



Strategic Refresh of the Health Research Council

Report to the Minister of Health and the Minister of Science
and Innovation

Jointly prepared by officials from
the Ministry of Health and
the Ministry of Business, Innovation and Employment

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Foreword

Health research has underpinned advances in human longevity, led to the near or complete eradication of previously crippling diseases such as smallpox or polio, and generated whole new ways of treating illnesses and conditions – vaccines, transplants, cancer diagnostics, chemotherapy and laser treatment. International evidence suggests that health research is accountable for around a third to a half of the improvements in health outcomes experienced over the 20th century. These improvements have also contributed to raising labour productivity and living standards.

Health research includes biomedical, public health, clinical and health services research. Each of these areas has made valuable contributions, increasingly at the intersections of different disciplines. Biomedical research has been central to advances in understanding of the human body, diseases and illnesses, and to the generation of treatments and cures. Public health research has identified how factors such as housing, passive smoking, air quality and access to health services influence health and well-being and actions that can address these factors. Clinical research has developed new approaches to health care and improved the effectiveness of medications, devices, diagnostics and treatment regimes. Research on health services has helped improve the accessibility of health services and has identified ways in which healthcare providers can use the new knowledge generated from other areas of health research.

Health research is a global endeavour to which New Zealand health research has contributed and benefited from. Importantly, our health research has also generated impacts for New Zealand: proving the link between meningococcal disease and household crowding which has informed the *Healthy Housing Initiative*, saving children's lives by identifying the factors behind cot death and through the discovery of betamethasone to prevent lung disease in newborns, generating tools to capture patient data in our primary health organisations, and improving clinical practice and care protocols and the links between our environment and our health. Undertaking research here also improves our ability to make effective use of health research findings generated offshore.

The growing health sector, both in New Zealand and internationally, presents significant opportunities for health research and our innovative medical technology firms. New Zealand's sustained investment in health research has already contributed to the growth of the diagnostics, medical devices and health IT sectors. In addition, as New Zealand is a biological economy with a large agricultural sector there are multiple benefits associated with investment in health research, particularly biomedical science.

The Health Research Council (HRC) has played a critical role in supporting health research in New Zealand. The strategic refresh of the HRC seeks to generate more impact from New Zealand's health research. It recommends an ongoing central role for the HRC in health research in New Zealand and signals health research as a priority for investment.

Executive Summary

This report of the strategic refresh of the HRC provides Ministers with advice on how to maximise the contribution of the HRC to the government's health and economic goals. The advice seeks to ensure health research plays a central role in both the health sector and the science and innovation system.

The strategic refresh recommends improving the strategic alignment of those who have a stake in health research and innovation in New Zealand. The primary vehicle proposed for achieving this is the development of a health research strategy, to be led by the Ministry of Health and the Ministry of Business, Innovation and Employment. The strategy would set priorities for health research, improve alignment between funding mechanisms, and enhance connections across the health research and innovation system. The HRC has a unique contribution to make in the strategy's development through its knowledge of health research and connections with the sector.

The report signals the benefits for New Zealand of HRC funding excellent research which has the potential to generate significant impacts for New Zealand. The HRC needs to strike and maintain a balance between research that contributes to the global endeavour placing New Zealand on the world stage, and research unique to our local context that will not be conducted elsewhere, such as on our health service delivery system. The HRC must also continue to support multi-disciplinary research which has the potential to generate major scientific breakthroughs and innovative solutions.

The HRC is generally respected for its robust science assessment processes, but it can make an even greater contribution by playing more of a leadership role in the sector. The HRC has a wealth of knowledge of the health research sector, and this can be put to better use, with the HRC acting as a repository of knowledge on health research and facilitating better connections between researchers and end users. In light of the enhanced role for the HRC, a commensurate increase to the HRC's operational funding is recommended.

The report recommends improvements to the governance of the HRC that would mark health research as important to both the health sector and the science and innovation system. The HRC has a dual governance arrangement with both the Minister of Health and the Minister of Science and Innovation. The refresh recommends enhancing this dual responsibility to ensure more effective strategic guidance for the HRC. No changes to the HRC's legislation are considered necessary.

Stakeholders have consistently identified the relatively low level of funding provided to health research in New Zealand. Demonstration of scientific excellence and impact needs to form the cornerstone of building a case for funding increases. A robust process for negotiating and setting the HRC's funding that involves both Ministers needs to be established. A more comprehensive investment impact report, produced by the HRC, will be critical in reviewing the HRC's funding level. Officials note that the level of HRC funding has remained relatively static in nominal terms since 2009/10. In recognition of the critical role health research plays in both the health sector and the science and innovation system, and in the context of the Government's commitment to raise science funding to 0.8% of GDP, health research should be a priority for funding increases.

Recommendations

Embedding health research into the health and innovation systems (Chapter 3)

Recommendation 1 **Agree** that the overall design of the HRC is appropriate, and that systemic improvements are needed to more effectively embed health research into the health sector and innovation system, and to achieve greater value and impact from the HRC's research investment.

Recommendation 2 **Direct** the Ministry of Health and MBIE, in close collaboration with the HRC, to establish a 10-year health research strategy which will recognise the centrality of health research to both the health sector and the science and innovation system.

Recommendation 3 **Agree** that the health research strategy will: (i) align with health and science systems strategies, in particular the New Zealand Health Strategy and the National Statement on Science Investment (NSSI); (ii) seek to better connect health researchers and end users; (iii) signal the importance of health research to health outcomes and service delivery; (iv) clarify the roles of the actors in health research and innovation; (v) signal medium- to long-term health research priorities; (vi) align health research funding mechanisms to maximise impact on health and economic outcomes.

Recommendation 4 **Agree** that, following the completion of the health research strategy, it is appropriate that the HRC develop three-yearly investment plans that articulate the HRC's investment priorities and portfolio approach, and that the investment plans be reflected in the HRC's Statements of Intent.

Recommendation 5 **Direct** the Ministry of Health and MBIE to monitor the implementation and progress of the health research strategy and three-yearly investment plans.

Role of the HRC (Chapter 4)

Recommendation 6 **Agree** that the key roles the HRC should focus on are: (i) providing strategic leadership in the health research sector; (ii) funding excellent research which has the potential to generate significant impacts for New Zealand; (iii) fostering a strong and diverse health research workforce in conjunction with universities, district health boards, independent research organisations and other statutory and non-government agencies, and increasing its support for Māori and Pacific researchers.

Recommendation 7 **Agree** that it would be appropriate for the HRC to lift its profile by developing a communications strategy to ensure: clear messages relating to the benefits to New Zealanders of health research as well as the impacts of HRC-funded research; the potential for user uptake in research is realised; and opportunities for valuable research are not lost.

Recommendation 8 **Agree** that, once the health research strategy has been developed, it would be appropriate (i) for the HRC to strengthen its assessment of impact by: requiring pathways to impact, increasing the weight of the impact criterion, shifting the impact criterion towards direct benefit to New Zealand, and considering assessing impact through a dedicated panel with a mix of scientists and end users; and (ii) that this change be signalled in its first three-year investment plan.

Governance of the HRC (Chapter 5)

Recommendation 9 **Note** that a change to the ethical framework or processes of the HRC may be desirable in future, pending the findings of the National Ethics Advisory Committee's review of cross-sectoral ethics arrangements and development of new ethical guidelines.

Recommendation 10 **Request** the HRC to prepare, every three years, a comprehensive investment impact report which shows how the work it funds has contributed to achieving health, social and economic outcomes for New Zealanders.

Recommendation 11 **Agree** that the MoU between Ministers be updated to: (i) reflect the importance of health research to both the health sector and the science and innovation system; (ii) specify a process for the Minister of Science and Innovation to be involved in giving strategic guidance to the HRC; (iii) reflect involvement of both Ministers in the process of setting the funding level of the HRC; and (iv) specify that the HRC will provide a comprehensive investment impact report every three years to report on impacts and inform future investment.

Recommendation 12 **Note** that the strategic refresh has led to increased communication about processes, practices and knowledge sharing between the Ministry of Health, MBIE and HRC at both operational and strategic levels.

Operations and processes of the HRC (Chapter 6)

Recommendation 13 **Agree** that it would be appropriate for the HRC to consider its operations and processes in light of the findings of the strategic refresh.

Recommendation 14 **Agree** that it would be appropriate for the HRC to further internationalise the membership of its science assessment panels beyond Australasia in order to minimise the risk of conflicts of interest arising.

Funding of the HRC (Chapter 7)

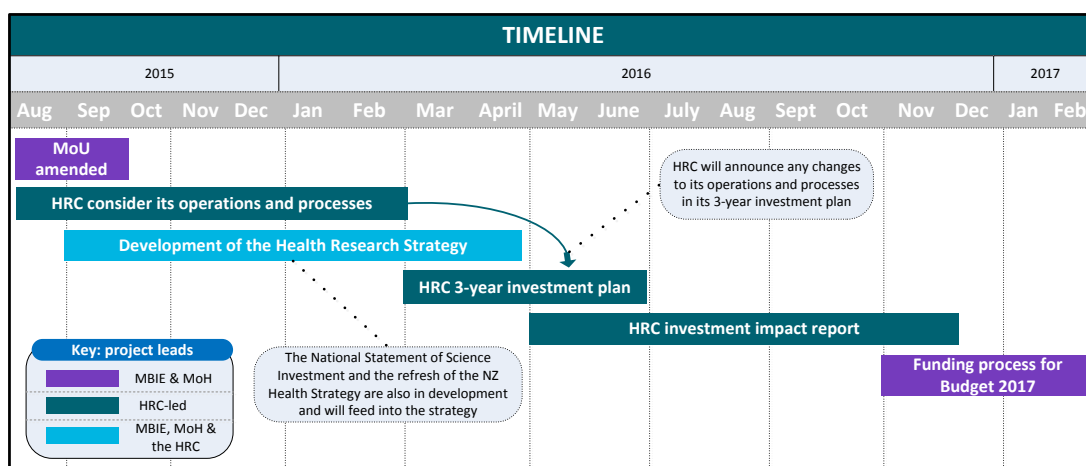
Recommendation 15 **Agree** that health research be a priority for funding increases in the context of government's commitment to raise science funding to 0.8% of GDP.

Recommendation 16 **Direct** MBIE and the Ministry of Health to develop, as soon as possible, a formal triennial process to set the level of HRC funding, drawing on the HRC's investment impact report.

Recommendation 17 **Agree** that the first round of the triennial funding process take place following the development of the health research strategy, but in time for any agreed funding increases to be reflected in Budget 2017.

Recommendation 18 **Agree** to increase operational funding from the 2016/17 year, to allow for the shift in focus and roles of the HRC, and to review this level in one year.

Timeline for key activities recommended



1. Introduction

This report presents advice to the Minister of Health and the Minister of Science and Innovation on the strategic refresh of the Health Research Council (HRC). Officials from the Ministry of Health and the Ministry of Business, Innovation and Employment (MBIE) have jointly undertaken the refresh of the HRC and prepared the advice and recommendations contained in this report.

Background to the Health Research Council

The HRC is the primary administrator of government funding for health research. It is a Crown agent (a type of Crown entity), established under the Health Research Council Act 1990 (the Act).

The HRC replaced the previous Medical Research Council (MRC), which had operated in various forms since 1920. The purpose of the MRC was to foster medical research and publish reports on medical research.¹ The board of the MRC was predominantly made up of those with expertise in medical or scientific research. It largely focused on funding biomedical research² of scientific merit. New Zealand's current research strengths in medicine are attributable in large part to the MRC's historical investment in this area.

The HRC was established in 1990 after consistent calls for increased funding for health research and a greater focus on public health research. The HRC's role was expanded from that of the MRC to include funding of public health and Māori health research, in addition to biomedical research. The change from the MRC to the HRC sought to build stronger links between health research and the health sector, and to enhance the focus on public benefit. The basic premise behind the establishment of the HRC was that 'any decision concerning the role of Government in funding biomedical and public health research is to identify the extent to which the public, as taxpayers or users of research, might benefit'.³ A focus on Māori health research was a third area where specific attention was considered warranted, due to the complex issues of accountability and cultural sensitivity raised by research in this area, and to ensure the HRC gave effect to the Crown's Treaty obligations.

In 1997 the Government announced that funding for the HRC would be transferred from Vote Health to Vote Research, Science and Technology. The intention of this transfer was to incorporate health research into an overall science envelope along with all other research sectors. The transfer aligned the funding model of the HRC to the full-cost funding model that the government had applied to the rest of the science sector.

The HRC is governed by a 10-member board appointed by the responsible minister, the Minister of Health. The membership is split equally between experienced health researchers and people with other skills and experience.⁴ The HRC's overall purpose is to 'improve human health by promoting and funding research'.⁵ The Act sets out a number of broad functions, including:

- i. advising the Minister of Health on national health research policy⁶

¹ Refer Medical Research Council Act, section 9(a).

² Biomedical research is the investigation of the biological process and the causes of disease. Under the HRC Act 1990, biomedical research is defined as 'research in the biomedical sciences relevant to human health; and research into the causes, consequences, diagnosis, and treatment of human illness'.

³ Stewart, Scott and McKay (1989), p. 21.

⁴ Community affairs, health administration, law, or management and knowledge of health issues from a consumer perspective.

⁵ Health Research Council Act 1990, section 4.

⁶ The Act does not specify, however, who has lead responsibility for health research policy or strategy.

- ii. administering funds to implement national health research policy
- iii. fostering the recruitment, education, training and retention of those engaged in health research in New Zealand
- iv. initiating and supporting health research.

The Act establishes three statutory committees – one each for biomedical, public health and Māori health research – which reflect the key areas of focus for the HRC. Over time, the HRC has established additional committees - such as the Pacific Health Committee - in particular areas which it considers need focus. These committees have similar functions and powers to the statutory committees.

The HRC manages the bulk of government investment in health research. The Tertiary Education Commission (through the Centres of Research Excellence funding mechanism), the Marsden Fund, MBIE, the Ministry of Health and district health boards (DHBs) also fund health research. Refer to Figure 2 on page 8 for a diagram of the current health research funding landscape.

The HRC uses a range of investment mechanisms⁷ (see Figure 5 on page 27). Since 2011 the HRC has channelled the majority of its investments through four research investment streams (RIS), which seek to cover all areas of human health and development (see Figure 1). Each investment stream has its own goals and priorities. Individual budget targets are attached to the health delivery and rangahau hauora Māori streams. The other two investment streams have a combined budget target.

Figure 1 HRC investment streams

Title and brief description of the Research Investment Streams	Budget target	2014 budget	2014 budget allocation
Health and Wellbeing in New Zealand: <i>Keeping populations healthy and independent throughout life</i>	70%	82%	\$67.2m
Improving Outcomes for Acute and Chronic Conditions in New Zealand: <i>Improving outcomes for people with illness or injury</i>			
New Zealand Health Delivery: <i>Improving health and disability service delivery outcomes over the short-to-medium term</i>	20%	13%	\$10.7m
Rangahau Hauora Māori: <i>Supporting Māori health research that upholds rangatiratanga and utilises and advances Māori knowledge, resources and people</i>	10%	4%	\$3.5m

Approach to the strategic refresh

Ministers are seeking to optimise the impact of the HRC and raise its profile and visibility. The Terms of Reference for the strategic refresh (see Appendix 6) outline that its objective is to maximise the contribution of the HRC to the Government’s broader health and economic goals.

The strategic refresh considered the:

- balance between health and economic priorities
- relevance of HRC-funded research to New Zealand
- balance and type of research funded
- alignment between the HRC and other funding mechanisms

⁷ This report refers to the HRC ‘proposal types’ as investment mechanisms.

- HRC's priority setting and funding processes
- governance arrangements for the HRC
- uptake and commercialisation of health research
- profile and visibility
- funding levels.

The advice presented has been informed by:

- analysis of HRC contracts (see Appendix 1), bibliometric data (see Appendix 2) and HRC documentation (see Appendix 3)
- an international scan of other health and medical research funding bodies⁸
- the relevant literature on health research, in particular, international studies on the impacts of health research (see Appendix 3)
- focus group discussions with health researchers (including Māori and Pacific researchers), DHB staff, the commercial sector and not-for-profit organisations; and semi-structured interviews with key stakeholders, including university management executives (see Appendix 4)
- individual structured interviews with each HRC board member
- written comments from stakeholders
- expert advice from two external advisors (see Appendix 5).

All contributions made by stakeholders through the focus groups, interviews and written comments were considered carefully. There was some commonality in the views expressed by different stakeholders and some strong recurring themes arose, in particular that the current level of funding for the HRC is too low. A list of the key themes expressed by stakeholders is attached as Appendix 7. While a number of consistent themes emerged from stakeholders, different views also emerged on particular areas. These often reflected particular stakeholder interests or perspectives. Some stakeholders also raised very distinct or specific views and suggestions. The information gathered for the refresh will help inform future work around health research policy and the HRC.

Focus of the strategic refresh

The strategic refresh began by examining the HRC and its operations, with a view to recommending a set of changes for the HRC directly. However, as the work progressed it became apparent that many of the matters that needed to be addressed were not fundamentally about the HRC and how it operates, but instead were a result of systemic issues, in particular:

- a weak strategic context within which the HRC is operating
- a lack of connection and coordination between the wide variety of actors in the health sector and the science and innovation system.

These issues, which cannot be resolved by the HRC alone, significantly restrict the strategic potential and impact of the HRC. Making changes solely to operational aspects of the HRC in isolation is unlikely to have a significant impact on the contribution of the HRC to New Zealand and government goals. The recommendations in this report are therefore aimed at addressing fundamental or systemic issues that are hindering the performance and operations of the HRC.

