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To:	Research, Science and Innovation Strategy Secretariat
Subject:	Draft Research, Science and Innovation Strategy submission
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Submission on Draft Research, Science and Innovation Strategy recevied:

Are you making your submission as an individual, or on behalf of an organisation?
Organisation

Name
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Which of the below areas do you feel represents your perspective as a submitter? (Please select all that apply)

If you selected other, please specify here:

Gender

Ethnicity

Name of organisation on whose behalf you are submitting, if different to the organisation named above

In which sector does your organisation operate: (Please select all that apply)
Research , Other

If you selected other, please specify here:
Tertiary Educational Institutions

How large is your organisation (in number of full-time-equivalent employees)?
4,080

Please indicate if you would like some or all of the information you provide in your submission kept in confidence, and if so which information.
Not necessary.

Please upload your submission document here
Otago-DHS-response-to-draft-RSI-strategy.pdf - Download File

Feedback on the New Zealand Draft RS&I Strategy document
From the Division of Health Sciences, University of Otago

Thank you for this opportunity to comment on this document. It was provided at a very busy time of year for Universities and with a short turn-around time so this feedback has only been solicited from Associate Deans Research in the Division of Health Sciences (Biomedical Sciences, Medicine, Dentistry, Pharmacy, Physiotherapy) and not all staff, and is of a limited nature due to time constraints.

We would like to commend MBIE for identifying a number of key constraints on research science and innovation in New Zealand, such as lack of funding, lack of career paths for research scientists, outdated legislation, and difficulties in providing necessary infrastructure, and proposing some mechanisms to reduce these constraints.

Magnet for talent
1. We think the Phrase "making New Zealand a magnet for talent" sends the wrong message- what we need to do is "make New Zealand a nurturing environment for talent". We lose a lot of talent overseas - keeping some of that here and providing a career pathway to allow talent to develop at home would reduce reliance on having to attract talented people from overseas.

Unique to New Zealand
2. We think that the focus on research that is unique to, or can only be done in, New Zealand is wrong and will stifle innovation. This directly opposes the notion of making New Zealand a nurturing environment for talent. Talent and entrepreneurship come in all shapes and sizes and the best outcomes are obtained by first nurturing, and then enabling, excellent research and researchers. Researchers are clever and will respond well to signals if given the opportunities and incentives to learn how to respond. They are also very mobile and the world is open to taking our best researchers, who will go elsewhere if the home environment is not supportive of research.

While New Zealand may appear to have a flow of incoming researchers, note needs to be taken of the quantity and quality of outgoing researchers, especially the lost potential of early career researchers.

New businesses and sectors will be built around kernels of excellence, whether the research could be done overseas or not. The unique advantage to New Zealand is the talent not the topic. It is counter-productive being isolationist- we need to be the best we can be in the world, not just New Zealand.

We also need to support research in a range of disciplines if we are to continue to have research-led teaching in our universities. In health this is really important as we need the health practitioners who we are training to have comprehensive research-informed knowledge and be able to interpret, adopt. and apply the findings of future research to benefit the New Zealand population. We need to keep

supporting excellence in research across all disciplines to be able to respond to new challenges that arise, e.g. climate change, bird flu, PSA.

Within health research, New Zealand must play its part as a global citizen and has a duty of care to its neighbours in the Pacific. It is important for us to contribute research towards alleviating the global burden of ill-health and to maintain our international profile as an excellent place to conduct health research and innovate.

3. We note from Figure 1, page 16, a projected significant increase in total R&D expenditure over the period 2020 – 2028 which is encouraging. We also note an increasing additional spend by government which is also encouraging. We hope that some of this expenditure can increase the total amount of research undertaken as well as index-linking grant caps and also fund infrastructure, fellowships and research dissemination. It would be good if the document can state clearly what the extra funding will support.

Extending Vision Mātauranga

4. We totally agree that building closer ties to Māori is crucial for the sector. At Otago we have achieved equity in the numbers of Māori students in our Medical programme and are well on track to achieve equity in most of our other health professional programmes. Attracting these students into research careers, however, is difficult as they can find better paying work as health professionals or working for government agencies. We work hard to support our Māori BSc students and attract them into research- but many prefer to go into medicine after their BSc. More fellowships and a career pathway for research-only staff would definitely help.

