

Future Pathways for Health and Medical Research: an NZHR discussion paper

Overview

The government through MBIE has released its Te Ara Paerangi Future Pathways Green Paper¹ - a consultation document on a “multi-year programme focused on the future of New Zealand’s research system. The programme seeks to start an open and wide-ranging conversation on a range of issues facing the research system, how these issues might be addressed, and how to take advantage of emerging opportunities”².

New Zealanders for Health Research (NZHR) is New Zealand’s peak body representing the entire health and medical research pipeline. We are committed to bringing about best possible health for all New Zealanders, and we’re on a mission to increase investment in health research as an essential and embedded component of all parts of New Zealand’s health system, responsive to New Zealanders’ unique health imperatives.

Upon reading the Future Pathways Green Paper (FPGP) we wonder if health research has inadvertently become something of an orphan (possibly one of several) within New Zealand’s wider research, science and innovation (RSI) system, noting that it barely rates a mention in the FPGP, and that it has never benefited from the support of a unifying CRI. NZHR therefore welcomes the FPGP as an opportunity to contribute to the development of New Zealand’s research, science and innovation sector, and system, both as a whole and with a focus on health and medical research specifically.

Reflecting the FPGP’s aspirations for New Zealand’s research system as a whole NZHR wants to see a modern, future-focused health research system for New Zealand. “It needs to be adaptable for a rapidly changing future, resilient to changes, and connected: to itself, to industry, to public sector users of health research [including the health system], and internationally. Such a system will need to reflect New Zealand’s unique opportunities and challenges. It will need to embed Te Tiriti across the design and delivery attributes of the system, and enable opportunities for mātauranga Māori. It will also need to recognise that research is a global undertaking and seek to stand alongside the best systems in the world” (FPGP p19).

This discussion paper has been developed to frame up the content and programme of NZHR’s 22nd February online workshop³, where we intend that its contents will be further worked up to inform our formal submission to MBIE, now due by 16th March.

¹ MBIE 2021. Research Science and Innovation. Te Ara Paerangi Future Pathways Green Paper.

<https://www.mbie.govt.nz/dmsdocument/17637-future-pathways-green-paper>

² <https://www.mbie.govt.nz/science-and-technology/science-and-innovation/research-and-data/te-ara-paerangi-future-pathways/>

³ <https://nz4healthresearch.org.nz/health-research-and-te-ara-paerangi-future-pathways-green-paper-workshop/>

Feedback and discussion will be invited during the workshop, and comments are welcome anytime thereafter, but preferably before 14th March. As part of developing a final submission NZHR will draw on health research related submissions re MBIE's 2019 Draft RSI Strategy⁴, which have also been referenced in part in this paper.

Issues

The issues for health and medical research which NZHR believes should be considered in the context of the FPGP are:

1. Health and medical research priorities vis a vis other research priorities
2. Government and other health research investment levels, trends and trajectories
3. Design and structure of funding system and research institutions
4. Pathways to impact on health outcomes
5. Mātauranga Māori and embedding Te Tiriti in the research system
6. Workforce development
7. The place of existing frameworks and strategies
8. Other issues which promote or militate against an effective health and medical research system

Health and medical research priorities vis a vis other research priorities

The FPGP states that *“Government funding that supports research activities in New Zealand has increased significantly since 2010, by around 75 per cent. With it, the system has grown and done much more. However, the way in which funding is distributed has led to precarity in organisational revenue for CRIs, despite the overall funding increases, and we continue to observe elements of unproductive competition across all organisations in the research system. Overall, we see a system where demand for its support far outstrips the supply of resources. This makes our goal of raising national research and development expenditure to 2 per cent of gross domestic product a bare minimum”*. (p 2)

Nevertheless, government funding that supports health research activities does not appear to have increased by anything like 75% since 2010. Dedicated health research investment (eg through the Health Research Council and the health related National Science Challenges) has increased by 52% since 2010, and NZHR is not aware of any evidence to suggest that there has been sufficient investment increases from other non-dedicated contestable sources (eg MBIE Endeavour and Marsden funds and/or the Tertiary Education Commission (TEC)) to have a significant impact on this figure.

On the face of things it appears that health and medical research has not been receiving an appropriate or fair share of the total pool of government research investment funds.