⁸ The Australian National Health and Medical Research Council, the Canadian Institutes of Health Research, the United Kingdom Medical Research Council, the United States National Institutes of Health and the Irish Health Research Board.

This report proposes a two-tier approach to change:

- addressing the fundamental systemic issues by establishing a more connected health research and innovation system
- addressing operational improvements to the HRC.

Officials have not identified any issues that require fundamental changes to the nature and functions of the HRC. Instead, the recommendations in this report are designed to empower the HRC to play a more strategic role within the health and science sectors, encouraging greater levels of connectivity, end-user engagement and research translation. The recommendations encourage the HRC to use the tools provided in the current legislation to play a more strategic role in the health research and innovation system.

The report begins with a context-setting chapter on health research in New Zealand. The subsequent chapters contain recommendations that set out a path to embedding health research into the health and science systems and maximising the contribution of the HRC.

2. Health research in New Zealand

Government primarily invests in health research to improve health outcomes

The government's main reason for investing in health research⁹ is to deliver better health outcomes for New Zealanders. These health outcomes include improved longevity and quality-adjusted life years, improved clinical practice¹⁰ and patient outcomes, reduced disease burden, elimination of certain sicknesses or diseases, and reduced inequalities in health outcomes and improvement of Māori health outcomes. To be effective, health research needs to be scientifically robust and usable, taking into account consumer and patient needs.

Health research is a global endeavour, with the vast majority of research conducted offshore. A key reason for investing in health research in New Zealand is to raise our capacity to quickly tap into the latest findings and use them. Health researchers in New Zealand can inform better decision making around health issues by assisting in translating global knowledge to local settings.

A healthier population also has major economic benefits through improving labour productivity and rates of labour utilisation. In addition, health research can lead to efficiency gains in the delivery of health services through the generation of innovative solutions. Research also has important links to clinical teaching: research improves the quality of teaching and raises the skills of clinicians. New Zealand's largest hospitals are teaching hospitals,¹¹ with relatively strong connections between health researchers and practising clinicians.

Selected impacts of HRC-funded research on New Zealand

- The *He Kainga Oranga Programme* proved the link between meningococcal disease and household crowding. This provided the evidence to support the *NZ Healthy Housing Initiative* and the *Warm-Up New Zealand: Heat Smart* initiative.
- The Liggins/Howie discovery of betamethasone to prevent lung disease in newborns is estimated to have directly saved the lives of about 10,000 New Zealand infants.
- The Bone Research Group at the University of Auckland has led to improvements in the treatment of osteoporosis.
- The Christchurch Health and Development Study proved the link between passive smoking and respiratory illness and provided evidence for the Family Start programme.
- The PREDICT CVD Risk Assessment support captures patient data in an anonymised format and is now used by 80% of Auckland and Northland primary health organisations.
- The New Zealand National Cot Death Study identified three modifiable risk factors for Sudden Infant Death Syndrome (SUDI), which saved more than 3000 New Zealand children's lives from 1990 to 2008.
- The Life and Living in Advanced Age Study (LiLACS NZ) has informed policy in areas such as transitions in care, balancing formal and informal care, falls and injuries, and service inequalities in New Zealand.
- An HRC-supported house surgeon showed that optimised care protocols for bariatric surgery reduced hospital stays to just one day with no increase in complications, which led to savings of around \$700 per patient.
- Pacific Edge, now listed on the NZX50, was built on HRC funding for genetics and the epigenetics of cancer.

⁹ In this report, health research includes medical research. Health research includes: (i) *biomedical research* – the investigation of the biological process and causes of disease; (ii) *public health* – the art of preventing disease, prolonging life and promoting health through organised efforts and better informed choices; (iii) *health services* – the examination of how people get access to health care services, and the cost and outcomes of that care; and (iv) *clinical research* – investigation into the safety and effectiveness of medications, devices, diagnostics products and treatment regimens intended for human use.

¹⁰ 'Clinical' refers to the range of health professionals, including doctors, nurses, pharmacists, allied health staff and public health practitioners.

¹¹ Auckland City Hospital, Christchurch Hospital, Dunedin Public Hospital, Middlemore Hospital, North Shore Hospital, Starship Children's Health, Waikato Hospital and Wellington Hospital.

Health research is therefore essential to the efficiency and effectiveness of the health system. In New Zealand, the main end users of health research are government-funded agencies, which receive \$15 billion of government investment per annum, or 6% of New Zealand's GDP.¹² The health sector¹³ is also rapidly growing: it is New Zealand's second-fastest-growing sector, with annual growth of 8.1%.¹⁴ The size and growth of the health sector heightens the need to find innovative solutions and continue to improve productivity.

Health research is important to the science system, economic development and the social sector

Health research is also important to the science and innovation system. New Zealand's reputation for excellence in health research and our international connectivity has reputational benefits as well as economic benefits through the contributions to our innovation system. As New Zealand is a biological economy with a large agricultural sector there are multiple benefits associated with investment in health research, particularly biomedical research. Devices, drugs and technologies developed in clinical medicine often have spillovers to New Zealand's biological sectors. For example, the Liggins/Howie discovery of betamethasone to prevent lung disease in newborns may have directly saved the lives of about 10,000 New Zealand infants. This breakthrough was based on sheep research and was supported by the HRC and its predecessor the MRC.

Health research can influence social, justice or education sector outcomes. For instance, the Dunedin Multidisciplinary Health and Development Study recently found an association between obesity and 'social jetlag' (the different sleep patterns between work days and weekend). HRC funded research which discovered the link between meningococcal disease and household crowding has also provided evidence to support the New Zealand government-funded *Healthy Housing Initiative* which is expected to improve social, education and health outcomes.

High-quality health research, particularly at the interface between biomedical, clinical and new technologies research, can lead to direct commercialisation benefits through the creation of innovative medical technology and biotechnology firms. For instance, the Bone Research Group at the University of Auckland has worked with global pharmaceutical companies to develop Zoledronate, a drug that has revolutionised the treatment of osteoporosis. The strength of the group is its mix of clinical and biomedical expertise enabling information to flow between the laboratory and the clinic.

Health services and systems around the world are expanding, giving rise to significant opportunities to generate commercial gain. New Zealand's largest grouping of high-tech manufacturing exports in 2012 was medical equipment and pharmaceuticals, which accounted for \$663 million of exports. Health-care firms within the TIN100¹⁵ generated \$1.3 billion in revenue in 2014, or 17% of the TIN 100 revenue. These firms are growing quickly: between 2006 and 2014 revenue grew by 89%. Health research also generates a significant share of universities' commercial revenue: for example, \$47 million (37%) of Auckland UniServices

¹² Health is the Government's second largest area of spending after social development, accounting for 18% of all government appropriations (New Zealand Treasury (2014)).

¹³ ANZSIC Classification Q: firms or organisations mainly engaged in providing human health care and social assistance. This includes hospitals, medical services, residential care, child care and counselling services. They may be publicly owned and operated, or privately owned and operated, either for profit or not for profit.

¹⁴ Between 2002 and 2012 the health sector added the most jobs (55,700) of any sector. It is New Zealand's second largest employer at 210,000 FTEs, or 9.1% of total employment (Statistics New Zealand data sourced in Ministry of Business, Innovation and Employment (2014)).

¹⁵ The TIN100 ranks New Zealand's 100 largest locally-founded, export-focused technology companies based on annual revenue.

revenue was derived from health in 2014. The HRC has funded much of the underpinning research.

Scientific quality of health research

Between 2010 and 2014, health research accounted for the largest volume of New Zealand's academic outputs at around 36%.¹⁶ In terms of scientific quality, New Zealand's health research compares well internationally. The average field weighted citation impact (FWCI) of New Zealand articles is above the OECD average in six of the eight health research journal categories. The FWCI for a third of the health research sub-categories is above the average of the Small Advanced Economies group.¹⁷ The publication category of medicine, which includes all areas of health research, is New Zealand's second-strongest-performing discipline when compared to OECD averages, on the basis of FWCI. The citation measures for many of the biomedical subcategories are particularly high (see Annex 2 for further details).

A number of unique factors raise the quality of health research and make New Zealand attractive as a health research destination. These include:

- a small, geographically isolated population
- a diverse demographic mix
- an efficient ethical review process
- rich health data, particularly patient-level information.

These factors provide researchers with an environment conducive to answering some of the more challenging questions in health research, such as how to reduce health inequalities between ethnic groups or at what stage in the lifecourse it is best to make specific health interventions. They also present New Zealand with the opportunity to attract international investors, researchers and companies seeking to undertake health research.

Performers and funders of health research

Total expenditure on health research in 2014 totalled \$299 million, or 11% of all research and development (R&D) in New Zealand. Comparing levels of health research and government funding of health research across countries is problematic due to differences in data collections,¹⁸ gaps in OECD data and differences in funding models. Analysis undertaken by New Zealand health researchers suggests that New Zealand government funding of health research is significantly lower than Australia, the United Kingdom and the United States.¹⁹ However, this analysis does not fully consider the differences in overheads between the comparator countries and the health research funded through other mechanisms, in particular institutional funding to universities. It also does not take into account the size of each country's research and science system.

The government is currently the primary investor in health research, which is appropriate given the public good nature of much of the research undertaken. Since the establishment of the HRC, the government has introduced new research funding mechanisms, such as the Centres of Research Excellence (CoREs) and the National Science Challenges (NSCs), which health researchers can access. However, the HRC remains the government's primary funder for health

¹⁶ This includes the categories of medicine (18%); biochemistry, genetics and molecular biology (8%); psychology (3%); immunology and microbiology (2%); nursing (2%); pharmacology, toxicology and pharmaceuticals (2%); health professions (2%); and dentistry (less than 1%) in the Scopus database. The database used included publications from 2010 to 2014.

¹⁷ Denmark, Finland, Ireland, Israel, New Zealand and Singapore.

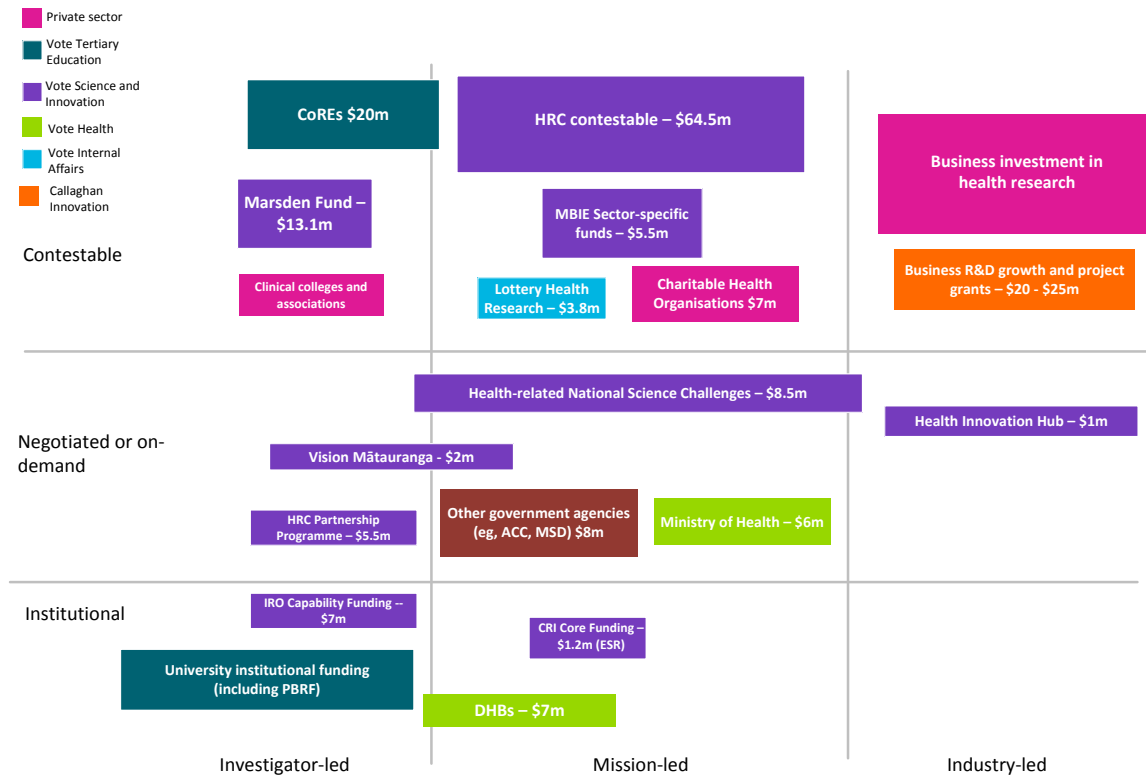
¹⁸ See, for instance, OECD (2001).

¹⁹ 3.4-fold lower than Australia, 4.5-fold lower than the United Kingdom and 9.7-fold lower than the United States (Reid *et al* (2014)).

research. Figure 2 below provides an overview of the funding landscape for health research in New Zealand.

Universities undertake the bulk of health research (60%) in New Zealand, but the private sector is performing an increasing share.²⁰ This share increased from 26% in 2012 to 30% in 2014. The R&D intensity of our health industries (that is, the ratio of R&D undertaken to revenue) is low compared to other countries, which is primarily because the focus of our pharmaceutical manufacturers is on producing and distributing generic drugs, rather than novel drug discovery.

Figure 2 Health research funding landscape



Sources: MBIE, HRC, Royal Society of New Zealand, Tertiary Education Commission (TEC), Ministry of Health, ACC, Department of Internal Affairs, charitable health organisation websites.

Notes:

1. The amounts invested by the Ministry of Health and other government agencies can vary significantly from year to year.
2. Figures for the HRC, the Marsden Fund, Independent Research Organisation (IRO) capability funding, MBIE sector-specific funds (High Value Manufacturing and Services, and Medical and Health Technologies), Vision Mātauranga, and Medical and Health Technologies, Vision Mātauranga, Lottery health research and the Health Innovation Hub are actual allocation or expenditure figures for the 2014/15 financial year.
3. The HRC contestable figure for \$64.5m excludes HRC-managed IRO capability funding support and the HRC Partnership Programme. The figure for the Partnership Programme includes co-funding.
4. The figure for the NSCs is an indicative annual figure based on the five-year appropriation for the three health and wellbeing-related NSCs (Ageing Well, A Better Start and Healthier Lives).
5. The figure for Lottery Health Research is expenditure for the 2013/14 financial year.
6. Figures for the CoREs are estimated from 2014/15 TEC contract data and information from the CoREs' websites.
7. Callaghan Innovation grants are estimated from 2014/15 Callaghan contract data.
8. DHB figures are taken from a Ministry of Science and Innovation health data collection conducted in 2012.
9. The figure for charitable health organisations is estimated from charities' websites.
10. The Environmental Science and Research (ESR) figure is estimated from ESR core funding reports to MBIE.
11. The figure for other government agencies is an estimate based on discussions with those agencies and the budget of the Social Policy Evaluation and Research Unit (Superu).
12. A figure for university institutional funding (including the Performance-Based Research Fund) and for clinical colleges and associations is unobtainable.

²⁰ R&D Survey 2014. The private sector includes businesses and independent research organisations.

3. Embedding health research into the health and innovation systems

Much of the improvement in longevity and reductions in disease burden in the 20th century have been generated from health research.²¹ The understanding of the human body, discovery of vaccines, development of new forms of treatment and changes in clinical care have been underpinned by sustained investment in health research.

Biomedical research has been central to advances in understanding of the human body, diseases and illnesses, and to the generation of treatments and cures. Public health research has identified how factors such as housing, passive smoking, air quality and access to health services influence health and well-being and actions that can address these factors. Clinical research has developed new approaches to health care and improved the effectiveness of medications, devices, diagnostics and treatment regimes. Research on health services has helped improve the accessibility of health services and has identified ways in which healthcare providers can use the new knowledge generated from other areas of health research.

In order to maximise the opportunities and generate greater impact, health research needs to be embedded into both the health sector and the wider innovation system. The overall finding of the strategic refresh is that the design of the HRC as an institution is generally fit for purpose,²² but the impact of the HRC is currently limited by a lack of connections and strategic alignment across the health and innovation systems.

The key recommendation of the refresh is that strategic alignment of, and connections between, actors in the health research system be improved, and that a health research strategy be developed to drive this change. The strategy will ensure the innovation pipeline operates more effectively from the identification of need through to performing R&D and use and dissemination of findings.

Need to strengthen connections and alignment in the health research and innovation system

An effective health research and innovation system requires strong connections and alignment between the relevant government agencies, health researchers, end users and the commercialisation sector. Figure 3 (overleaf) shows the main actors in New Zealand's health research and innovation system and highlights the key connections. Strengthening these connections will improve the impact of the government's investment in health research. For instance, stronger relationships and improved alignment will help line up research priorities and capabilities to address shared priority areas such as childhood obesity; improving the health of vulnerable groups in society such as lower socioeconomic groups, remote communities and prison inmates; or developing New Zealand's medical technologies sector.