We agree that we need to have more Māori working in the RS&I sector.

The HRC is already embarking on a programme of requiring research groups to show how they are contributing to Māori advancement. This approach is likely to result in very positive engagement by researchers and universities.

Research at the Frontier

5. The most likely research to lead to transformational changes and new industries is research that takes risks. For instance, drug development is a very risky business but it has massive benefits if it is successful. John Kernohan did an excellent review of the Marsden Fund in the early 2000s. At that time the Marsden Fund was generating more commercialisable ideas than FRST funded projects.

6. Most existing New Zealand businesses are currently quite risk-averse and more interested in research behind the frontier.

New Zealand advantages

7. New Zealand has the Virtual Health Information Network which allows researchers to access and use health and social data and generate insights to improve the health and wellbeing of all New Zealanders. New Zealand health data is of a higher quality and better integrated than others internationally and the existing connectivity of our

small community of researchers puts us in a good position to undertake Big Data research in this sector.

8. New Zealand has the advantage of having Māori and Pacifica peoples with differing world views and approaches to problems. Adopting some of their approaches to problems, for instance care of the elderly, is likely to provide us with advantages.

New Zealand challenges

9. The risk appetite of the current funding agencies is extremely low. Even the MBIE Endeavour Fund, which claims to want transformational ideas, then requires extraordinary risk-mitigation clauses for the projects. All funders are very conservative.

10. Geographical isolation and the costs of travel within New Zealand. Connectivity costs a lot of money. The HRC say that you can put dissemination and "next step" items into your budget but only within the existing funding cap, which has not kept pace with inflation and they agree is already insufficient. There is only so much that can be done by videoconference. Many funders require connectivity but are not willing, or able, to pay for it. A separate fund for connectivity or a top-up for every funded grant would be a help.

11. Lack of appetite of academic staff for additional unrewarded work. Staff are pulled in multiple directions. They are expected to be excellent teachers, internationally excellent researchers (which involves travel overseas), to spend time building relationships with Māori and Pacific communities - which requires a big time commitment, to define the impact of their research and spend time building the pathways to it by engaging with commercialisation/clinicians/patient groups, etc., to increasingly engage with and attract international students, travel to potential source countries and provide the additional pastoral care international students require, to deal with an increasingly anxious cohort of undergraduate students and undertake a lot of administration work previously performed by professional staff. Academics are exhausted and most work 70-80 hour weeks.

12. The commercial imperatives on the CRIs makes it extremely difficult to collaborate with them due to their need to own all the IP.

13. The PBRF fund is always being described by MBIE as "being available to support research". In fact ~75% of the money allocated to that fund was originally taken from funding previously used to support postgraduate students. Since the Universities first contributed this money to the PBRF pot and competed for it, no other source of support for postgraduate students has been provided, so most Universities, by necessity, use PBRF returns to support postgraduate students and it is not available for any other form of research and it would be helpful if MBIE would stop saying that it is.

14. The strategy needs to acknowledge that 97% of all business in New Zealand are small (1-19 employees) and on an annual basis roughly only 6% of these engage in R&D activities[1]. Therefore, the government is asking for a very large step up from the remaining businesses of sufficient scale to bridge the gap in R&D investment to bring the New Zealand R&D investment closer to the OECD average. The number of New Zealand researchers and subject areas with which these remaining companies want to engage is going to be very small.

15. For some subject areas like health, natural commercial partners are going to be big international companies and not New Zealand ones. This can be an advantage as it can bring international funding for research and start-ups into the country. We believe that the Catalyst funding that has been available for building international linkages has been very helpful and should be continued and expanded.

16. Regulatory barriers like the ban on the release of GM organisms has stifled the development of biotech businesses in New Zealand and means many of our good ideas have to be developed off-shore. An examination of the regulatory framework is imperative. There is also a need for funding to investigate social licence for new technologies.

Effectiveness of the public service

17. Interacting with policy makers is difficult for researchers for a number of reasons.

- Not least is the problem that policy makers seldom remain in their jobs for longer than two years.
- The policy-making timeframe is much shorter than that in which research can effectively provide answers.
- Frequent travel to Wellington to maintain relationships at their own cost is not an option for many researchers.