One way to address this would be to dispense with current requirements for different research disciplines to compete with each other for scarce generic resources (eg health and medical research vs climate change research vs plant and food research etc) in favour of larger allocations to research disciplines, with the actual amount

⁴ MBIE. November 2019. <https://www.mbie.govt.nz/document-library/search?keywords=draftresearchscienceinnovationstrategy&df=&dt=&start=0>

determined by the sector’s share of GDP, and potential for economic and social benefit.

For the health research sector - and noting that TEC investment is out of the FPGP’s scope - this could involve pooling current HRC, Endeavour, Marsden and similar health research funding allocations into a single investment resource, with an appropriate growth trajectory, comprising two contestable investment streams - one for mission led health research where there are identifiable pathways to impact and one for investigator led research where such pathways are more difficult to identify.

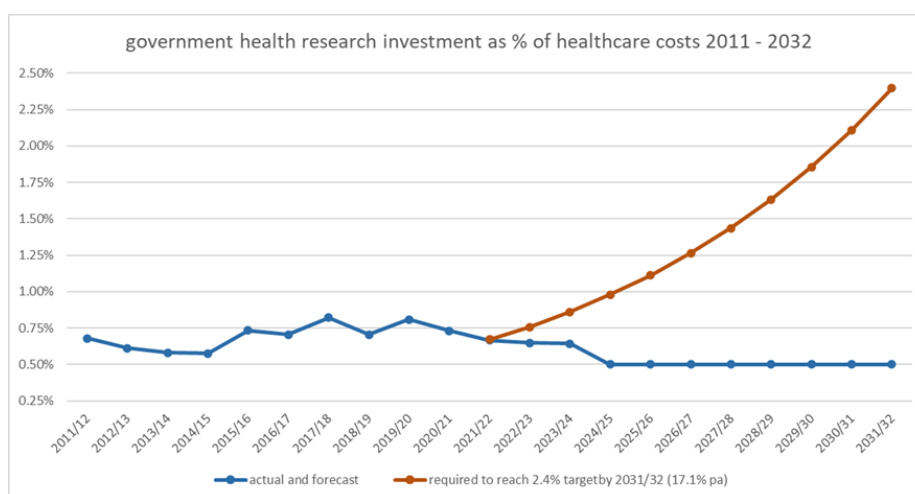
The FPGP (p27) notes that “Priorities will be an expression of the most important matters for New Zealand that can be enabled through the research system. They will not describe all research activity that will happen. They will describe a sub-set of research with a particular focus of activity and resources. There will remain funding and support for investigator-led research that takes place outside of these priorities”.

The FPGP then raises the key question of what principles could be used to determine the scope and focus of research priorities. NZHR suggests that enabling New Zealanders to live well for as long as possible should be one key overarching principle (which could transcend health research per se), especially given this country’s concerning rates and trends in respect of amenable and non-amenable premature mortality as outlined in the section below on pathways to health outcomes impact.

Government and other health research investment levels, trends and trajectories

Direct government investment in health research as a percentage of government health care costs has been falling over the last five years from 0.82% in 2017/18 to 0.67% in the current year 2021/22, and continuing to leave this issue unaddressed is projected to result in investment of 0.5% of health care costs by 2024/25, as illustrated in the chart below.

In response NZHR has argued that direct government investment in health research should be increased to 2.4% of direct government health care costs over the course of the next decade, requiring an investment growth trajectory of 17.1% per annum⁵.



⁵ NZHR. January 2022. NZHR 2022 Budget Policy Statement submission. <https://nz4healthresearch.org.nz/wp-content/uploads/2022/01/NZHR-Budget-Policy-Statement-submission-280122.pdf>

In the context of the government’s overall aspirational R&D target of 2.0% of GDP by 2027, we note that NZHR’s proposed ten year 17.1% p.a. trajectory would result in direct government investment in health R&D being a comparatively modest 1.4% of government health care costs by 2027.

Whether or not NZHR has selected an appropriate aspirational target, or appropriate numerators and denominators are moot points, and other options (based on NZHR’s analysis of 2018 figures) are presented in the table below⁶.