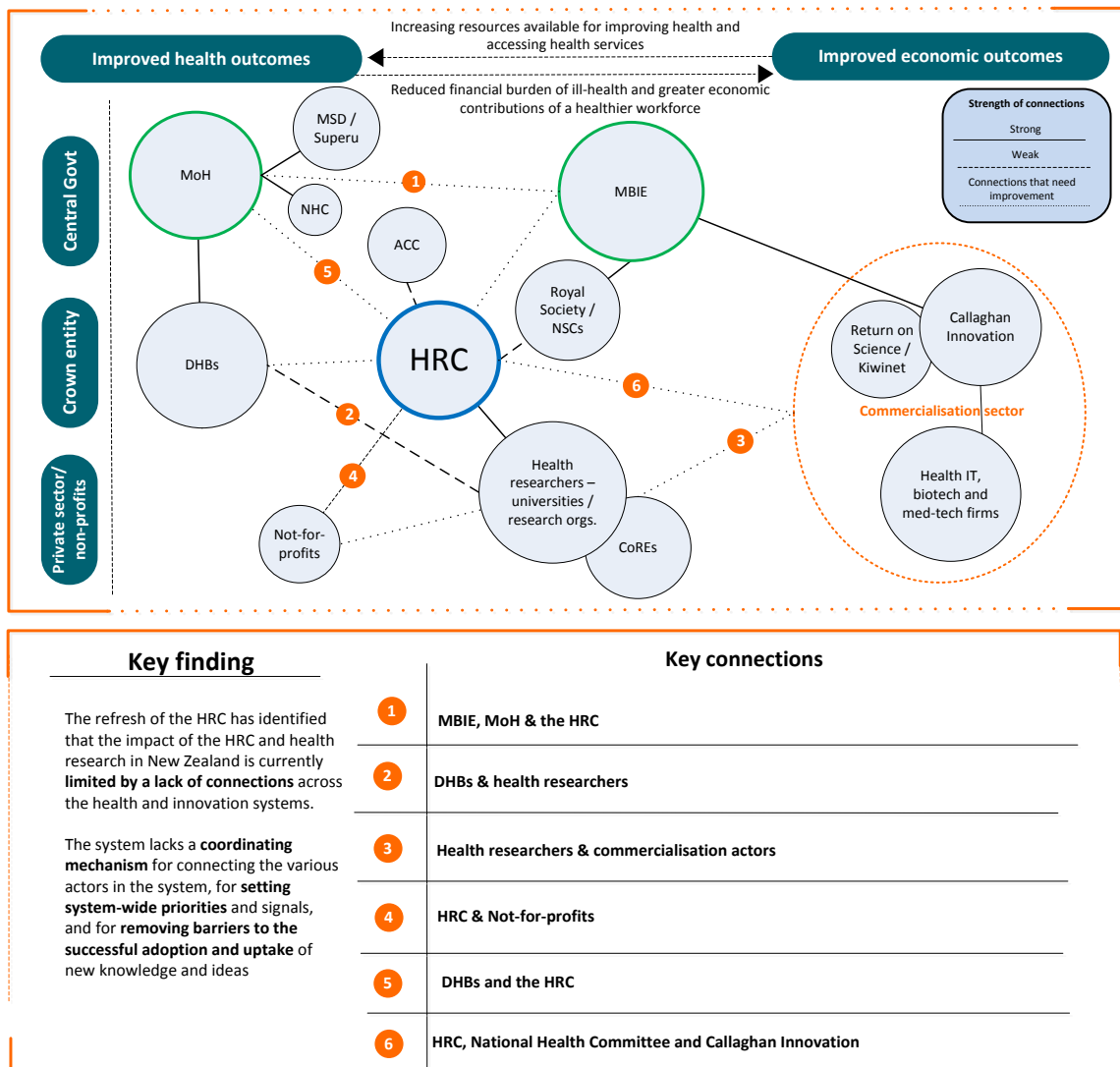
Strengthening connections is particularly important for ensuring rapid uptake and wide dissemination of health research results. Strong connections can encourage research to be adopted by health-care providers, and providers to influence research priorities, ensuring the usability and relevance of government-funded research. For instance, evidence-based medicine

²¹ Nine of America's most distinguished economists from the University of Chicago, Harvard University, Yale University, Stanford University and Columbia University found that improvements in health accounted for almost one-half of the actual gain in American living standards in the past 50 years (Funding First (2000)). They found that the likely returns from medical research are so 'extraordinarily high that the payoff from any plausible portfolio of investments in research would be enormous'. Since the middle of the 20th century gains are closely associated with declining mortality among the elderly, rather than reductions in infant mortality. Cutler and Kadiyala (1999) suggested that at least one-third, and perhaps as much as one-half, of the gains in quality of life and life expectancy since 1970 in the USA could be attributed to health research.

²² Discussed in Chapters 4, 5 and 6.

has the potential to improve both the prevention and treatment of diseases and shared decision-making between clinicians and patients. For this to occur, patients, clinicians, pharmacists, educators, producers of evidence, policy makers, research funders, researchers from a range of academic disciplines and industry must work together.

Figure 3 New Zealand’s health research and innovation system²³



For health research to influence what happens in the health sector it must provide usable findings: it needs to reflect the needs of those who are likely to use it. This requires a particularly strong relationship between those who fund and undertake health research and the broader health sector. End users also need to be equipped with the skills and capacities to effectively use the new knowledge and innovative solutions generated by health research from New Zealand and abroad. This is particularly important for New Zealand given that the overwhelming majority of health research results are generated offshore.

The mechanisms by which health research findings influence clinical practice, policy development and service design in New Zealand need strengthening. The role of health research in clinical settings and its place in DHBs also requires further consideration and clarification. For

²³ For simplicity, this diagram depicts the main institutions in New Zealand’s health research and innovation system. Other institutions, such as the Health Innovation Hub and the Department of Corrections, also form part of the system.

instance, a key issue is how to create better incentives for DHBs to continually adopt appropriate and cost-effective scientific discoveries as part of leading and developing smart health care organisations.

Auckland, Canterbury and Capital & Coast DHBs have sizeable research portfolios, which are closely connected to their large teaching hospitals and supported actively by their research offices. In other DHBs research has a lower profile. Many clinicians, particularly senior medical staff, have joint appointments with universities, which assists knowledge transfer and the uptake of new ideas. However, more could be done to ensure research is aligned to the needs of the health sector and the research results are effectively diffused across the health system.

Need to develop a health research strategy

To strengthen the connections and strategic alignment discussed above, officials recommend a health research strategy be developed. The strategy would set a cohesive, long-term vision for health research in New Zealand. It would provide a mechanism for bringing together the actors and agreeing on the key priorities and problems to be addressed over the next 10 years.

The health research strategy would aim to improve the strategic alignment and governance of health research. This would result in:

- a clear set of priorities for health research, through better coordination of key government agencies and stronger linkages with the wider health research sector
- stronger signalling from the Government to the HRC about its expected contribution to the Government's broader health, economic and social objectives
- clear lines of delineation and greater alignment between the various funding mechanisms for health research, in particular the research funded through the HRC, the health and wellbeing related NSCs and MBIE's contestable research fund which considers health outcomes only as secondary benefits
- a higher profile of health research and the HRC within government and across the health sector and innovation system.

The health research strategy would aim to further embed health research in the health sector. This would result in:

- greater end-user involvement in setting health research priorities and in assessing the potential impact and uptake of health research
- more research of relevance to the health needs of New Zealanders and the health system
- greater uptake of research results and wider dissemination of cost-effective interventions through the health system.

The health research strategy would aim to further improve connections between health research and the science and innovation system. This would result in:

- faster growth of New Zealand's medical technologies sector
- greater rates of commercialisation as the pipeline from HRC-funded research to the commercialisation arms of the innovation system operates more smoothly
- critical funding gaps being addressed where necessary, such as support for longitudinal studies and for research that does not clearly fit within existing funding arrangements.

The elements of a health research strategy

The health research strategy would set out:

- New Zealand's health research strengths, weaknesses, opportunities and threats
- those health conditions that present the biggest burden to New Zealanders, and the extent to which New Zealand research on the prevention and treatment of these conditions can contribute locally and to the global endeavour
- opportunities to improve New Zealand's health systems and processes through research
- the importance of addressing health disparities (gender, ethnic, socioeconomic and geographic) and how they can be understood and addressed through research
- long-term goals and medium-term health research priorities
- ways of increasing the uptake and dissemination of research results from New Zealand and offshore
- the role of DHBs and other health providers in performing and using research
- ways of capturing commercial gain from research results; in particular, biomedical research
- clear and measurable targets.

The strategy would align with, and be guided by, overall strategies within the health and science sectors; in particular, the National Statement of Science Investment (NSSI)²⁴ and the New Zealand Health Strategy.²⁵ The health research strategy is an opportunity to bring together the relevant signals from these overarching documents.

The strategy should also take into account the significant link between health research and social sector outcomes. Superu is leading work in the social sector to establish research priorities, and its work should inform – and be informed by – the health research strategy and the work of the HRC.

Many of the opportunities and challenges identified in the strategic refresh will be further considered as part of the development of the health research strategy

Development of the health research strategy

Ownership of the strategy would sit with the Minister of Health and the Minister of Science and Innovation. The Ministry of Health and MBIE, in close collaboration with the HRC, should develop the strategy. The three agencies will consult widely with relevant stakeholders on the content of the strategy.

The HRC has a critical role to play in the development and implementation of the strategy. Under the Act, the HRC is tasked with establishing formal mechanisms of liaison for the purposes of developing a national health research strategy.²⁶ It is proposed that the HRC work in partnership with the Ministries and use its strong networks in the health research sector to:

- contribute to the development of the strategy, in particular by playing a leading role in consultation with stakeholders

²⁴ The National Statement of Science Investment sets out the Government's future direction for, and coordination of, science investments in New Zealand.

²⁵ The New Zealand Health Strategy is currently being refreshed, and this is being informed by a Review of Health Sector Funding and a Review of Capabilities and Capacity of the Health Sector. Two other key strategies in the health and disability sector are the New Zealand Disability Strategy and He Korowai Oranga (the Māori Health Strategy).

²⁶ Section 34(2).

- identify emerging issues and developments in health research that could influence the direction or content of the strategy
- spearhead the implementation of the strategy by embedding it in its own ways of working and advising other agencies on how to implement the strategy.

The development of the health research strategy will enhance connections between government agencies. It is important that these links continue into the everyday work of agencies when they are considering commissioning, funding and the use of health research. This will help to foster cross-agency responses to government priorities.

The health research strategy and direction of the HRC

In the absence of a clear strategic context the HRC's investment approach has focused mostly on the quality of the science, with limited consideration of relevance and impact for New Zealand. The HRC has developed very broad investment signals to guide its allocation process, but these are not particularly well suited for responding to the health needs of New Zealanders and the needs of the health system.

The lack of guidance has resulted in the HRC not focusing on reporting adequately on the benefit for New Zealand that has been achieved from its investments. A strategy that sends clear signals on priorities is expected to put agencies in a better position to report on the impact of their investments.

In support of the strategy, the HRC should develop three-yearly investment plans for its research funding. The plans would be similar to the science investment plan envisioned for MBIE's contestable research fund. The HRC investment plan would set out a portfolio approach to contributing to the objectives of the health research strategy. HRC's investment plan will include:

- how HRC would give effect to the health research strategy
- funding priorities by investment mechanism and research area
- the rationale for each of the investment mechanisms
- the funding proportions across the mechanisms and the rationale for these proportions
- the HRC's approach to impact assessment of research proposals
- how the HRC can contribute to Vision Mātauranga²⁷ outcomes.

The HRC should develop the investment plan in consultation with the Ministry of Health and MBIE. The approach in the three year investment plan would be reflected in HRC's Statement of Intent.

Recommendation 1 **Agree** that the overall design of the HRC is appropriate, and that systemic improvements are needed to more effectively embed health research into the health sector and innovation system, and to achieve greater value and impact from the HRC's research investment.

Recommendation 2 **Direct** the Ministry of Health and MBIE, in close collaboration with the HRC, to establish a 10-year health research strategy which will recognise the centrality of health research to both the health sector and the science and innovation system.

²⁷ MBIE's Vision Mātauranga policy aims to unlock the science and innovation potential of Māori knowledge, resources and people.

- Recommendation 3** **Agree** that the health research strategy will:
- (i) align with health and science systems strategies, in particular the New Zealand Health Strategy and the National Statement on Science Investment (NSSI);
 - (ii) seek to better connect health researchers and end users;
 - (iii) signal the importance of health research to health outcomes and service delivery;
 - (iv) clarify the roles of the actors in health research and innovation;
 - (v) signal medium- to long-term health research priorities;
 - (vi) align health research funding mechanisms to maximise impact on health and economic outcomes.
- Recommendation 4** **Agree** that, following the completion of the health research strategy, it is appropriate that the HRC develop three-yearly investment plans that articulate the HRC's investment priorities and portfolio approach, and that the investment plans be reflected in the HRC's Statements of Intent.
- Recommendation 5** **Direct** the Ministry of Health and MBIE to monitor the implementation and progress of the health research strategy and three-yearly investment plans.

4. The role of the HRC

Since its establishment, the HRC has focused its attention on running robust contestable processes for funding high-quality health research. It has carried out this function well. However, the Act allows the organisation to play a broader role in fostering and leading an effective health research and innovation system in New Zealand, a role that goes beyond simply administering funds. The functions set out in the Act are still pertinent and do not need revision.

The HRC's broad legislative functions and its strong relationships with key parts of the health research sector mean it has a unique and strategic role to play in New Zealand's health and innovation systems. The three areas where it is considered the HRC can have the most impact are:

- providing strategic leadership in the health research sector
- funding excellent research with the potential for high impact
- fostering a strong health research workforce.

There are opportunities for the HRC to strengthen its leadership, visibility and impact within its current legislative mandate. The HRC's legislation empowers the HRC to play a broad and critical role in health research in New Zealand. The strategic refresh, and development of the health research strategy, provide the HRC with the opportunity to make full use of its legislative mandate, and to be a key strategic leader in the health sector and science and innovation system. The HRC has advised that given its unique position it has been keen to take on such a wider strategic role, but that limited funding has restricted its capacity to do so.

While improving health outcomes is the primary focus for HRC-funded research, health research can also contribute to other outcomes, such as social and economic outcomes. It is important that the HRC is connected to the wider innovation system and is playing a part in the commercialisation pipeline where it can. Focus group discussions with health sector firms highlighted the importance of improving this connection. There were a variety of views among stakeholders about the extent to which the HRC should be involved in the commercialisation space.

A variety of organisations and programmes – such as MBIE, Callaghan Innovation, the Pre-Seed Accelerator Fund, university technology transfer offices, Kiwi Innovation Network (KiwiNet) and Return on Science – are already focused on generating commercial gain from research. Therefore commercialisation should not be a key focus for the HRC. However, establishing greater connections between the HRC, Callaghan Innovation and MBIE will ensure HRC-funded research moves along the commercialisation pipeline when the opportunities present themselves. The HRC can play an important role in identifying where bottlenecks occur and working with other agencies to resolve them.

Providing strategic leadership in the health research sector

The HRC has the potential to be an influential leader on health research issues, operating as a key organisation at the heart of a vibrant and growing health research and innovation sector. The Act empowers the HRC to provide advice on health research policy, and to build strong relationships within the health research sector. The results of the research that it funds can inform and influence policy, and medium- and long-term government goals.

The HRC can increase its leadership within the health research and innovation sector by:

- working in close collaboration with the Ministry of Health and MBIE to contribute to the development of the health research strategy
- championing the health research strategy – spearheading its implementation and engaging with the health research community on the strategy
- being a repository of knowledge and understanding for health research in New Zealand, and a knowledge base on health research issues
- facilitating connections and links with end users and the health research community
- further develop international partnerships, including joint investment opportunities
- promoting and disseminating the results of health research to: increase understanding of how health research influences health and economic outcomes; influence policy and practice; and encourage end user uptake.

The final function listed above is one the HRC has not traditionally seen as a high priority, yet this function is essential to ensuring effective use of research and broadening the health research sector. The HRC has strong connections to parts of the health sector, but its strongest profile and funding activity is with Auckland and Otago Universities (and clinicians with connections to those universities). Discussions with stakeholders highlighted that other agencies in the innovation and health systems and not-for-profit organisations have a limited understanding of the HRC and what it does. It also means that the benefits of health research, and the impact that HRC-funded research has on New Zealand, are not well understood.

The HRC should consider developing a communication strategy (and communication mechanisms) to help address these gaps. It is important that any potential for user uptake in research is realised, and that opportunities for valuable research are not lost. Communications that send clear messages about the health, social and economic impacts of health research are also needed. The HRC advises that it is currently developing a communications strategy.

In its new leadership role the HRC could play a part in clarifying the investment mechanisms available to health researchers. This could include the HRC working closely with MBIE to enhance understanding of the nature of the health and wellbeing-related NSCs, how these fit into the broader science sector, and the relationship of NSCs to other research investments.

Funding excellent research with the potential for high impact

The basic areas of focus the Act sets out for the HRC (biomedical, public health and Māori) are still relevant. In addition, the HRC has recently responded to signals from the health sector on the importance of funding research on New Zealand's health system and service delivery by establishing the health service delivery investment stream.

The health research strategy and three-yearly investment plan will set broad parameters for HRC investment. The HRC needs to fund research which is excellent and has the potential to generate significant impact for New Zealand. This will require maintaining a balance in its investment portfolio between research that contributes to the global endeavour placing New Zealand on the world stage, and research unique to our local context that will not be conducted elsewhere, such as on our health service delivery system.

Striking an appropriate balance between these types of research will ensure New Zealand researchers continue to make valuable contributions to the global scientific endeavour and New Zealand continues to capture the benefits of world-class health research. At the same time this balance will ensure health research is responsive to New Zealand's health needs and local context. The mechanisms the HRC uses to fund research are likely to be a mix of current mechanisms and new approaches.

Examples of research that might be particularly relevant to New Zealand include:

- biomedical and public health research that could help reduce the impact of health conditions that currently cause a large burden of ill health and disability in New Zealand
- biomedical research of particular relevance to Māori and Pacific populations
- public health research that considers New Zealand's particular environment and social context
- research with the potential to reduce health inequalities and disparities across New Zealand's diverse demographic and population groups, paying particular attention to the needs of the Māori and Pacific populations
- research with the potential to improve New Zealand's health system and health service delivery
- research niches that New Zealand can exploit because of its size and unique characteristics, such as demographic composition and good health data.