Two things could be done:
1) Each ministry could set up a "clearing house" unit whose job it is to build relationships with researchers in their sector, monitor the evidence coming from research and provide this to policy makers in an appropriate format.
2) Initiate a public service fellowship much as the recently announced SFI pilot: https://www.sfi.ie/funding/funding-calls/public-service-fellowship/index.xml

The initiative to have science advisors in ministries is very positive and they could potentially run these other initiatives.

Connectivity

18. We agree that there is a major barrier to the uptake and impact of research beyond the researchers.

[1] Report of the Small Business Development Group 2016, MBIE website

19. DHBs need to be enabled to both engage in research and more quickly/easily adopt new evidence. This is an expected outcome of the New Zealand Health Research Strategy but there has been no visible action from the MoH as of yet. 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.

20. Professional knowledge brokers would be really helpful, as mentioned earlier; it is unrealistic to expect all researchers to be able to undertake this work.

21. The commercial imperatives on the CRIs make them extremely difficult to collaborate with due to their need to own all the IP.

22. Some research organisations are aggressively self-interested and researchers will walk away from even considerable amounts of funding for collaboration in the face of such behaviour. It is hard to see how MBIE could mitigate this entrenched behaviour.

23. The KiwiNet and Auckland Uniservices Return on Science commercialisation networks are effective but have limited resources. Researchers don't always understand the value of their research. The recent practice of the HRC to identify potential commercial opportunities in their funded Explorer grants and to direct these to KiwiNet and RoS is a good move. Providing some additional expertise like this between the research and the 'next step' is needed as University R&E Offices have insufficient capacity.

24. Stop adding more and more responsibilities onto research staff, which makes them stressed and resentful, and start providing them with help to engage.

25. The strategy should put more value on social enterprise- currently it is largely focussed on commercial activity.

MBIE could:

- Provide a travel fund that could be used for engagement activities in New Zealand
- Pay for case studies of successful impact stories to be compiled and disseminated as examples of good pathways
- Provide additional financial support to funded projects for pathway definition, dissemination, connection and implementation
- Fund some knowledge translation positions
- Fund some health economist positions
- Fund data clearing agencies attached to ministries
- Fund internships for researchers into public service.

Diversity and Career structure

25.

- Science and research are becoming much less attractive as career options. Only a small proportion of scientists will be able to obtain permanent academic positions and other research jobs are precarious.
- Because New Zealand industry does not invest much in R&D there are few research jobs in the private sector.
- Younger people have greater expectations of work-life balance and working as hard as current Professors and senior researchers do is not attractive and many choose to leave the sector.
- New Zealand universities have poor statistics for the ratio of women in senior research positions, especially if age of attainment is taken into account.
- Increasing numbers of Māori and Pacific islanders are graduating with both undergraduate and postgraduate training.
- These well-trained Māori and Pacific islanders are choosing good jobs outside the research and science sector- many in government.
- Unconscious bias in appointment and promotion is real.
- LGBTQ awareness is at low levels in both research staff and leadership.
- Māori researchers are often really overburdened with additional responsibilities because of their position in their communities and this makes research less attractive to them.
- We are not able to retain many talented young people who come to New Zealand to do their PhDs. Many would stay if there was funding for which they were eligible (often positions have citizenship or residency restrictions).
- Diversity needs to include differently abled people.

How can we respond to these obstacles?

- Universities need to continue to aspire to population-level representation of Māori and Pacific Island students in their cohorts. This is a resource - intensive exercise as many of these students are starting from a lower entry point and the current block funding does not cover the additional pastoral care required to guide them to success. MoH have funded our (very successful) Māori support programme, but future funding is not guaranteed.
- Socio-economic equity is also needed - again this comes with costs that are not currently being met by TEC.
- Increased training around unconscious bias and understanding of LGBTQ and disability is definitely needed in the sector.
- Better career structures for research staff at every stage - not just the early career stage - are needed. The Australian Fellowship schemes seem to nurture a significant number of researchers through different career stages.
- Refrain from continually increasing compliance and additional work for researchers. Instead, provide them with agencies or professionals to help, and training to improve their own abilities to respond. Otherwise the career path is not attractive to a diverse range of people, only those with support/privileged backgrounds can manage.
- Provide funding for additional staff to develop cultural competence, support professional development for all researchers and enable greater engagement with Māori without increasing the burden on the few existing Māori staff.