	Descriptor	Investment ratio
1.	Direct govt health research investment vs direct govt health care costs	0.72%
2.	Direct govt health research investment vs total govt costs of addressing ill health	0.59%
3.	Direct govt health research investment vs total govt and society costs of addressing ill health	0.31%
4.	Total govt health research investment vs total govt costs of addressing ill health	1.2%
5.	Total govt health research investment vs total govt and society costs of addressing ill health	0.65%
6.	Total health research investment (govt+industry+philanthropy) vs total govt and society costs of addressing ill health	1.2%

It will be noted that all of the investment ratios presented above fall well short of the goal of raising national research and development expenditure to 2 per cent of gross domestic product, which the FPGP describes as a “bare minimum”. Indeed, the Productivity Commission’s “Frontier Firms” report⁷ unfavourably compared New Zealand’s then current R&D investment rate of 1.3% of GDP with other small advanced economies which were typically recording rates nearer to 3%.

We also note that MBIE, the Ministry of Health and the Health Research Council have collectively acknowledged that New Zealand underinvests in health research⁸.

In the current environment where government health research investment is significantly constrained it possibly makes sense for funding applications to be required to demonstrate how the proposed research is expected or surmised to lead to positive impacts on health outcomes, for New Zealanders in particular.

However it should also be acknowledged that not all health and medical research will necessarily be able to meet these criteria. For example, it is unlikely that any of the scientists in the 1960s who discovered mRNA, produced the first liposomes and produced the first proteins from isolated mRNA in the laboratory⁹, would have been able to even conjecture the possibility of their discoveries being the foundations of today’s mRNA based vaccines.

⁶ NZHR. November 2020. Briefing Paper for the incoming Ministers of Health and Science, Research and Innovation. <https://nz4healthresearch.org.nz/wp-content/uploads/2020/11/NZHR-briefing-paper-for-incoming-Ministers-241120.pdf>

⁷ New Zealand Productivity Commission (2021). New Zealand firms: Reaching for the Frontier. <https://www.productivity.govt.nz/assets/Documents/Final-report-Frontier-firms.pdf>

⁸ The New Zealand Health Research Prioritisation Framework. Dec 2019. p 19. https://www.hrc.govt.nz/sites/default/files/2020-01/NZ%20Prioritisation-Framework-FA-web_0.pdf

⁹ Dolgin, E. The tangled history of mRNA vaccines. *Nature* 597, 318-324 (2021). <https://www.nature.com/articles/d41586-021-02483-w>

It should also be recognised that health and medical research in New Zealand operates in an international context and that our health and health research systems - and the New Zealanders which they serve - should be expected to both benefit from and contribute to the wider global effort. The extent to which New Zealand is, should be, and is seen to be, pulling its weight internationally, generally and for health research in particular, is an issue which should be addressed in the FPGP.

Design and structure of funding system and research institutions

NZHR notes the FPGP's section 4 discussion on the shape of research institutions, and the suggestion that they be enabled to give effect to whole of system priorities, and be adaptable in a fast changing world. We also note that there has never been a Crown Research Institute for health, and that the social research CRI has long since been disestablished.

Instead, the health research sector currently comprises a collection of university based Centres of Research Excellence (CoREs) (all of which experience potential precarity of funding, as illustrated by the recent discontinuation of the Centre for Brain Research and MedTech CoREs), independent medical research institutes, university based medical research institutes and other entities, health related National Science Challenges, and a number of clinical research organisations which primarily focus on undertaking clinical trials in response to both local and international demand. These entities are funded from various government (and other) sources, including Health Research Council funding which comprises about half of the government's total investment in health research, excluding R&D incentives.

NZHR's preliminary view is that the health research sector, and indeed the wider RSI system, could benefit from a "public benefit" health (or health and social science) CRI, or similar, which would undertake and fund health and medical research, and facilitate processes for translating research results into policy and practice.

Pathways to health outcomes impact

Health research and innovation is the single most important way in which we improve our health and healthcare - by identifying and implementing the best means to prevent, diagnose and treat conditions. Like the FPGP we want the health research system to achieve greater impact (p 60). By impact, we particularly mean a change to society (ie better health outcomes) beyond a contribution to knowledge and skills in research organisations.