Strengthening the impact assessment of research proposals

Since 2011 the HRC has been taking impact into account when assessing applications for funding. However, in order to ensure that more HRC-funded research is relevant and of high potential value to New Zealand, the assessment of impact needs to be further strengthened. The goals against which impact is assessed do not currently refer to a pathway to impact,²⁸ and a number of the HRC's current impact goals are not tied to addressing impact for New Zealand, but rather to the advancement of scientific knowledge in general.

The assessment of engagement with end users, including consumers, could also be strengthened. Pathway to impact, particularly for strategically-driven research, is needed to demonstrate that the research can potentially lead to benefit to New Zealand. This will involve consideration of health outcomes and, potentially, secondary economic outcomes. An important consideration is how the research may affect health inequalities. Pathways to impact demonstrate a potential use or market for the research results and show which partners are needed to bring about the uptake.

Finally, while the make-up of the HRC's assessment panels is well suited to assessing scientific quality, they are less suited to the assessment of impact, which requires significant end-user engagement. To enhance impact assessment, both the criteria for assessing and scoring research project proposals and the assessment panel process need to be examined. This could include assessing impact through a dedicated panel with a mix of scientists and end users. These changes should be signalled in the HRC's investment plan in 2016.

Fostering a strong health research workforce

A strong message from the focus groups, stakeholder meetings and external advisors during the refresh process was the need for HRC to invest directly in New Zealand's health research workforce.

The HRC currently fosters the health research workforce through providing direct workforce capability support (e.g., through scholarships and fellowships). The HRC already plays a strategic oversight role in respect to the health research workforce in New Zealand. Since 2002 it has been gathering data on the workforce and identifying areas of need both in terms of careers stages and research areas. The HRC produces an Annual Workforce Data Analysis report which it discusses with key organisations, such as universities.

²⁸ The HRC's peer review manual refers to 'pathways to knowledge transfer' as an additional consideration to the impact goals of the investment streams, but no guidance is given as to how to interpret or assess this.

The health research strategy will provide a helpful framework for assessing critical areas of need in the health research workforce by identifying priority areas. This assessment should include consideration of:

- how best to support the academic researchers and health professionals beyond medically trained researchers, such as nurses, pharmacists and those with public health expertise
- the role of DHBs in supporting the development of the health research workforce
- the growing international nature of the health research workforce.

Some clinical colleges and health professional associations already have a role in the development of the health research workforce through funding research projects, scholarships and fellowships. Health Workforce New Zealand (HWNZ) is another agency with an interest in this area. The HRC is currently working with HWNZ to identify where the two agencies could co-invest in supporting research career development, particularly for allied health professionals.

The HRC provides direct support to the health research workforce by awarding a variety of grants and fellowships. This support totalled \$8.3 million in 2014, or approximately 9% of the HRC's health research investment (see Figure 5 on page 27). HRC's workforce support focuses on increasing the diversity of the health research workforce, for instance building Māori health research capacity; or where a specific need or opportunity has been identified, such as support for clinician researchers. A diverse health research workforce is important so that the perspectives, understanding and health needs of the variety of population groups in New Zealand are considered and incorporated into the design and focus of research studies.

The HRC funds grants and fellowships including for Māori and Pacific graduates. Support for Māori and Pacific health researchers currently accounts for 20% and 14%, respectively, of the HRC's total workforce support.²⁹ Most of this support is for doctorates and post-doctoral research projects. Despite the investments in the Māori and Pacific research workforces, the number of funded applications with Māori or Pacific primary investigators remains low (see Figure A7 and Figure A11), and only one programme grant has ever been awarded on Māori research. Given the importance of these groups to New Zealand, it is vital that the HRC should continue to explore how best to increase its support to these researchers.

If there are other areas identified where there is a need for a more diverse health research workforce, the HRC should consider how best these needs can be addressed. In doing so, the HRC should bear in mind that it has other mechanisms that influence the capacities in the sector. For example, assessment criteria for project and programme applications could consider the extent to which an application will help develop a diverse health research workforce and nurture emerging talent.

Many researchers in the focus groups suggested that the HRC should fund a wider variety of workforce support, including fellowships and support for mid-career researchers. They compared HRC with overseas funders, such as Australia's National Health and Medical Research Council, which runs fellowship schemes from early stage through to professorial level. Participants suggested this was a gap in New Zealand that the HRC could fill as it had done in the past.³⁰

²⁹ Clinical training makes up 26%. The balance of workforce support is untargeted.

³⁰ The transfer of funding for the HRC to Vote Research, Science and Technology, included the agreement that tertiary institutions take over responsibility for training awards for biomedical, clinical and public health research (HRC Annual Report for the year ended 30 June 2002).

The HRC has a strategic role to play in New Zealand's health research capability. This includes:

- identifying and monitoring health research workforce capability and capacity issues across the system, including emerging areas of need
- identifying ways to respond to these needs and opportunities, and coordinating action across relevant stakeholders
- investing in those areas where the HRC can add significant value or where individual institutions may underinvest, such as further developing Māori and Pacific health research capabilities.

While the HRC has an important strategic role to play, addressing health research workforce needs should not be the sole responsibility of the HRC. The HRC needs to work closely with individual institutions, in particular the universities, DHBs and independent research organisations, to foster a strong and diverse health research workforce. This may also involve the HRC providing direct support to individual researchers at various stages of their careers.

Implications for the HRC and its organisational structure

Undertaking the roles discussed above does not require any significant organisational change for the HRC. The stability of the HRC secretariat has been of real benefit to the organisation. 2015 has been a time of considerable change in leadership for the HRC, with the recent appointment of a new chief executive and chief financial officer and the expected replacement of a number of board members as their terms expire throughout the year. The new approach that is being suggested is timely, occurring at a time when the leadership of the organisation is also being refreshed.

Recommendation 6 **Agree** that the key roles the HRC should focus on are:
(i) providing strategic leadership in the health research sector;
(ii) funding excellent research which has the potential to generate significant impacts for New Zealand;
(iii) fostering a strong and diverse health research workforce in conjunction with universities, district health boards, independent research organisations and other statutory and non-government agencies, and increasing its support for Māori and Pacific researchers.

Recommendation 7 **Agree** that it would be appropriate for the HRC to lift its profile by developing a communications strategy to ensure: clear messages relating to the benefits to New Zealanders of health research as well as the impacts of HRC-funded research; the potential for user uptake in research is realised; and opportunities for valuable research are not lost.

Recommendation 8 **Agree** that, once the health research strategy has been developed, it would be appropriate (i) for the HRC to strengthen its assessment of impact by: requiring pathways to impact, increasing the weight of the impact criterion, shifting the impact criterion towards direct benefit to New Zealand, and considering assessing impact through a dedicated panel with a mix of scientists and end users; and (ii) that this change be signalled in its first three-year investment plan.

5. Governance of the HRC

This section covers the governance arrangements for the HRC, including the composition and size of the board, the legislative functions, ministerial responsibilities and departmental monitoring arrangements and processes. Officials have examined the legislation, board appointment processes and practices, accountability arrangements and documents, and monitoring and reporting arrangements. Fundamentally, the overall governance framework for the organisation is sound: no issues have arisen that signal a need for significant change. However, some improvements can be made to strengthen processes and practices, and to enhance governance arrangements and the way in which key strategic documents are developed.

HRC board

The HRC is governed by a board of 10 members appointed by the Minister of Health: five members with active engagement in health research, and five members with skills and experience in areas such as community affairs, health administration, law, or management or knowledge of health issues from a consumer perspective.

With 10 members the board is a relatively large governance body. However, the board plays a critical role in setting the direction of the HRC and securing high-quality performance, so it is important that there be enough members to ensure the board has the right mix of skills and experience (such as financial and legal acumen). The number of board members also needs to be sufficient to allow for statutory committee members and chairpersons to be appointed.

The current number of board members allows for diverse research interests (such as biomedical, public health and Māori health) to be represented, while ensuring a balance of layperson and researcher representation. The presence of sufficient appropriately skilled laypersons is essential to ensuring health research remains responsive to end-user needs, and general governance-related expertise requirements are met. Membership of the board should be responsive to the diversity of populations in New Zealand, particularly populations with poor health outcomes. The practice of appointing a lay person as the chair is a valuable one that should continue.

Legislative functions of the HRC

The Act, which established the HRC, provides a list of functions the HRC may undertake.³¹ The functions set out in the Act are broad, and are capable of allowing the HRC to play an effective, enduring role in the health and science and innovation systems. No need for legislative change to these functions has been identified.

The HRC's approach to discharging its functions has, however, lacked strategic focus and become mostly transactional, focused on funding processes. This is in part a reflection of the lack of a framework or vision of how health research relates to the overall goals of the health and science sectors. The recommendations contained in previous chapters of this report should go some way to addressing this issue.

³¹ Among the functions included in the legislation are: provision of advice on health research policy, administration of funding to implement health research policy, initiating and supporting health research, promoting and disseminating the results of health research, and fostering the recruitment, education, training and retention of those engaged in health research. In addition, under the Crown Entities Act 2004 (section 14(1)), the HRC can do things related to or incidental to these functions, if they are in accordance with its objectives, and additional functions can be conferred on the organisation under section 112 of the same Act.

Statutory and standing committees

The inclusion of committees as a statutory requirement is beneficial to emphasising the desired focus of the HRC. The current statutory committees established by legislation remain relevant. It is worth noting that the legislation does not prevent the HRC establishing additional committees to assist it in other priority areas. The HRC has established such a committee (a 'standing committee') for Pacific health research, for example. The development of the health research strategy should reveal benefits of additional or amended committees.

An HRC ethics committee was also established under the Act. This is one of a number of ethics committees in the health and disability system. The National Ethics Advisory Committee (NEAC)³² is currently reviewing New Zealand's ethics committee arrangements and its ethical guidelines for health and disability research. Some changes were made to the Health and Disability Ethics Committees (HDECs) as a result of a Health Select Committee inquiry in 2011. These changes were aimed at making the HDEC review system simpler, consistent and more efficient.

There is still some confusion in the New Zealand research community about the roles of the various ethics committees and guidelines, and potentially some gaps in applying for ethics approval. Earlier this year, NEAC completed public consultation to inform its review of cross-sectoral ethics arrangements for health and disability research. No change to the current ethics committee structure within the HRC is suggested at this stage, but further consideration may need to be given to whether change is needed in light of NEAC's final advice. The HRC has been, and should continue to be, involved in the NEAC work as it progresses.

Ministerial responsibility

Under the Act the Minister of Health is the responsible Minister for the HRC. The Minister of Health provides input into the development of HRC strategy and accountability documents and is responsible for appointments to the board. As the funding Minister, the Minister of Science and Innovation also has an interest in the HRC: the large pool of funding the HRC administers is appropriated through Vote Business, Science and Innovation, for which the Minister of Science and Innovation is responsible.³³

The dual ministerial responsibility arrangement acknowledges that health research is important to both the health and science systems. Health research plays a valuable role in improving health outcomes and the delivery of health services and is part of the wider science and innovation system.

Given the role that health research plays in both sectors, a dual ministerial accountability arrangement for the HRC is appropriate. The Minister of Health needs to ensure health research funded by the HRC is connected to the health sector and responsive to the health needs of New Zealanders and the health system. The Minister of Science and Innovation needs to ensure the HRC is part of a cohesive research system,³⁴ that an appropriate balance of basic and applied research is supported across the system, and that the economic benefits of health research are captured.

Officials considered whether the HRC should receive an appropriation for research funding through Vote Health in addition to that received through Vote Business, Science and Innovation. This would specifically recognise the part that health research plays in the delivery of health outcomes and to improving health service delivery. However, a dual appropriation arrangement

³² Cross-sectoral ethics arrangements for health and disability research: Discussion document, 2014.

³³ The transfer from Vote Health to Vote Research, Science and Technology occurred in 1997.

³⁴ For instance, the full-cost funding model needs to be applied consistently across the science system.

could exacerbate coordination issues and could lead, for example, to conflicting signals about priorities. It could also significantly increase transaction costs for the HRC by creating two streams of reporting and could reduce the HRC's flexibility to shift funds between priority areas. There are other levers that could be used to embed health research in the health system. For instance, the New Zealand Health Strategy could recognise the important role health research plays in the health system and this would flow through into the proposed health research strategy. There are likely to be other mechanisms and signals that can be used once there is an agreed health research strategy.

The relationship between the two Ministers is governed by a memorandum of understanding (MoU), which dates back to 2001. The MoU is very functional, setting out the roles and specific responsibilities of each Minister but not why both Ministers have a role. However, it contains no indication of the importance of health research to either the health sector or the science and innovation system. Further, it is outdated, containing reference to material that is no longer in effect.

Given the deficiencies of the MoU, it should be amended to reflect the importance of health research for both the health and science sectors. It is suggested that changes include (i) the Minister of Science and Innovation participating in discussions and decisions about the HRC and its strategic direction; and (ii) both Ministers to be involved in the process of setting the funding level of the HRC. Such changes are also likely to lead to a more seamless experience for the HRC when interacting with the Ministry of Health and MBIE.

Monitoring arrangements and departmental relationships

The nature of the relationship of the HRC with its monitoring departments (the Ministry of Health and MBIE), and the processes and relationships between the departments themselves, are expected to be strengthened and improved through the suggested amendments to the MoU. At present the relationships are transactional, focused on satisfactory compliance with separate output agreement requirements.

With both Ministers continuing to have some responsibility for the HRC, each will continue to need assurance that the HRC is operating in accordance with their expectations. This assurance will be provided to each Minister by their own department. However, a clearly articulated strategic direction and improved connections between the Ministry of Health and MBIE should result in a more coordinated approach to output agreement development and arrangements, and a joint approach to departmental reporting requirements and monitoring practices. For the HRC, this should result in a more seamless monitoring experience, where it is less apparent that there are two different departments involved in monitoring its performance.

Strong connections need to be built between the two monitoring departments, and between the departments and the HRC. The strategic refresh of the HRC has helped to cast light on the importance of health research to both agencies, and led to increased communication about processes, practices and knowledge sharing between the Ministry of Health, MBIE and the HRC, at both the operational and the strategic level. This momentum created by the refresh should not be lost.

Investment impact reporting

The Government increasingly considers whether its investments are yielding value and delivering impact. There is therefore a need to lift the profile of the HRC, and the research it invests in, within both the health and science sectors. The HRC's current investment impact report is a big step in the right direction because it contains some excellent examples of where health research has led to direct benefits for New Zealanders (see box on page 5).

However, there is still room for the HRC to improve its reporting. The HRC should focus on showing clearly the relationship between the work it funds and achievement of the strategic outcomes within the health and science sectors. The HRC could also better articulate its contribution to whole-of-government outcomes, such as those contained in Better Public Services targets. The primary vehicle for communicating these results would be a comprehensive three-yearly investment impact report. It is proposed this inform a formal process for negotiating and setting the funding level for the HRC every three years (refer Chapter 7).³⁵

Recommendation 9 **Note** that a change to the ethical framework or processes of the HRC may be desirable in future, pending the findings of the National Ethics Advisory Committee’s review of cross-sectoral ethics arrangements and development of new ethical guidelines.

Recommendation 10 **Request** the HRC to prepare, every three years, a comprehensive investment impact report which shows how the work it funds has contributed to achieving health, social and economic outcomes for New Zealanders.

Recommendation 11 **Agree** that the MoU between Ministers be updated to:

- (i) reflect the importance of health research to both the health sector and the science and innovation system;
- (ii) specify a process for the Minister of Science and Innovation to be involved in giving strategic guidance to the HRC;
- (iii) reflect involvement of both Ministers in the process of setting the funding level of the HRC; and
- (iv) specify that the HRC will provide a comprehensive investment impact report every three years to report on impacts and inform future investment.

Recommendation 12 **Note** that the strategic refresh has led to increased communication about processes, practices and knowledge sharing between the Ministry of Health, MBIE and HRC at both operational and strategic levels.

³⁵ The investment impact report would also provide useful information for the *Science and Innovation System Performance Report*.

6. Operations and processes of the HRC

The HRC is a well-run, efficient organisation with robust and largely transparent science quality assessment processes. Researchers and those who work with the HRC, such as its co-funding partners, generally regard the HRC to be responsive and efficient. One university reported the HRC to be its 'preferred funder' due to its efficiency and robust processes.

Some stakeholders also made comments and suggestions about how the HRC could improve its processes and make these more transparent. In addition, analysis of HRC data has indicated trends where improvements could be made. MBIE is currently reviewing its own contestable funding processes. There is benefit in HRC and MBIE sharing knowledge and learning from one another on science contestable funding processes.

This chapter sets out some of the observations from the strategic refresh, with a view to informing the HRC about the areas it might consider in order to make operational improvements in the future. Some of these suggestions could be implemented immediately, while others could take place following the health research strategy. The HRC has already initiated an internal audit of some of its processes to manage issues such as conflict of interest and potential bias in research selection processes.

The HRC has continually looked for operational improvements and has implemented efficiency gains: for instance, it introduced a two-stage assessment process for projects, which has lowered transaction costs for researchers and reduced the administrative burden for the secretariat. Over the last six years the HRC has reduced its operating costs by 18% in real terms and reduced full-time equivalents by 16%. The HRC should continue to look for opportunities for cost savings and efficiencies, such as exploring the possibility of virtual science assessing committees.

