRA as part of our five NSLIs affirms the need to grow Australian capability and capacity in this domain of research translation.

How do such staff promote translation of health research? For example, one of the authors (J.S.) was involved in successful translation of research into a new cross-system care pathway for sudden heart attack (acute myocardial infarction or MI) now the standard of care in Edinburgh (UK): Patients with acute chest pain are attended by an ambulance, their ECG is telemetrically transmitted to the coronary care unit, an ECG diagnosis of acute MI is made and the ambulance team is instructed by its controllers to bypass the emergency department taking the patient for an immediate primary coronary intervention (such as recanalisation and stenting). This pathway ensures that pain and loss of heart muscle are definitively terminated in a median time from onset of pain of just under 90 minutes with the patient returning home soon after, a very dramatic improvement over the pre-existing pathway. To secure adoption of this pathway, time and evidence were required from research translators including ambulance paramedics, cardiac electrophysiologists, coronary care nurses, consultant cardiologists, biostatisticians and health economists. Not only did these professionals provide "proof of relevance", gathering key data to demonstrate that the proposed evidence-based changes would indeed work in the Edinburgh health system, but such research translators were also champions for the new care pathway, educating their fellow health service professionals in how to make the changes become a new, sustainable standard of care. Similarly, in Australia, another author (C.L.) pioneered, in 2008, the application of prehospital clinical stroke scale assessment at a local level in the Hunter Valley, NSW (19). This innovation provided, for the first time in both metropolitan and regional settings, evidence of a valid ambulance-based triage mechanism to help avoid delays in patients accessing reperfusion therapy for acute ischaemic stroke. Translation around this initial evidence has taken 9 years but has led to statewide rollout of this new model of prehospital stroke care in 2018. We propose that had there been ambulance and hospital based staff with expertise, capability and time to engage in knowledge translation, this lengthy delay could have been shortened substantially.

A third author (GG) in a series of studies on the impact of an oral steroid, dexamethasone, in childhood croup performed and published over a the period of 1993 to 2005 (20) lead to change in practice at Princess Margaret Hospital with a dramatic reduction in admissions (27% to 11%), total and average croup days on the wards, the Intensive Care Unit and in the numbers of children intubated. While in 1988 173 "croup days" were recorded in the ICU with 12 intubations, by 1995 this was reduced to 8 days

with no intubations. The total estimated saving to PMH was in excess of \$2.1 million per annum for an outlay of less than \$1000 for oral dexamethasone. It also demonstrated benefits for children with milder croup who were not hospitalised showing that using a quarter of the oral dose of dexamethasone originally recommended was just as effective, and that steroid usage reduced the representation rate from 15% to 2%. While publication of these studies and others have helped change practice worldwide so that steroid therapy for croup of every severity from mild to severe is now accepted this took many years to occur underlining the need for more active translation.

Another author (HT) as a clinician academic embedded in healthcare, has developed, established efficacy through randomized controlled trials in thousands of women and has now implemented healthy lifestyle interventions in pregnancy across Australia, Europe and South East Asia reaching thousands of women and influencing guidelines nationally and internationally. These interventions improve maternal and neonatal outcomes for women and the next generation and are cost effective resulting in substantive immediate savings in pregnancy from maternal complications alone as well as added benefits from reduction in non-communicable diseases.

So how could AHRA- and Translation Centre- supported research translators ensure delivery of the objectives of the MRFF? For example, the MRFF Cardiovascular Health Mission seeks to create “a world class ecosystem focused on break-through cardiovascular health research, underpinned by collaboration, innovation and commercialisation” (21). The Mission has identified exciting Investment Flagships, which in our view require that health services have research translation staff available if sustainable benefit is to arise from investment of \$220m in the Mission. Thus, the Mission’s proposed Precision Medicine Flagship will achieve maximum impact if health services have research translators available amongst their technical staff based in clinical laboratories, and their medical and nursing staff in outpatient departments. Similarly, the Bioengineering Flagship will achieve the desired step-change if health services have research translators amongst their surgical theatre staff and radiology department staff. Both the Data and Clinical Trials Flagships will achieve more if health services have research translators in their clinical information teams and research done as part of the Implementation and Policy Flagship will change care if research translators are available to prove relevance of the flagship’s outputs to their health service and champion adoption by their health services. Similar conclusions can be drawn for all 8 MRFF Missions, in which a total of \$1.38bn will be invested over 10 years. Indeed, research translators would provide crucial support to other MRFF initiatives such as the \$570m Frontier Health and Medical Research program.