Yet we have fallen short for Māori and non-Māori alike when it comes to realisation of that most fundamental of wellbeing outcomes - the right of all New Zealanders to live well to a "ripe old age". This "falling short" is illustrated in the non-amenable and amenable¹⁰ premature mortality charts^{11 12} presented on the following page

¹⁰ Amenable mortality is defined as premature deaths (deaths under age 75) that could potentially be avoided, given effective and timely health care. That is, early deaths from causes (diseases or injuries) for which effective health care interventions exist and are accessible to New Zealanders in need. Non-amenable premature mortality is total deaths under age 75 minus amenable premature deaths.

¹¹ [amenablemortality_2016_dhb_ethnicity_years_rates_summary_202106.xlsx \(live.com\)](#)

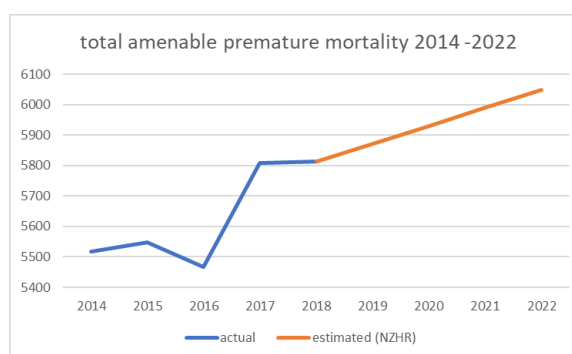
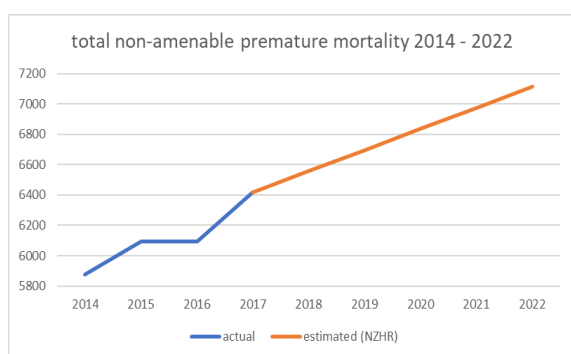
¹² <https://www.health.govt.nz/publication/mortality-2017-data-tables> and earlier tables

which indicate that approximately 13,000+ New Zealanders are dying prematurely. Of these 6000+ are dying early and unnecessarily from preventable causes (where the research has been done but not yet adequately translated into practice) and 7000+ are dying early because we haven't yet done or completed the research to know how to effectively treat them.

NZHR acknowledges that our figures represent the tail end of what up until 2016 had been a notable 26 year downward trend in age-standardised rate of years of life lost per 100,000 population¹³, and that our estimated up-ticking trend line post-2017 is based on only a few years' data. Nevertheless, there should be no complacency as the figures presented are still high in absolute terms, and New Zealand's rate of years lost is higher than nine out of thirteen selected socio-demographically comparable countries cited in the MoH (2020) "Longer, Healthier Lives" report.

Furthermore, NZHR's premature mortality figures represent the tip of a much bigger iceberg of morbidity. It is difficult to quantify the extent of this from the MoH (2020) report for the under 75-year-olds specifically, but for all ages the report notes that the number of years people are living with poor health has shown little change since 1990.

These health outcomes indicate that New Zealand's health research system is not impacting as positively as it should be, and NZHR hopes that the FGP will be one of the catalysts for improvement.



We note the Health Research Council's comment that "New Zealand is the only country that can configure effective evidence-based prevention and intervention strategies for our diverse population. Given that over 1/3 of health loss is preventable, this is an essential area of research that needs to be undertaken in our context." ¹⁴

We believe that the current pathways for translating health research findings into better health outcomes are loose, ad hoc and dependent on local health service delivery leadership. We have supported the HRC's introduction of 2-year and 5-year post-contract surveys to help capture research impacts, we have supported the application of MBIE's generic position paper on the impact of research¹⁵, including the importance of a line of sight to impact. Furthermore we share the concerns

¹³ Ministry of Health. 2020. Longer, Healthier Lives: New Zealand's Health 1990-2017. A report on the health loss estimates of the 2017 Global Burden of Disease Study <https://www.health.govt.nz/system/files/documents/publications/longer-healthier-lives-new-zealands-health-1990-2017.pdf>

¹⁴ November 2019. <https://www.mbie.govt.nz/dmsdocument/10480-health-research-council-of-new-zealand-draft-research-science-and-innovation-strategy-submission-pdf>

¹⁵ MBIE. October 2019. The Impact of Research. <https://www.mbie.govt.nz/dmsdocument/6983-the-impact-of-research-position-paper-october-2019-pdf>

expressed in the FGP “about a knowledge gap that exists between the new and good ideas generated within the [health] research sectors and the rate these ideas are used or implemented - either turned into new products, services or even business models, used to inform public sector approaches or services, or otherwise translated into impacts by their use.