Processes and criteria for the selection of research contracts

On the whole, the HRC's processes and criteria (see Figure 4) for the selection of research contracts are largely considered to be transparent and robust. Researchers spoken to in the focus group discussions and the written comment received emphasised that HRC processes are trusted and that, in general, the best-quality research is funded. Bibliometric analysis shows that HRC-funded health research is of higher quality than that funded through other organisations.³⁶

The rigour of HRC's assessment processes lies in its committee structure and assessment of scientific quality. Currently, eleven science assessing committees assess programme and project proposals: four biomedical, three public health, two clinical trials, one Māori and one health services delivery. Programme proposals are then assessed by the Programme Assessing Committee, which takes into consideration the spread of disciplines in the applications to be assessed. Feasibility studies and emerging research grants have their own science assessment committees.

³⁶ Health Research Council bibliometric study (forthcoming).

Figure 4 Assessment criteria for projects and programmes

Health & Wellbeing and Acute and Chronic Diseases	New Zealand Health Service Delivery	Rangahau Hauora Māori
<p>25% <i>Rationale for research</i> Addresses a significant health issues important for health/society; the research should be original and address a knowledge gap</p>	<p>25% <i>Rationale for research</i> Importance of issue for health; potential to address an important knowledge gap</p>	<p>25% <i>Rationale for research</i> Addresses a significant health issue important to Māori; research will build on existing knowledge, develops Māori health knowledge</p>
<p>25% <i>Design and Methods</i> Comprehensive design & achievable within the timeframe; awareness of statistical considerations; sound data management</p>	<p>25% <i>Design and method</i> Appropriateness of research design and methods chosen</p>	<p>25% <i>Design and Methods</i> Demonstrates an awareness of Māori health research processes and Māori ethics processes; partners with, and is responsive to, the needs of Māori stakeholders; dissemination plan</p>
<p>25% <i>Research impact</i> Advances an investment streams goal; contributes to increased knowledge, health, social and/or economic gain; pathways for knowledge transfer</p>	<p>20% <i>Impact on NZ Health Delivery</i> Potential for positive impact on the health and disability sector with the next 5 years</p>	<p>25% <i>Research impact</i> Positive impact on knowledge, social, health and/or economic outcomes for Māori; appropriate dissemination and uptake plans; contributes to Māori health research capacity</p>
<p>25% <i>Expertise and track record of team</i> Appropriate qualifications and experience; right mix of expertise; good networks & collaborations; history of delivering results</p>	<p>20% <i>Team capability – outcomes</i> Right expertise and connections with the health sector; history of delivery</p>	<p>25% <i>Expertise and track record of team</i> Appropriate expertise and experience; right networks and connections and a history of delivery.</p>
	<p>10% <i>Team capability – uptake</i> Right expertise; dissemination plan; networks for knowledge transfer and uptake</p>	

Source: HRC Peer Review Manual (2014).

Notes: The description of each criterion is not comprehensive. The HRC peer review manual contains the full description.

Programmes are scored against an additional criterion of ‘cohesiveness of research programme’, which receives a weighting of 20%.

The committees are made up of 5–12 active health researchers, with the exception of the Māori and health services delivery assessing committees, which have two or three end users on the panel in addition to health researchers. The HRC draws heavily on Australian-based panel members to increase independence and rigour. For instance, Australian-based panel members made up 66% of biomedical science assessing committee members for 2014/15 and 40% of public health committee members. The HRC also draws extensively on local panel members to ensure the New Zealand context is fully understood.

Many stakeholders noted that the HRC has fewer difficulties than other funding agencies in securing high-quality referees and reviewers due to its reputation for quality processes. The committee members score proposals and receive reports on the scientific quality and health impact³⁷ from three to four external referees, who are mostly international.

The processes of appointment and ensuring appropriate representation on panels are important to a robust process. Information on the selection process and membership for science assessors is currently not available on the HRC’s website. This contrasts with the information available online on the 10 Marsden panels run by the Royal Society of New Zealand. There is room for the HRC to improve the transparency of the science assessing committees by making available online the selection process and membership of the committees.

In addition, several stakeholders mentioned that the primary reviewer has undue influence on how an application is scored. One suggestion made by a couple of stakeholders was that comprehensive training be provided to panel members so that they share a common understanding about the process and what is required of them. Assessment panels should

³⁷ Specified in the HRC peer review manuals.

include those with knowledge of New Zealand's priority populations such as Pacific, Māori and people with disabilities.³⁸

Methodologies supported by assessment criteria

Many researchers who participated in focus groups felt that novel methodologies were not sufficiently supported by assessing committees. For example, the assessing committees were perceived to demonstrate a bias towards conservative research approaches and quantitative methodologies such as randomised controlled trials (RCTs). This can disadvantage applicants in public health, health systems, disability, some areas of clinical research, medical devices and rehabilitation technologies, where methodologies may appear to be less robust.

The conservative approach of science assessment panels is a common feature internationally and needs to be watched to ensure that qualitative and more novel methodologies are appropriately considered and funded. These methodologies may include the use of big data, administrative data and quality improvement methods. The HRC should ensure its assessment processes do not disadvantage novel ideas and innovative methodologies.

Conflict of interest processes

The feedback received from stakeholders was that the HRC generally deals well with conflicts of interest in its assessing committees and requires strict adherence to the policy. The HRC has an explicit disclosure of interest policy, which is applicable to all science assessing committee members and referees. For the first time the latest audit³⁹ identified one instance of a conflict of interest, where a named investigator on a grant application was also a member of the science assessing committee that was considering the application. In response to a recommendation from the audit report to strengthen its conflict of interest policy, the HRC has revised its policy, published in the *HRC Peer Review Manual*, for the next annual contestable round beginning on 15 June 2015.

Conflict of interest is always a difficult area to manage in a country like New Zealand, where the population is small. The pool of experts to draw in any skilled profession or specialist industry tends to be very limited. This can cause difficulty when trying to establish credible decision-making bodies for funding allocation: it is often the case that perceived conflicts of interest and actual conflicts of interest will arise for those appointed to the decision-making body. The conflict of interest process employed by the HRC should mitigate the risk of conflicts of interest affecting decisions made. This process should apply to all committees appointed or run by the HRC. The HRC should consider how to further internationalise the membership of its science assessment panels beyond Australasia in order to minimise the risk of conflicts of interest arising.

HRC investment tools

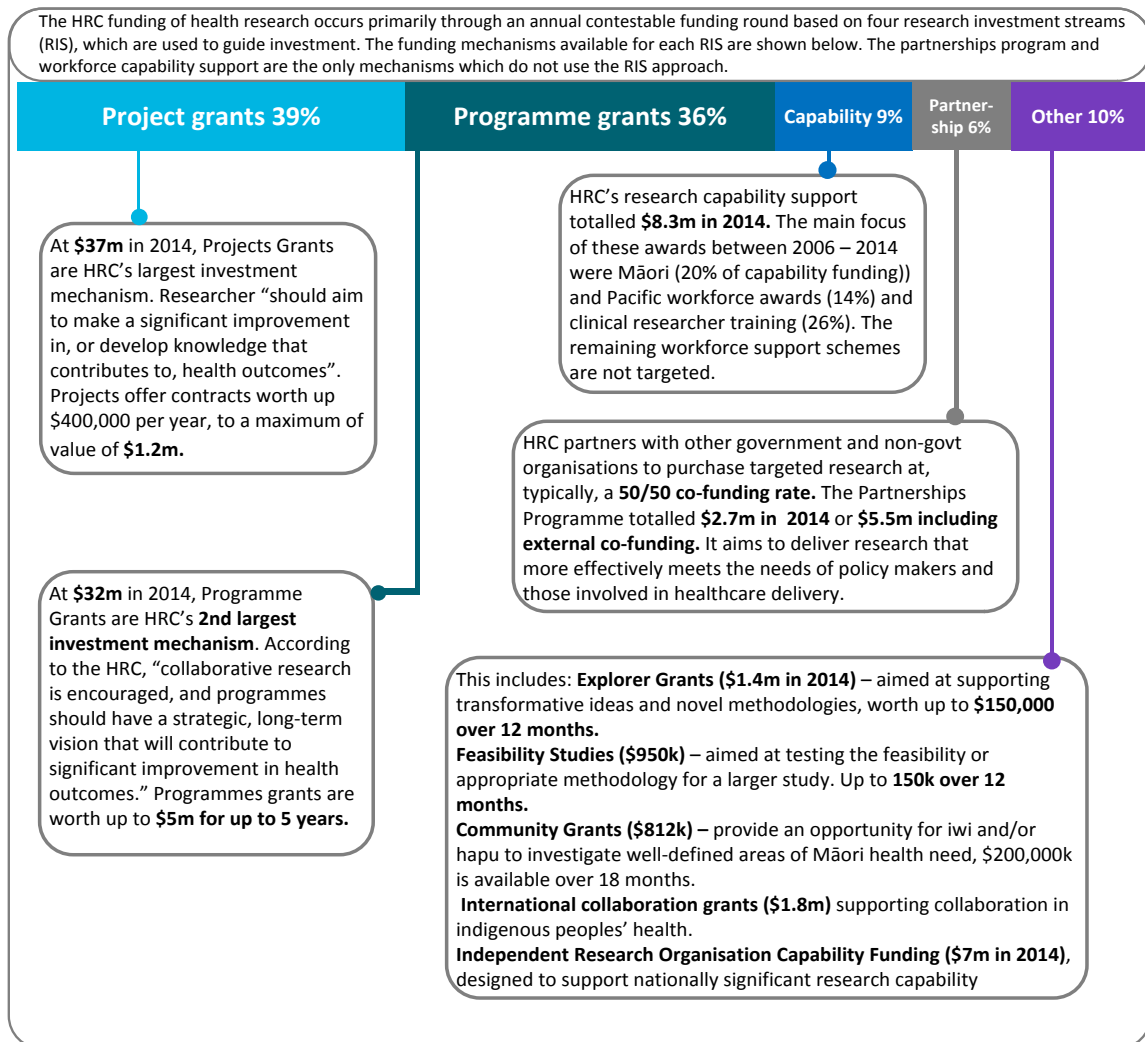
The HRC allocates the majority of its funding (89%) through projects and programmes (see Figure 5), aiming for an equivalent split of funding between each mechanism. The HRC has not reported the benefits and impacts of each funding mechanism and it is not clear what the rationale is for the 50:50 split. The programme mechanism potentially favours existing areas of strength due to the scale required of a programme. The project mechanism is important for ensuring that a wide range of health research is funded, and that emerging areas of strength receive funding. On the other hand, projects may be less effective at building up depth of

³⁸ This could apply to science assessing committees and the proposed dedicated impact assessment panel.

³⁹ Audit conducted by the Office of the Auditor-General for the year ended 30 June 2004.

expertise in a particular area. In developing its investment plan, the HRC should review its mix of funding mechanisms to ensure impact is maximised.

Figure 5 HRC’s investment mechanisms, size and purpose (outgoing funding), 2014



Source: HRC material.

In addition to funding projects and programmes, the HRC offers a range of scholarships and fellowships (mostly for Māori and Pacific researchers), and funding for feasibility studies (see Figure 5). In 2012 the HRC established the Explorer Grants, which provide seed funding for novel methodologies and transformative ideas. These grants are important for ensuring new ideas enter the pipeline, but many researchers were not aware of the Explorer Grants or did not continued to apply after the first year, when the success rate was very low (2%). The HRC should ensure potential candidates are aware of the Explorer Grants. In future, the HRC should also review the balance of its mechanisms overall, with a view to increasing those that are likely to have the most impact for New Zealand, or that fund the most relevant science.

The Partnership Programme is an effective mechanism for funding research of relevance to New Zealand. It enables the HRC to establish funding partnerships with organisations such as the Ministry of Health, DHBs and not-for-profit organisations around specific priority areas. There is evidence of a growing demand for this fund, but it is relatively small which could easily lead to interest outstripping the availability of funding. The current on-demand scheme carries

relatively high transaction costs for the HRC secretariat. If interest in the Partnership Programme continues to grow, it will be important to have some kind of prioritisation approach to ensure the funding goes to the most appropriate applications.

There is potential for improvements in the operations of the Partnership Programme to ensure research funded is of relevance to New Zealand and to manage demand. This may include setting priorities for the fund or making an annual call for proposals. The HRC also needs to ensure an appropriate balance is struck between research quality and meeting stakeholder needs. Several partners noted that the processes were too inflexible which could lead to research being funded that did not fully meet their needs. The HRC could take a more strategic approach to identify opportunities to extend co-investment with DHBs and other health providers.

Balance of portfolios

The HRC maintains a relatively stable portfolio of biomedical, public health, clinical research and health services (see Figure A1 and Figure A2). Over time the amount of biomedical research funded by the HRC has been relatively constant, at around 40% of total funding. Public health has been declining since 2009, falling from 43% to 34%. Clinical research has increased its share, rising to 18% in 2014. Research targeted specifically at health services delivery remains relatively small at around 6%.

The programme mechanism appears to favour biomedical research: 73% of programme funding is awarded through the biomedical committee. Success rates in the biomedical research committee are 37%, compared with public health 13% and Māori health 20% (2011–2014 average, see Table A1). Some researchers expressed concern at the high rate of programme funding granted to biomedical researchers. It is not clear that the quality of biomedical programmes is that much higher than the other areas to warrant such a high rate of funding for biomedical science programmes. Success rates for project applications between research assessed by the biomedical committees and the other committees do not differ to the same degree: both the public health and biomedical committees funded 12% of proposals in the period 2011–2014.⁴⁰

There may also be missed opportunities to fund multi-disciplinary research programmes and projects that transcend health research areas, and even extend into other research areas such as engineering or the social sciences. Membership of most of the science assessing committees are fairly narrowly focused on particular areas of biomedical or public health research. This has particular advantages for ensuring a good match between the panel members' area of expertise and the application being assessed. However, a narrowly focused membership may reinforce divides between disciplines, which can hinder multi-disciplinary research, and it may also increase the risk of conflicts of interest. The HRC may wish to consider how best it can foster multi-disciplinary research in the future through its organisation of science assessing committees and assessment criteria. How best to foster multi-disciplinary research is also a matter for consideration in the health research strategy.

The strategic refresh has not drawn conclusions on the HRC's balance of portfolios and mix of investment mechanisms. The HRC is best placed to make such decisions as part of its three yearly investment plan, once the health research strategy is completed.

Recommendation 13 Agree that it would be appropriate for the HRC to consider its operations and processes in light of the findings of the strategic refresh.

⁴⁰ Refers to the percentage of Expression of Interest applications funded.

Recommendation 14 Agree that it would be appropriate for the HRC to further internationalise the membership of its science assessment panels beyond Australasia in order to minimise the risk of conflicts of interest arising.

7. Funding level of the HRC

The HRC is primarily funded out of the Health and Society Research appropriation from Vote Business, Science and Innovation.⁴¹ In Budget 2015 the HRC will receive \$77.175 million, along with \$3.195 million in operational funding. It also receives annually a small amount of funding from Vote Health for its ethics role. In 2014/15 this was \$285,000.

Officials note that the level of HRC funding has remained relatively static in nominal terms since 2009/10. In recognising the critical role health research plays in both the health sector and the science and innovation system, and in the context of Government's commitment to raise science funding to 0.8% of GDP, it is suggested that health research be a priority for funding increases.

Funding level of HRC

For some time health researchers have argued for HRC funding to increase. During focus groups and individual discussions for the refresh almost all stakeholders raised concerns about the inadequacy of funding for the HRC. Many health researchers felt that the low level of funding threatened New Zealand's capability in health research, particularly biomedical research and support for basic research in the health sciences. Comment was made, for example, that seemingly arbitrary decisions are made by the science assessing committees as to what is deemed 'fundable' and what is not. The low level of funding effectively forces the committees to discriminate between outstanding and excellent science. Stakeholders who had experience as HRC panel members noted that it was relatively straightforward to identify poor, average and good quality science, but that it was difficult to differentiate between outstanding and excellent science. In addition, the external advisors and some stakeholders were also of the view that low levels of funding encouraged the HRC's assessment panels to become more conservative in their decisions.

When expressing their view that an increase in funding is needed, the HRC and others have pointed to a number of factors:

- the level of HRC funding as a percentage of GDP and government appropriations on R&D
- comparisons of funding levels with other countries
- HRC funding decreasing in real terms
- the high number of quality science proposals not receiving funding
- the large size of the health sector and the consequent need to undertake research that could improve health service delivery.

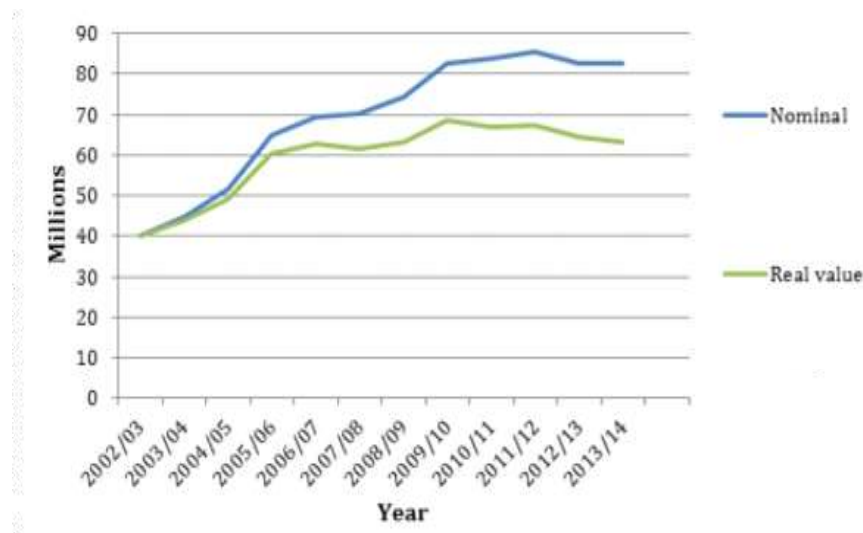
Between 1991 and 2014 HRC's funding increased more than four-fold in real terms.⁴² In the years leading up to 2008, government funding to the HRC progressively increased. Part of the increase reflects a change to full-cost funding, which began to be implemented in 1998.⁴³ Since 2009/10 the level of HRC funding has remained relatively static in nominal terms, but has fallen by 8% in real terms (see Figure 6). During this period research costs (especially salaries) have risen, and because overheads are charged as a percentage of salary costs, the direct support for health research has fallen even further.