- Ensuring adequate levels of contestable funding are available for researchers is a prerequisite for making New Zealand an attractive destination for overseas experts. Increases in public-sector funding in the past 10 years need to be built on and not allowed to stagnate or be eroded.
- The strategy should not aim to homogenise but rather build on the strengths of our diverse people.

Question 15: How can we improve the way we measure the impact of research?

It is agreed that measurement of impact is a positive step in articulating the return on investment of research funding. From a practical point of view, it is difficult to answer the question of how we can improve the way we measure the impact of research, as the resourcing requirements and reporting requirements of measuring research impact are not addressed in this paper.

We agree with the statement in *The Impact of Research* paper produced by MBIE in October 2019 that it is important for research organisations to have a line of sight to impact. In addition to the existing acknowledgement that impacts are unpredictable, it is important to recognise that not all research does achieve impact beyond academia. This is not necessarily a failure of the research, particularly as the ultimate impact of research is out of the researcher's direct control, and dependent on a wider system. David Sweeny the Executive Chair of Research England who initiated the UK impact assessment, has stated that he only expects that 10% of funded research will result in impact (1, 2, 7).

MBIE's definition of research impact: *A change to the economy, society or environment, beyond contribution to knowledge and skills in research organisations* is consistent with some international definitions highlighting that the definition of impact is impact achieved beyond academia (2, 3). It is important to acknowledge that should academic 'impact' remain an *outcome* in MBIE's model (as opposed to an *impact*) that it is still has great value and this value should be recognised. Researchers themselves identify academic impact as important to them. For example, in Australia, health care researchers were asked what impact they expected to achieve with their research, and answers included impacts in the areas of presenting work, publishing, training staff and creating further research opportunities (4). Additionally, the foremost research impact model from Buxton & Haney (1996) (5) includes the category of 'knowledge' as a *payback* (impact), as does a recent systematic review of methodological frameworks by Cruz Rivera et. al (6) which includes *primary research-related impact* as a category of impact. From our experience, the ability to describe academic-related impact appears particularly relevant to researchers in basic science areas, where collaboration and dissemination are key to leading to new scientific methods and discoveries.

As with academic impacts: policy impact and informing programmes are defined as *outcomes* in MBIE's current model, whereas in the previously mentioned

frameworks (5, 6) these are defined as *impacts*. Cruz Rivera et. al (6) also define commericalisation/R&D investment as an *impact*, whereas for MBIE this is an *outcome*.

Practically speaking, the definition of impact is crucially important for measurement. If the impact definition is to remain the same, measurement of what can be measured, which may be outputs and outcomes, may be more practical, with impacts themselves only able to be articulated by select projects, particularly given the time it takes to translate research into practice. This was highlighted in an analysis of 162 research impact case studies in community-based health sciences from the UK's 2014 Research Excellence Framework (REF) - the majority of impacts articulated were short-term and one-step removed from patient outcomes (2). The authors concluded that further thought needs to be given on how long-term and indirect impacts can be captured (2) - the same impacts that MBIE appears to wish to measure.

We support further investigation into the practicalities of research impact measurement, as well as the meaning of impact for different groups of researchers (for example, biomedical scientists, applied researchers, Māori and Pasifika researchers), as a 'one-size fits all' approach to impact would seem unlikely to work across a diversity of research types in health sciences.

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3. Ravenscroft J, Liakata M, Clare A, Duma D. Measuring scientific impact beyond academia: An assessment of existing impact metrics and proposed improvements. PLOS ONE. 2017;12(3):e0173152.
4. Reed RL, Kaulcy EC, Jackson-Bowers E, McIntyre E. What research impacts do Australian primary health care researchers expect and achieve? Health Research Policy and Systems. 2011;9(40).
5. Buxton M, Hanney S. How can payback from health services research be assessed? J Health Serv Res Policy. 1996;1(1):35-43.
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7 Seweeny , D. Humane -EMFD Winter School presentation March 2017

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