However, despite best intentions health researchers themselves sometimes appear to struggle to articulate how the results of their research save and improve lives. For example of the eight excellent case studies presented in a University of Otago “Impacts of Research” publication¹⁶ only one¹⁷ was able to articulate impact in terms of improvements in health outcomes.

Another illustrative example is provided by the University of Otago led development of new testing criteria for stomach cancer, which has considerable life saving potential, particularly for Māori.¹⁸ In a personal communication¹⁹ to NZHR, principal investigator Professor Parry Guildford said:

“the guidelines were produced on behalf of the International Gastric Cancer Linkage Consortium (IGCLC) [with] our....version [being] the latest in this sequence. These guidelines are considered the official word in the management of this form of cancer internationally - although we are really just a self-appointed expert group. As far as I know, hospitals are not required to follow these guidelines, but given their utility and highly reputable etiology, our recommendations do make it into clinical practice as the gold standard worldwide. This time, we have had input from several senior NZ genetic counsellors and clinicians, hence our ability to include a genetic testing recommendation for Maori. So, I guess the DHBs here would consider these guidelines to be ‘informal’, but they fill a need and will be largely adopted”.

NZHR believes that current arrangements for translating health research into practice need to be tightened so that there is an obligation on health service providers to implement evidence based best practice and to quantify the subsequent impact on health outcomes.

Moreover reliance on having the results of research published as one of the steps for translating research into policy and practice can be problematic, as pointed out by the Healthier Lives National Science Challenge: “a measure such as the number of citations in the top 1% worldwide is not a predictor of excellence for Māori and Pacific research because the rest of the world does not have the same level of interest in it as New Zealand does.”²⁰ The Whakauae Research for Māori Health and Development submission on MBIE’s draft RSI strategy also notes that “translation and uptake of research in Māori settings tends to occur in spite of academic publications, not as a consequence of them”.²¹

NZHR has previously recommended that:

¹⁶ University of Otago Division of Health Sciences. Undated but understood to be mid-2020. Impacts of Research

¹⁷ Case study 6. Cardiac Biomarkers used in Heart Failure Diagnosis, Prognosis and Treatment. University of Otago Division of Health Sciences. Impacts of Research

¹⁸ University of Otago. August 2020. Research team hopes Māori lives will be saved with new testing criteria for stomach cancer. <https://www.otago.ac.nz/news/news/otago741855.html>

¹⁹ Prof. Parry Guildford PhD FRSNZ. Director, Centre for Translational Cancer Research. Cancer Genetics Laboratory Department of Biochemistry. University of Otago. 24th August 2020. Personal email.

²⁰ November 2019. <https://www.mbie.govt.nz/dmsdocument/10481-healthier-lives-national-science-challenge-draft-research-science-and-innovation-strategy-submission-pdf>

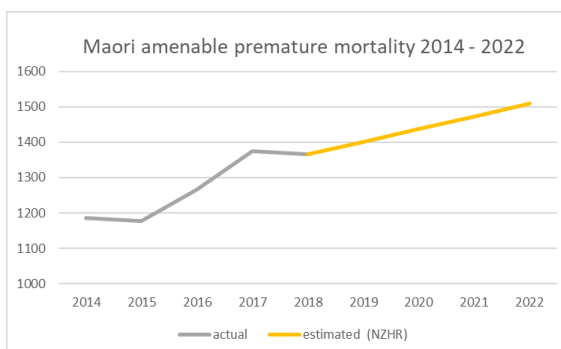
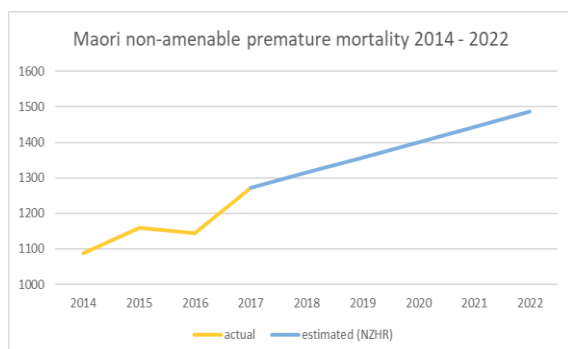
²¹ November 2019. <https://www.mbie.govt.nz/dmsdocument/10556-whakauae-research-for-maori-health-and-development-draft-research-science-and-innovation-strategy-submission-pdf>