⁴¹ Prior to 1997 funding was provided through Vote Health. The appropriation was transferred to the science appropriation in 1997 in order to reflect the role that health research plays as part of the wider science and innovation sector. The transfer also allowed the HRC to move to a full-cost funding model in accordance with the rest of the science sector.

⁴² When the HRC was established in 1991 it received \$11.857 million.

⁴³ Overheads charged to project and programme grants increased from 0% in 1997/98 to 103% of salary costs in 2003/04.

Figure 6 HRC government funding in nominal and real terms, 2002/03–2013/14



Source: HRC annual reports

Notes: Figures include the total government grants received by the HRC. Total revenue (not shown) includes funding sources other than government.

Funding increases enabled the HRC to build up its equity, which has remained fairly high since 2002. This equity is made up from accumulated funds and other reserves. Over the last few years the HRC has used some of these reserves to fund research,⁴⁴ and in 2011/12 it informed the Health Select Committee that it intended to manage its expenditure over the next three years by varying the number and size of research contracts to progressively reduce equity to approximately \$5 million.⁴⁵ While HRC equity does not seem to have dropped steadily over this period, in the most recent allocation rounds the HRC applied a significant proportion of reserves to fund a number of additional projects. The associated drop in equity will show in the organisation's 2015/16 annual financial statements. The HRC has advised it is implementing a plan to manage down its reserves.

Between 40% and 45% of the HRC's contestable funding goes towards overheads charged by contracting organisations.⁴⁶ Overheads are applied to all science funding due to the full-cost funding model applied throughout New Zealand's science system. The full-cost funding model is in principle sound, as it covers all the costs associated with the research, including a proportion for salaries and maintaining facilities. It also removes incentives for institutions to cross-subsidise between different areas of research. MBIE is considering how the level of overheads can be made more transparent.

Building a case to increase funding

While there is clearly a strong call from the health research community for an increase in the level of HRC funding, the case for funding increases needs to be considered in terms of value for New Zealand, particularly in a tight fiscal environment. There is a strong rationale for government intervention and investment in health research: the outcomes being sought from health research are expected to contribute directly to wellbeing and improved health outcomes.

⁴⁴ For example, in 2011/12 the HRC's income totalled \$85.513 million and expenditure totalled \$91.152 million, resulting in a deficit of \$5.639 million. The deficit was funded from reserves, resulting in a reduction in equity from \$15.15 million at the beginning of the financial year to \$9.505 million at 30 June 2012.

⁴⁵ Report of the Health Committee (2013).

⁴⁶ The rate varies by organisation. Universities typically charge around 110–115% of salary costs.

The quality of the research funded by the HRC is high, and has been an important contributor to the growing diagnostics and medical devices sector.

There is strong international evidence to show that health research has made impressive contributions to health and economic outcomes. There is also evidence to show that the HRC funds health research that is of high quality scientifically. However, the HRC's investment impact reporting has not traditionally been strong. While it has, in some instances, been able to show a link between research it has funded and better outcomes, in general the HRC's impact reporting has focused on what it has funded and how, rather than how the results of that research have improved outcomes.

The current investment impact report is a big step in the right direction because it contains some excellent examples of where health research has led to direct benefits for New Zealanders (see box on page 5). However, it is important that the HRC continue to improve its investment impact report, with a focus on demonstrating the impact of the research it has funded. Provision of the investment impact report should, in future, be three-yearly to inform funding negotiations.

Formal review process for HRC funding

Under the HRC Act, the HRC is mandated to renegotiate its funding every three years. Over time, as the structure of monitoring agencies has changed, the processes used to set the level of HRC funding have been lost. No formal process currently exists. It is proposed that the triennial process for negotiating and setting the level of HRC funding be established immediately. This process should draw on the HRC's investment impact report.

Given the fall in HRC funding in real terms over the last five years, a consideration of the level of HRC funding should occur once the health research strategy has been articulated. To this end, the first of these three-yearly processes should be completed in time for any agreed increases to be reflected in Budget 2017.

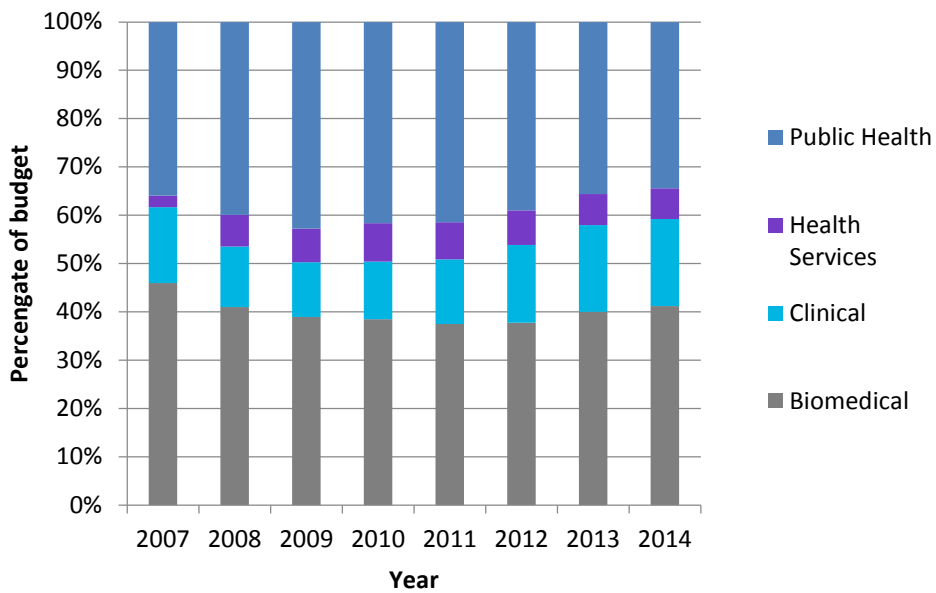
Operational costs

Under the output agreement between the HRC and the Minister of Science and Innovation, the HRC is required to keep its costs of operations, which include the selection, negotiation and management of its health research contracts, to no more than 5% of total Crown fund payments. Since 2005 the HRC's Research Contract Management (RCM) funds have been limited to \$3.195 million. Since 2011, this has equated to 4.04% of the total Crown funds the HRC manages. Since 2005 the HRC's RCM funds have fallen short by an average of \$1.088 million per year. The HRC has undertaken additional work and used the management fees earned from activities such as research partnerships. Despite the decline in operational funding in real terms, the HRC has continued to fund high-quality science with tight processes. Like all government-funded organisations, the HRC should continually identify opportunities for cost savings and efficiencies.

Chapter 4 recommended that the HRC enhance some of its roles. These suggested changes might require the HRC to increase its capacity and bring in some new capabilities. The shifts in role that are being recommended would be of great value to the wider health research and innovation sectors. It is recommended that additional costs associated with these recast functions be met through a commensurate increase in operational funding from the 2016/17 year. The actual cost should be reviewed after one year to ensure increased costs associated with the shift in roles are being met. The Ministry of Health and MBIE should explore options for meeting costs to the HRC associated with development of the health research strategy.

- Recommendation 15** **Agree** that health research be a priority for funding increases in the context of government's commitment to raise science funding to 0.8% of GDP.
- Recommendation 16** **Direct** MBIE and the Ministry of Health to develop, as soon as possible, a formal triennial process to set the level of HRC funding, drawing on the HRC's investment impact report.
- Recommendation 17** **Agree** that the first round of the triennial funding process take place following the development of the health research strategy, but in time for any agreed funding increases to be reflected in Budget 2017.
- Recommendation 18** **Agree** to increase operational funding from the 2016/17 year, to allow for the shift in focus and roles of the HRC, and to review this level in one year.

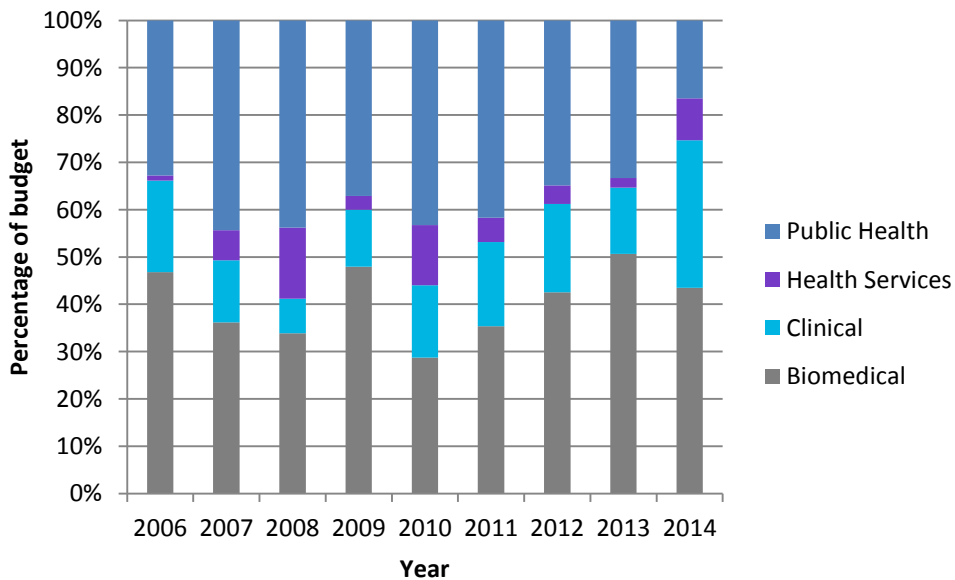
Figure A1 HRC contestable funding,⁴⁷ by research type (outgoing funding), 2007–2014



Source: HRC contract data 2006–2014.

Notes: Data for 2006 has been excluded due to the low number of contracts in the data set compared to the other funding years.

Figure A2 HRC contestable funding, by research type (contracts awarded), 2006–2014

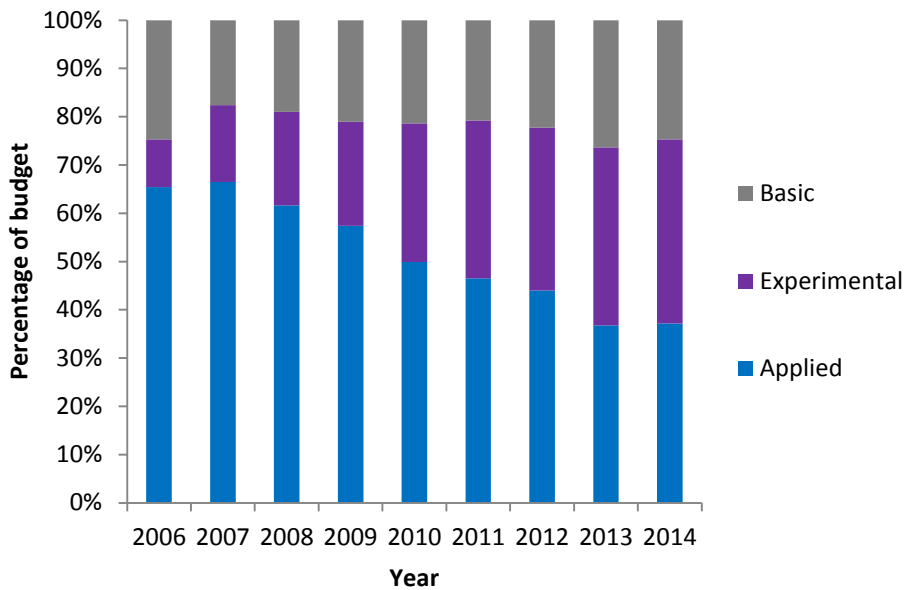


⁴⁷ Includes projects, programmes, partnerships, community grants, international collaboration support, feasibility studies and Explorer grants. This excludes emerging researcher grants and career development awards. A total of 668 research contracts were analysed.

Source: HRC contract data 2006–2014.

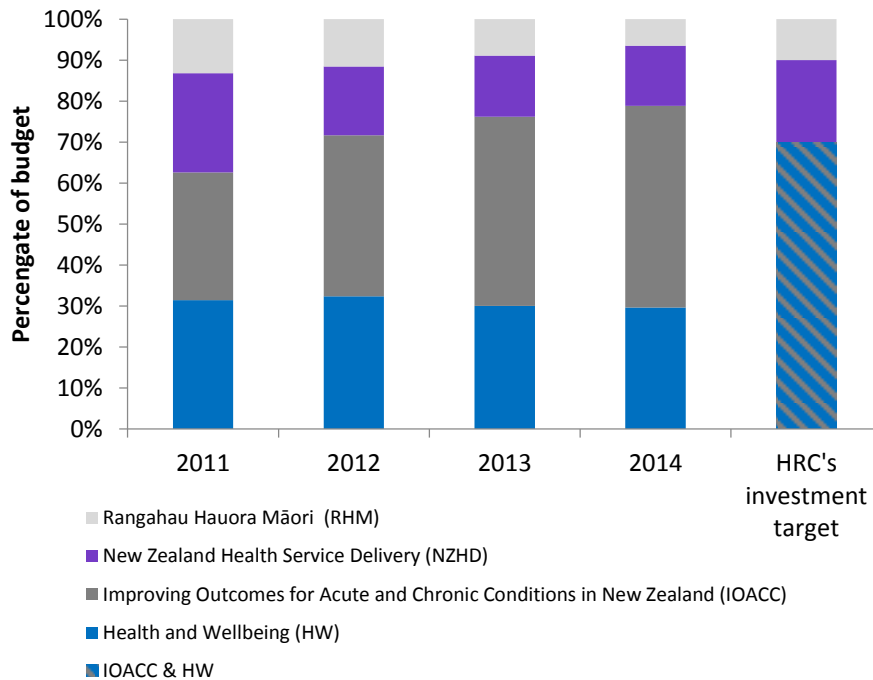
Notes: There is a greater amount of yearly variability in this figure because the data is based on contracts awarded rather than outgoing funding.

Figure A3 HRC contestable funding, by Frascati classification (outgoing funding), 2006–2014



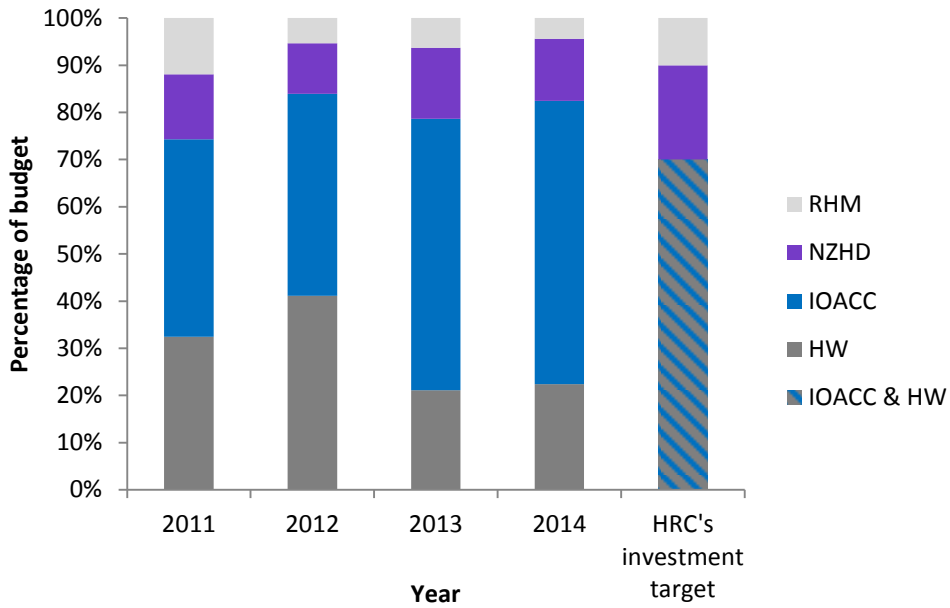
Source: HRC contract data 2006–2014.

Figure A4 HRC contestable funding, by investment stream (outgoing funding), 2011–2014



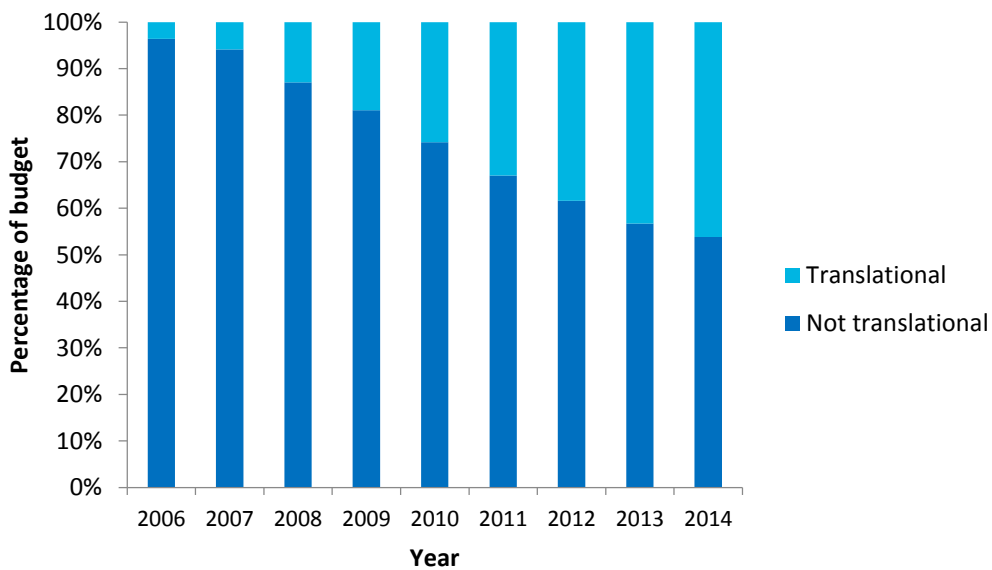
Source: HRC contract data 2006–2014. The HW and IOACC investment streams have a combined approximate investment target at 70%.