5) Funding Research Translators would fit MRFF Principles and Priorities

We believe that funding Research Translator time would observe a number of the Funding Principles of the MRFF (22). This would clearly complement existing funding into health and medical research through a strategic top-down approach to investment (Principle 3). Furthermore, our proposals have collaboration, translation and scalability features to ensure the MRFF is transformative and effort is enduring (Principle 9). Indeed, where the MRFF is funding transformative game-changing research we believe that Research Translator funding represents a balancing investment in systemic sector improvements (Principle 14).

Furthermore, the majority of the 2018-2020 MRFF Priorities (23) would be much more securely achieved if Research Translators were available in health services. As explained above these Priorities would benefit:- antimicrobial resistance; global health challenges such as pandemics; Aboriginal and Torres Strait Islander health; ageing and aged care; digital health; comparing the value of different health interventions; support for health professionals to conduct their own research; identifying gaps where

research does not address the lived experiences of patients, and fixing these; using existing drugs for new purposes; and supporting Australian biomedical and medical device development.

6) Expenditure of 10% of the total budget on securing Research Translator time is required to ensure success for the Government's vision for the MRFF.

As described above, the Australian Government has seized international leadership in public investment into health research and translation by forming the MRFF, which adds about \$24 per annum per citizen to the health research ecosystem. Furthermore, the Government has developed an exciting vision for the MRFF, which will beneficially impact Australian society through “live-saving and job-creating medical research”. As argued above, the Government has shown considerable wisdom by making a long term investment, through the MRFF, in Translation Centres that bring together two publically-funded communities that are essential for delivering the vision – health services and health researchers. To ensure success for the vision of “saving lives and creating jobs” we argue that it is now essential to make a substantial investment in translational skills at the interface between care and research; not to do so confers a significant risk that exciting plans for MRFF investment to support national priorities will fall short of reaching their potential impact.

By pointing to international comparators (such as the substantial investments made by the US and UK in translational medical research capacity) we argue that the risks of failing to deliver on the vision for MRFF can be mitigated by reconfiguring MRFF funding plans to deliver investment in health service-based Research Translators across the ten existing Translation Centres that are well networked through the Australian Health Research Alliance (AHRA). This will empower for translation the ~80% of health services and ~90% of medical researchers (24) that are currently engaged with AHRA's constituent Translation Centres. The proposed investment in Research Translators would be co-ordinated across partnered health services by Translation Centres and deploy up to 10% of the MRFF budget to ensure that health services have available a cadre of experts skilled in translation, an investment comparable in scale per citizen to the UK and US. Such staff will have substantial part-time or full-time commitment to ensure that MRFF delivers its ambitious objectives, and that industry and other collaborative funders can also translate research into improved health and economic growth with greater reliability. Many of the skills are potentially available, but the securely funded time to deploy them is not, nor are the career development programs that are needed in some domains.

Because each AHRTC or CIRH brings together a number of health services within a single collaboration focused on translation, it is proposed that if MRFF is able to fund Research Translators these monies would be channeled through Translation Centres. These collaborations have the detailed knowledge necessary to achieve optimal allocation to local health service partners in a manner providing the most effective support of MRFF priorities, with a requirement that monies are spent by health service partners on research translator time (part-time or full-time as needed) and career development.

If there is support for the MRFF to fund this Research Translators initiative, AHRA would work with the Department of Health to ensure embedding of governance and distribution mechanisms that best suit the objectives of the MRFF. Thus, on the one hand the investment might be targeted to all regions regardless of the level of current research, to ensure that all Australians can benefit from MRFF translation funding. On the other, research translator support might be most effective if distributed in proportion to MRFF investment. The AHRA collaboration would ensure that distribution was acceptable to all stakeholders.

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