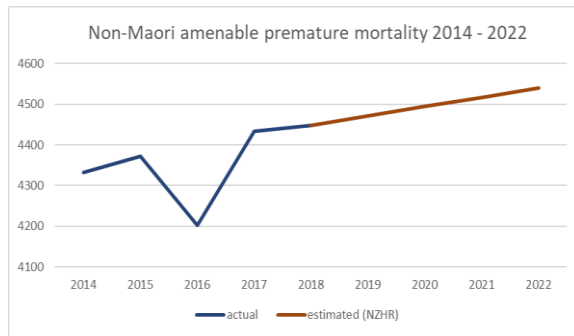
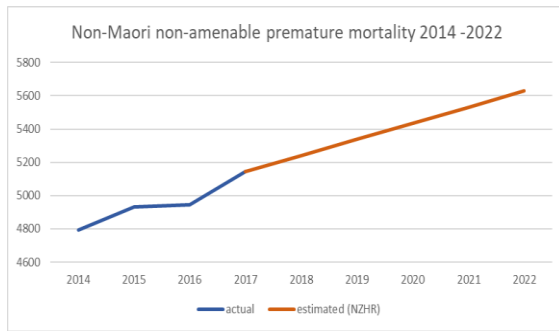
- An agency be created to identify and promulgate up to date evidence based best practice standards and guidelines for clinical care and service delivery (similar in concept to the now disestablished Clinical Guidelines Group). In the light of the FPGP this could possible become one of the functions of a new health CRI.
- Publicly funded health service providers be contractually required through health commissioning arrangements to deliver services in accordance with best practice standards and guidelines, to be involved in undertaking health research, and to have demonstrable processes for translating the results of health research into policy and practice
- Workforce development strategies be implemented which would see research fellows, clinical research specialists etc being routinely deployed as key members of clinical and health care teams, responsible for ensuring that clinical decisions are supported by the best evidence
- Clinical training and continuing clinical education and registration agencies be reviewed to ensure that their processes ensure that emerging and current clinicians are required to practice according to best evidence based standards of care
- Health commissioning agencies be required to meet premature amenable mortality targets and be given the ability to purchase evidence based best practice services from whoever is best placed to help meet those targets, including individuals and whanau/family.

Mātauranga Māori and embedding Te Tiriti in the research system

A breakdown of the total premature amenable and non-amendable mortality figures (as presented earlier) for Māori and non-Māori is presented below. Despite the apparent similarity of the Māori and non-Māori trend lines, the source documents cited previously indicate that age standardised Māori premature mortality rates per 100,000 population are running at about twice the rate for non-Māori for both non-amenable and amenable mortality.

It can be inferred from these figures that current and past approaches to undertaking and translating the results of health research have not served Māori well in terms of life outcomes.





Adopting the language of the FPGP, this paper is therefore inclined to agree that “more work needs to be done to explore how the health research system can best uphold Te Tiriti obligations and opportunities. We must consider how to embed Te Tiriti within the fabric of the health research system, in decision making, in our processes, in collecting advice and information, in our workforce, and in health research outcomes...we need to reimagine how to give life to Māori health research aspirations, the right ways to enable mātauranga Māori - Māori knowledge - in our health research system and the interface between mātauranga Māori and other activities in the system” (FPGP p.38)

Workforce development

NZHR agrees that there needs to be a serious approach to talent development (FPGP p21) - and retention.