Figure A5 HRC contestable funding, by investment stream (contracts awarded), 2011–2014



Source: HRC contract data 2006–2014.

Figure A6 HRC contestable funding aimed at translation (outgoing funding), 2006–2014



Source: HRC contract data 2006–2014.

Notes: 5% of contracts were not coded for this category. HRC’s research evaluation criteria stipulate that research is translation if:

- (i) **EITHER**, it meets all of the following criteria:
 - a. is a clinical trial or an intervention or observational research aimed at informing policy
 - b. research application demonstrates sustained engagement with end-users
 - c. the research proposal has the intent of application or uptake
 - d. is likely to be translated in the short-to-medium term
- (ii) **OR**, the research must represent a progression from one of the following pipeline categories to another:
 - a. discovery of potential prevention/treatment strategy
 - b. non-clinical testing, eg, in animal models
 - c. clinical trial or study to determine efficacy

- d. integration of treatment/prevention strategy into routine practice.

HRC does not collect data on the amount of research that falls into each category of translational research. We are therefore unable to provide figures on the growth rates for each category.

Figure A7 HRC contestable funding relevant to Māori (outgoing funding), 2007–2014

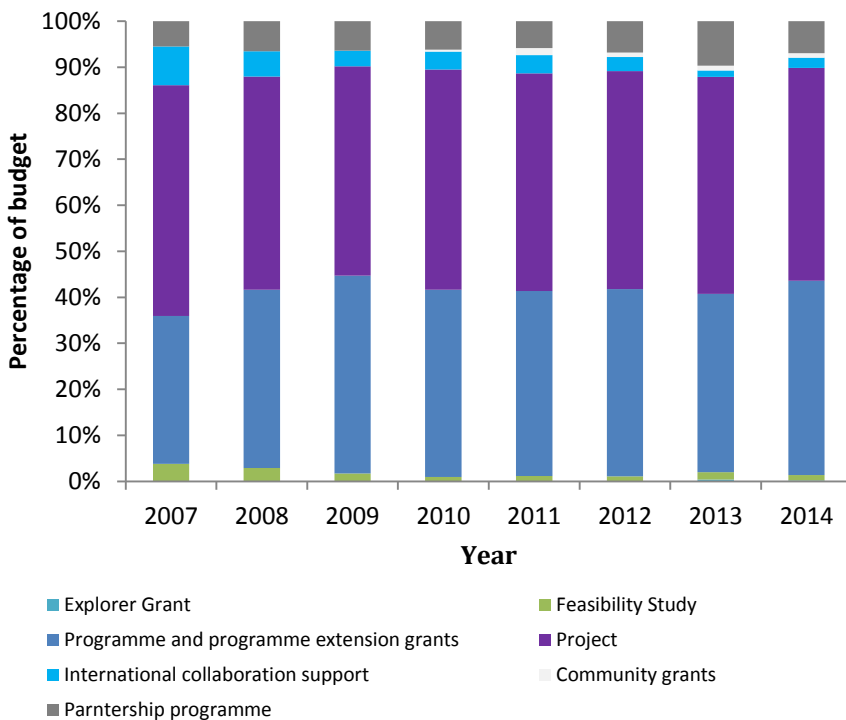


Source: HRC contract data 2006–2014.

Notes: 5% of contracts were not coded for Māori advancement or development.

- (i) To be classified as Māori development, research must:
 - a. be Māori controlled (ie, is Māori-led and involves Māori co-investigators) AND
 - b. involve a significant number of Māori as participants or the analysis of data sets that include a significant Māori cohort AND/OR
 - c. involve the development and/or use of kaupapa Māori methodologies AND/OR
 - d. provide training or a named Māori researcher.
- (ii) To be classified as Māori advancement:
 - a. the research will involve a significant number of Māori as participants or the analysis of data sets that include an 'adequate' Māori cohort AND
 - b. the research will involve Māori researchers as part of the study team AND/OR
 - c. the research provides a training opportunity for a named Māori researcher.

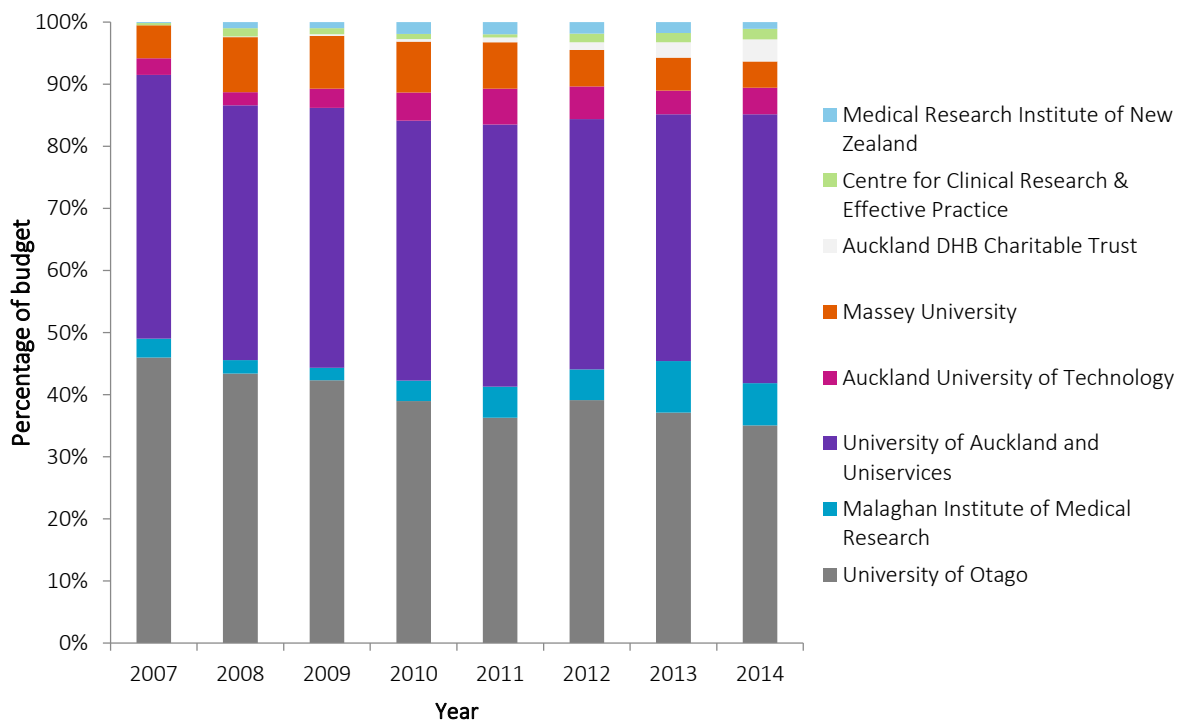
Figure A8 HRC funding, by proposal type (outgoing funding), 2007 – 2014



Source: HRC contract data 2006–2014.

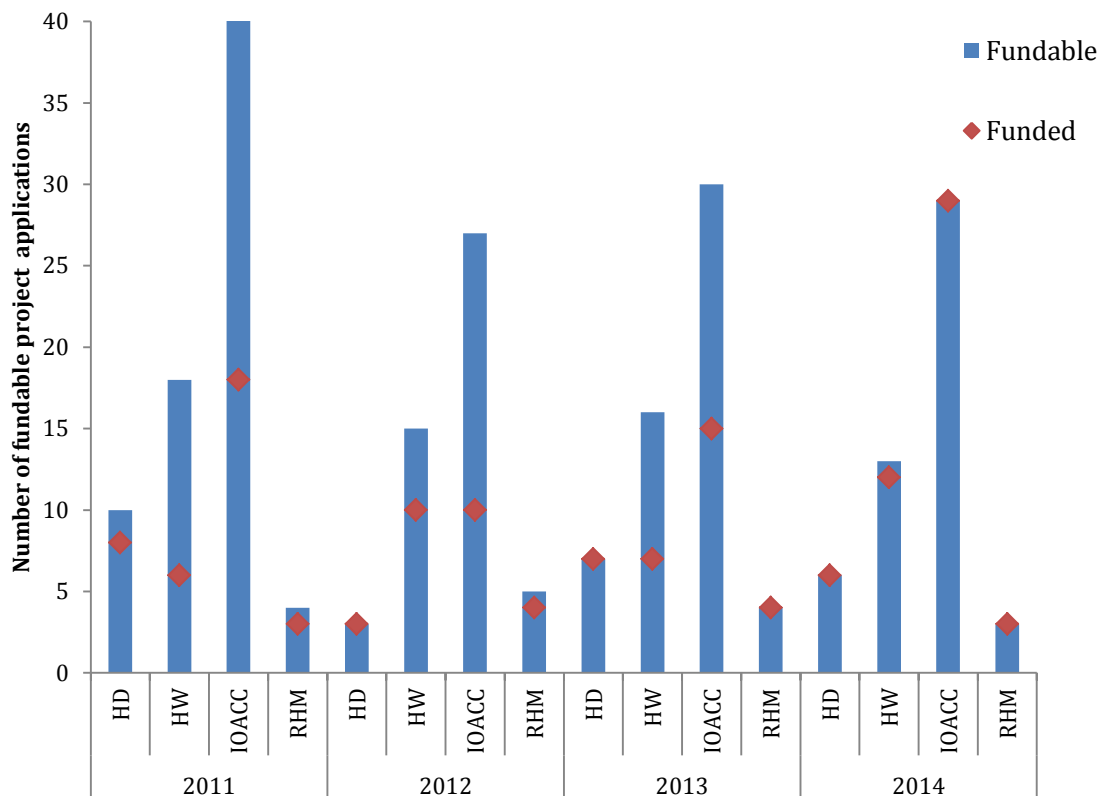
Notes: ‘International collaboration grants’ represents the combined value of the International Investments Opportunity Fund grants and the International Collaborative Indigenous Health Research Partnership grants.

Figure A9 HRC recipients of contestable funding (outgoing funding), 2007–2014



Source: HRC contract data 2006–2014

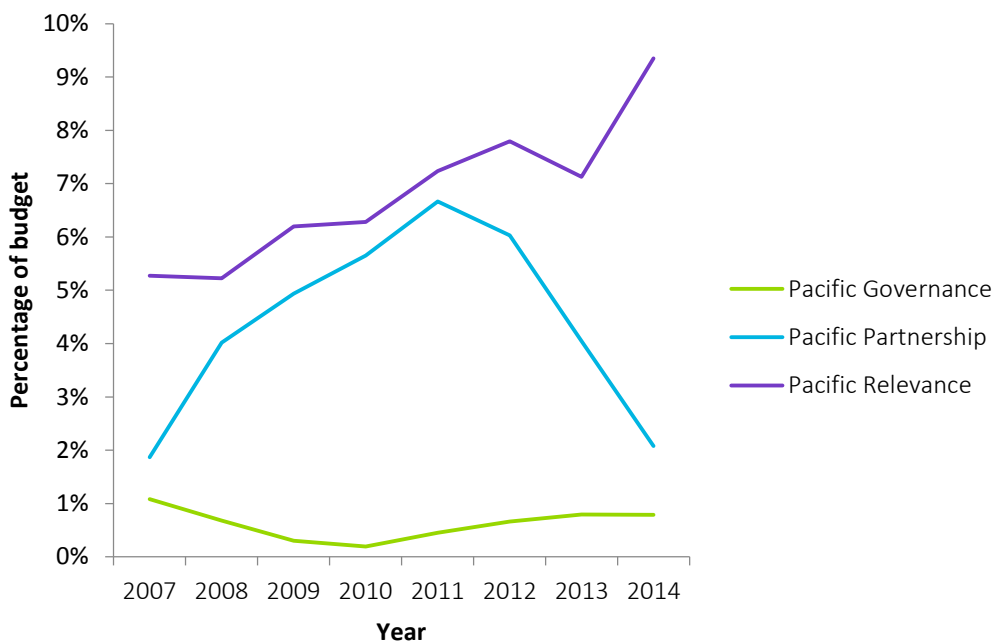
Figure A10 'Fundable' and 'funded' projects, by research investment stream, 2011–2014



Source: HRC’s proposal data.

Note: HRC’s science assessing committees determine whether a project application is deemed fundable or not.

Figure A11 HRC contestable funding relevant to Pacific (outgoing funding), 2007–2014



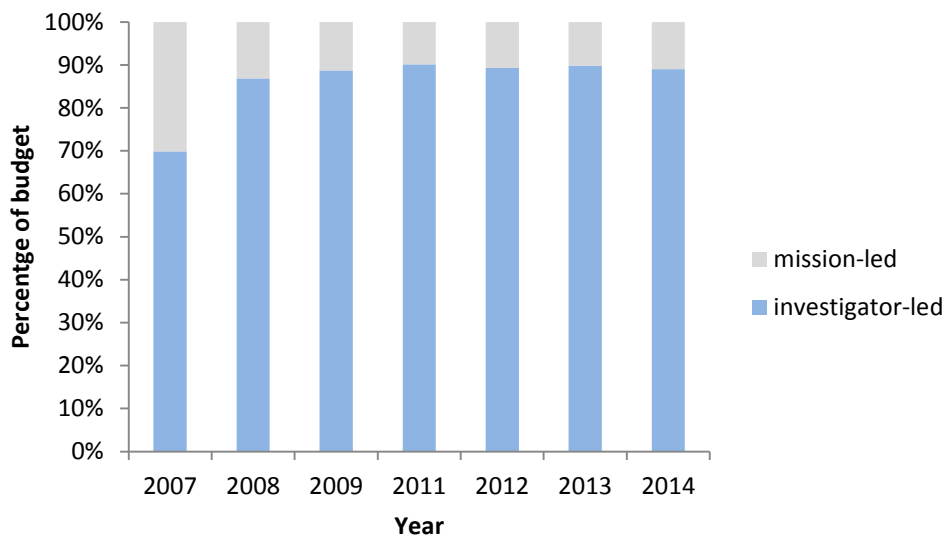
Source: HRC contract data 2006–2014.

Notes: 5% of contracts were not coded for these Pacific categories. For a detailed description of each category, please request this information from the HRC. In summary, HRC’s research evaluation criteria stipulate:

- (i) To be classified as ‘Pacific relevance’, research must satisfy the following criteria:

- a. all research which involves a general population sample should include Pacific participants, there has been consultation with Pacific representatives, and the dissemination approach is designed to reach the Pacific community.
- (ii) To be classified as 'Pacific partnership', research must have one of the following:
 - a. be of significance to the Pacific community and have an ongoing and established consultation mechanism with the Pacific community
 - b. include an identifiable Pacific cohort and provide research training opportunity to Pacific researchers
 - c. utilises Pacific approaches to research and have plans for the dissemination of the research results to the Pacific community.
- (iii) To be classified as 'Pacific governance', the research must meet all minimum expectations of Pacific relevance and *at least three* Pacific partnership criteria, as well as: the proposal is 'by Pacific for Pacific' or can be categorised as Pacific-led research (if the first-named investigator is not Pacific, the research team must demonstrate how it remains a Pacific-led project).

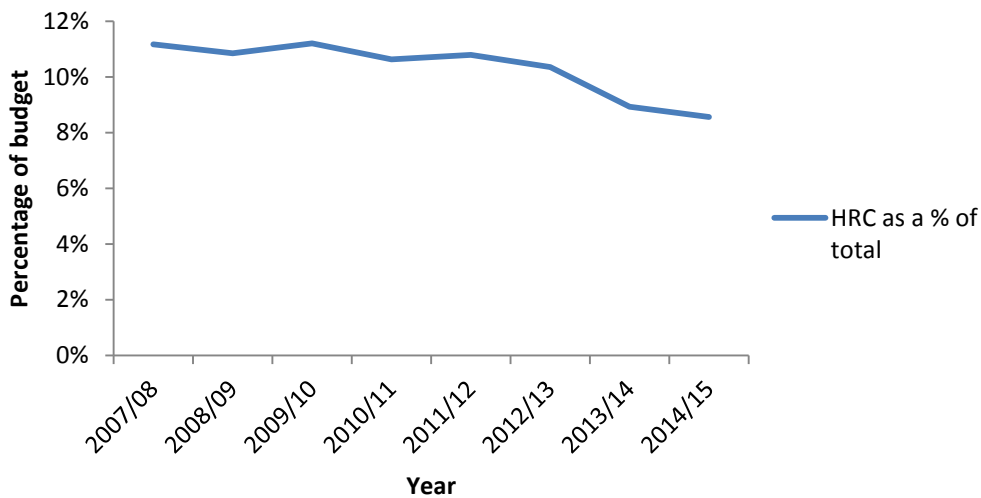
Figure A12 HRC contestable funding, by type of mechanism (outgoing funding), 2007–2014



Source: HRC research contract data.

Note: The categories used are those of the HRC and as applied by the HRC.