Reid et al (2014)²² “look back on a decade of diminishing investment in health research in New Zealand. During this time, investment in our hospitals has substantially increased, as have the number of academic staff working in medicine and public health. As a result, an increasing number of would-be researchers have been pursuing a progressively diminishing pool of resource to support research, resulting in funding rates in HRC grant rounds which are among the lowest in the world, and one-third of those in Australia.”

“Such low rates of grant success discourage individuals from submitting grants, but also discourage academics from working in New Zealand. The medical faculties in both Otago and Auckland suffer a steady loss of academics disgruntled by the research funding environment, who move overseas, most commonly to Australia”.

“We also face a continual battle to recruit academics, including expatriate New Zealanders, because there is the perception that moving to New Zealand necessitates abandonment of serious medical research activity”.

“The current crisis has arisen because there has been no indexing of research funding to the cost of research, nor to the size of the workforce that should be research-active. Structural changes need to be put in place to ensure that these parameters guide future levels of funding”.

In 2014 investment in health research was at a particularly low level, and although there have been some gains since then NZHR maintains that the issues identified by Reid et al continue to be pertinent in 2020, and we continue to hear anecdotally

²² Reid I et al. Government funding of health research in New Zealand. NZMJ. Vol 127 No 1389: 14 Feb 2014. <https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2014/vol-127-no.-1389/5992>

from clinicians about their surprise and dismay about how clinical practice in New Zealand is disconnected from and unsupported by health research. Otago University's Division of Health Sciences has noted that "we have great difficulty getting clinicians in some of the DHBs we work with to engage at all as they are 100% focussed on meeting the KPIs of the DHB in terms of patients seen, etc. Research has very low status in these DHBS".²³

We also refer to the University of Auckland Faculty of Medical and Health Sciences Postdoctoral Society submission²⁴ on MBIE's earlier draft RSI Strategy which highlights the many barriers to recruiting and retaining early stage health and medical researchers, and agree that there would be much benefit in career pathways which are unshackled from short term contracts based on short term research project funding. Moreover, health research workforce development should include commitments to both diversity and adequate remuneration as mentioned in the Maurice Wilkins Centre submission on MBIE's draft RSI strategy²⁵. The Healthier Lives National Science Challenge adds that there appears to be a steady drain of Māori PhDs from the science system, especially in the field of health, and as a result there is considerable strain placed on Māori researchers who remain in the system from the many demands on them²⁶.

If New Zealand is to sustain a world class health research workforce the government's health research investment has to be both significantly lifted and allocated so that health research becomes embedded as an essential component of the health system itself.

The place of existing frameworks and strategies

New Zealand has a pre-existing Health Research Strategy²⁷, the parties to which are MBIE, the HRC and the Ministry of Health. Although implementation appears to be ad hoc and slow, with no clear overall leadership, it is important that momentum is both maintained and lifted, and that this strategy is not left to drift into obscurity as a result of focuses shifting to the FPGP and its outcomes.

Other

There will be an opportunity for other important issues not identified in this paper to be discussed at the February 22nd workshop.

Chris Higgins

Chief Executive | New Zealanders for Health Research

Research Associate | AUT Faculty of Health and Environmental Sciences

+64 27 292 8433 | ceo@nz4healthresearch.org.nz

21st February 2022

²³ November 2019. <https://www.mbie.govt.nz/dmsdocument/10548-university-of-otago-division-of-health-sciences-draft-research-science-and-innovation-strategy-submission-pdf>

²⁴ November 2019. <https://www.mbie.govt.nz/dmsdocument/10544-university-of-auckland-faculty-of-medical-and-health-sciences-postdoctoral-society-draft-research-science-and-innovation-strategy-submission-pdf>

²⁵ November 2019. <https://www.mbie.govt.nz/dmsdocument/10496-maurice-wilkins-centre-draft-research-science-and-innovation-strategy-submission-pdf>

²⁶ November 2019. <https://www.mbie.govt.nz/dmsdocument/10481-healthier-lives-national-science-challenge-draft-research-science-and-innovation-strategy-submission-pdf>

²⁷ New Zealand Health Research Strategy 2017 - 2027. Ministry of Health and Ministry of Business Innovation and Employment. 2017 <https://www.health.govt.nz/system/files/documents/publications/nz-health-research-strategy-jun17.pdf>