Figure A13 HRC funding as percentage of Vote Science and Innovation, 2007/08–2014/15



Source: New Zealand Treasury Appropriations

Table A1 Programme grant success rate, by type of research, 2011–2014

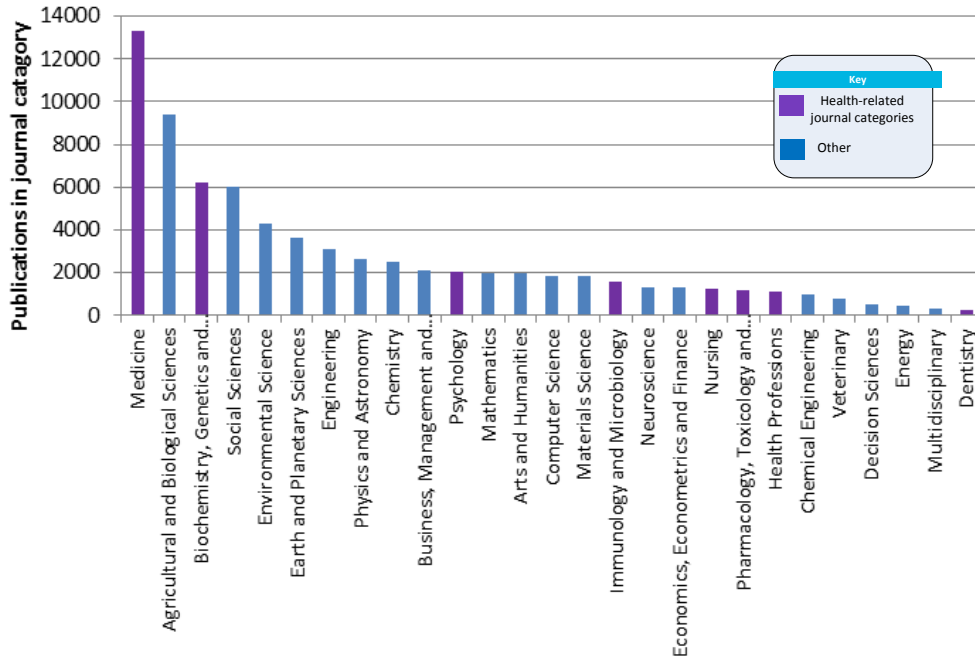
Research type	Total applications	Funded	% funded	% of total funded
Public health	23	3	13%	20%
Biomedical	30	11	37%	73%
Māori health	5	1	20%	7%

Source: HRC programme grant success rate data supplied by the HRC secretariat.

Notes: The Health Service Delivery investment stream does not allow programme grant allocations.

Appendix 2 Bibliometric analysis of health research in New Zealand

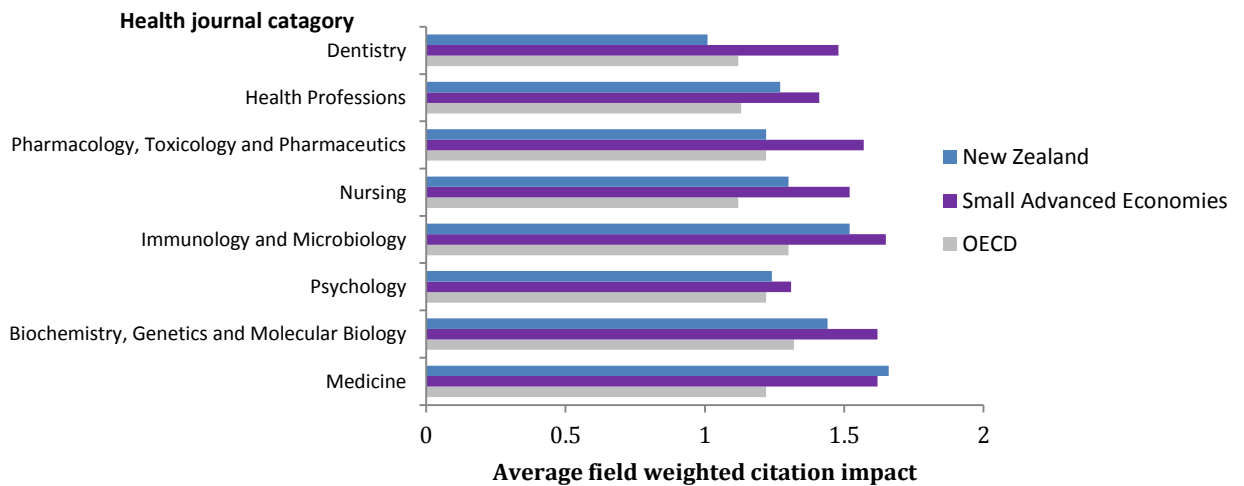
Figure A14 New Zealand publication outputs (articles only), 2010–2014



Source: Scopus database.

Notes: The journal categories classified as health were selected to provide an approximate indication of the volume of New Zealand’s health research publication outputs. Non-health related research may also be published in the health research journal categories, such as the Psychology category. Likewise, health-related research may be published in journal categories not specifically highlighted, such as Neuroscience.

Figure A15 Field weighted citation impact by health journal category (articles only), 2010–2014



Source: Scopus database.

Table A2 New Zealand's health sub-categories (all publications), 2010–2014

Journal category	Journal sub-category	NZ FWCI	Outputs	% of outputs	SAE FWCI
Medicine		1.6	18975	52%	1.84
<i>Top 5 sub-categories</i>	Gastroenterology	2.36	287	< 1%	1.79
	Hepatology	2.29	137	< 1%	1.56
	General Medicine	2.05	5961	16.6%	1.84
	Rheumatology	2.05	250	< 1%	1.87
	Nephrology	1.88	181	< 1%	1.37
<i>Bottom 5 sub-categories</i>	Physiology (medical)	1.11	504	1.4%	1.38
	Radiology, Nuclear Medicine and Imaging	1.02	398	1.1%	1.36
	Complementary and Alternative Medicine	0.85	112	< 1%	1.13
	Dermatology	0.81	167	< 1%	1.52
	Health Informatics	0.78	288	< 1%	0.98
Biochemistry, Genetics and Molecular Biology		1.52	7447	20.7%	1.52
<i>Top 3 sub-categories</i>	Genetics	1.98	1599	4.5%	1.98
	General Biochemistry, Genetics and Molecular Biology	1.73	1478	4.1%	1.89
	Biochemistry	1.23	1429	4%	1.44
<i>Bottom 3 sub-categories</i>	Clinical Biochemistry	1.04	416	1.2%	1.24
	Biophysics	0.96	466	1.2%	1.25
	Structural Biology	0.94	170	<1%	1.11
Psychology		1.26	2599	7.2%	1.31
<i>Top 3 sub-categories</i>	Social Psychology	1.6			1.36
	Clinical Psychology	1.42	424	1.2%	1.34
	Developmental and Educational Psychology	1.26	667	1.9%	1.35
<i>Bottom 3 sub-categories</i>	General Psychology	1.15	616	1.7%	1.31
	Applied Psychology	1.12	404	1.1%	1.22
	Psychology (miscellaneous)	0.98	71	< 1%	1.27
Immunology and Microbiology		1.58	1898	5.3%	1.65
<i>Top 3 sub-categories</i>	General Immunology and Microbiology	1.97	395	1.1%	1.94
	Immunology	1.62	523	1.5%	1.71
	Microbiology	1.59	526	1.5%	1.55
<i>Bottom 3 sub-categories</i>	Virology	1.51	200	<1%	1.47
	Parasitology	1.36	247	<1%	1.62
	Applied Microbiology and Biotechnology	1.26	395	1.1%	1.64
Nursing		1.32	1621	4.5%	1.52
<i>Top 3 sub-categories</i>	Fundamentals and Skills	6.08	12	< 1%	1.86
	Emergency Nursing	2.25	35	< 1%	2.18
	LPN and LVN	1.67	39	< 1%	1.28
<i>Bottom 3 sub-categories</i>	Pediatrics	0.69	25	< 1%	0.92
	Maternity and Midwifery	0.61	38	< 1%	1.01
	Pharmacology (nursing)	0.18	3	< 1%	1.07
Pharmacology, Toxicology and Pharmaceutics		1.36	1520	4.2%	1.57
<i>Top 3 sub-categories</i>	Pharmacology, Toxicology and Pharmaceutics (miscellaneous)	1.99	8	< 1%	1.57
	Pharmaceutical Science	1.52	414	1.2%	1.71
	Drug Discovery	1.38	361	1%	1.22
<i>Bottom 3 sub-categories</i>	Pharmacology	1.3	779	2.2%	1.63
	General Pharmacology, Toxicology and Pharmaceutics	1.24	69	< 1%	1.58

	Toxicology	1.22	257	< 1%	1.4
Health Professions		1.36	1433	4%	1.41
<i>Top 3 sub-categories</i>	Pharmacy	1.72	55	< 1%	1.87
	Health Information Management	1.51	39	< 1%	1.18
	Radiological and Ultrasound Technology	1.5	79	< 1%	1.45
<i>Bottom 3 sub-categories</i>	Health Professions (miscellaneous)	0.73	51	< 1%	0.77
	Medical Laboratory Technology	0.69	23	< 1%	1.22
	Respiratory Care	0	4	< 1%	1.73
Dentistry		0.97	399	1.1%	1.48
All sub-categories	Dentistry (miscellaneous)	1.39	8	< 1%	1.04
	Periodontics	1.11	24	< 1%	1.14
	Oral Surgery	0.97	80	< 1%	1.32
	General Dentistry	0.96	286	< 1%	1.63
	Orthodontics	0.72	21	< 1%	1.08

Source: Scopus database.

Notes:

1. Outputs refers to all academic outputs including articles, conference papers, reviews, editorials and short surveys.
2. Percentage of outputs refers to the percentage of total health-related publication outputs from 2010 to 2014.
3. Ten sub-categories are shown for Medicine as it is the largest health category with 48 sub-categories.
4. SAE refers to Small Advanced Economies group (Denmark, Finland, Ireland, Israel, New Zealand and Singapore).

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Appendix 4 Focus groups and meetings held

Table A3 Focus groups

Location	Attendees
Auckland	Health researchers: University of Auckland
Auckland	Health researchers: Auckland University of Technology
Auckland	Māori researchers: University of Auckland, Massey University, Auckland University of Technology
Auckland	Pacific researchers: University of Auckland, Massey University, Auckland University of Technology
Auckland	Auckland DHBs: Auckland, Counties Manukau, Waitemata
Auckland	Not-for-profit organisations
Auckland	Firms – medical devices and health IT
Auckland	Firms – biotech/pharma, NZ Bio
Hamilton	Health researchers: University of Waikato
Hamilton	Waikato DHB, Waikato Clinical School
Palmerston North	Health researchers: Massey University
Palmerston North	Massey-hosted CoREs
Palmerston North	MidCentral DHB
Wellington	Health researchers: Victoria University of Wellington, Massey University, University of Otago
Wellington	Māori and Pacific researchers: Victoria University of Wellington, Massey University, University of Otago
Wellington	Not-for-profit organisations
Wellington	Independent institutes and researchers
Christchurch	Health researchers: University of Otago, University of Canterbury, Lincoln University
Christchurch	Canterbury DHB
Christchurch	Medical technology firms
Dunedin	Research directors: University of Otago
Dunedin	Health researchers: University of Otago
Dunedin	Medical technology firms and Otago Innovation Limited

A total of 171 individuals attended the focus groups.

Table A4 Semi-structured interviews

ACC
Auckland UniServices Ltd
Callaghan Innovation
Council of Medical Colleges of New Zealand
National Health Committee
NZ Medical Association
NZ Nursing Organisation
Royal Society of NZ
Superu
Tertiary Education Commission
Women's Health Action

Separate discussions were held with members of each university's executive team, and a teleconference was held with Universities New Zealand Research Committee.

A number of additional meetings were held with individuals, including the Professor Sir Peter Gluckman, Sir David Skegg, Professor Jackie Cumming, Professor Chris Cunningham, Professor Peter Hunter, Professor Richie Poulton, Dr Helen Lunt and Dr Margaret Wilsher.

Officials held ongoing discussions with the HRC secretariat throughout the refresh process to discuss:

- governance of the HRC
- priorities of the HRC
- priority setting processes of the HRC
- investment mechanisms of the HRC
- assessment processes of the HRC
- contract data and other data holdings of the HRC
- operational funding of the HRC.

Two external advisors were employed to assist the strategic refresh. Their roles were to:

- i. facilitate focus group discussions
- ii. provide expert advice to the project team and steering group on issues relevant to the strategic refresh
- iii. provide comment to the steering group on the draft report's findings and recommendations.

Professor Emeritus Carl David Burgess was a Professor of Medicine and Clinical Pharmacology at the Wellington School of Medicine and Health Sciences from 1982 to 2013. He was awarded the Fellowship of the Royal Australasian College of Physicians (FRACP) in 1989 and was elected as a Fellow of the Royal College of Physicians (FRCP) in 2003. He taught both internal medicine and clinical pharmacology from 1976 to 2013 and has also been involved in clinical pharmacology research since 1976. He has investigated the use of such drugs as anti-depressives, antiarrhythmic agents and bronchodilators, and more recently have been involved in assessing the use of medicines in hospital. Professor Emeritus Carl Burgess was made a Member of the New Zealand Order of Merit (MNZM) for Services to Pharmacology in the 2013 Queen's Birthday Honours list.

John Watson Funder (Companion of the Order of Australia) is an Australian medical researcher. He was President of the Australian Society for Medical Research (1979) and of the Endocrine Society of Australia (1984), and was Chairman (1996–2000) of the International Society for Endocrinology. In 1990 he resigned as a Senior Research Fellow of the National Health and Medical Research Council to become Director of the Baker Medical Research Institute (1990–2001). He is a Senior Fellow at Prince Henry's Institute of Medical Research at Monash Medical Centre, and a Professorial Fellow at the Centre for Neuroscience at the University of Melbourne.

In 1998 John Funder was appointed an Officer of the Order of Australia for service to medicine, particularly in the field of endocrinology research, and in the development of public policy across a range of primary health issues. In 2015 Funder was appointed a Companion of the Order of Australia for eminent service to medicine, particularly to cardiovascular endocrinology, as a renowned researcher, author and educator; to the development of academic health science centres; and to mental illness, obesity, and indigenous eye-health programmes. John Funder was also awarded the Centenary Medal in 2001 for service to the commercialisation of health and medical research.

Background information

The Health Research Council, established in 1990, is the government's principal funding agency for health research. The HRC receives the majority of its funding through a bulk grant of \$77 million per year through Vote Science and Innovation.

Health research is an area of mutual interest to the Minister of Science and Innovation and the Minister of Health. The HRC is responsible to the Minister of Health, but negotiates annual funding agreements with the Minister of Science and Innovation.

The HRC is not the sole funder of health research in New Zealand. Other sources of funding now include the National Science Challenges, the Centres of Research Excellence funding mechanism and a small proportion of funding under non-sectoral funding mechanisms, such as the Marsden Fund. Additional public funding is available through Votes Tertiary Education, Health and Internal Affairs.

Purpose

The Minister of Science and Innovation and the Minister of Health have requested officials to provide advice on how to maximise the contribution of the HRC to broader health and economic goals.

Ministers wish to optimise the impact of the HRC and raise its profile and visibility. Ministers also wish to ensure that HRC funding and other relevant funding mechanisms are closely aligned.

Scope

The strategic refresh exercise will focus on optimising the relevance, efficiency, effectiveness and impact of the HRC. The project will address the following questions:

Relevance

1. Do the expected outcomes and activities of the HRC strike an appropriate balance between health and economic priorities, and what is the appropriate balance?
2. To what extent does the HRC fund research relevant to the Government's health priorities? To what extent does the HRC fund research relevant to the Government's science, innovation and economic development objectives? To what extent is HRC-funded research relevant to the retention and growth of New Zealand's research community, and to New Zealand's international reputation in health research?
3. To what extent do the policies and priorities of the HRC reflect the diverse demographic structure of New Zealand (eg, ageing population; growing Māori and Pacific populations)?

Efficiency

4. How does HRC-funded research complement or align to the other funding mechanisms that support health research programmes?
5. How does HRC-funded research complement or align to the research carried out independently by the district health boards and other publicly funded health sector agencies?
6. Can the HRC funding processes be improved? If so, how?

7. Is the current level of research contract management costs provided to the HRC adequate?

Effectiveness

8. Are the current governance arrangements still fit for purpose, in particular the Memorandum of Understanding between the Minister of Health and the Minister of Science and Innovation?
9. Are responsibilities between Ministers, the Ministry of Health and MBIE, and the HRC sufficiently clear with regard to policy and strategy for health research?
10. What are the priority-setting processes of the HRC and could they be improved? If so, how?
11. Has the HRC struck the right balance between:
 - a. clinician-driven research and other research?
 - b. basic research, basic targeted research, applied research and development-led research, given other funding mechanisms and the scale of health research undertaken offshore?
 - c. Short-, medium- and long-term research projects or programmes?
 - d. discrete research projects and funding to support sustainability of the research workforce and institutions?

Impact

12. How could the visibility and profile of the HRC be enhanced, nationally and internationally?
13. How could the HRC improve or accelerate the uptake of the results of health research and better connect with end users?
14. Are there more opportunities to improve the commercialisation of research outputs? If so, are the roles of the HRC, Callaghan Innovation and university commercialisation offices clear?
15. Do the funding arrangements for HRC sufficiently recognise and incentivise research that achieves multiple outcomes? How could research that spans health and other outcomes, including economic and environmental objectives, be best coordinated?
16. Is the level of HRC funding commensurate to the current and expected impacts of the HRC, relative to funding across the science sector?

Methods

The strategic refresh exercise will develop a set of criteria and measures against which each question will be addressed. The HRC's performance framework will serve as a useful base for assessing impact. Where appropriate, comparisons will be drawn with other health research agencies, such as the Australian and UK medical research councils. Any comparisons will take into account country-specific health and economic factors.

Key information sources include:

- the relevant literature on health research, in particular the international literature on the impacts of health research
- HRC documentation (Statements of Intent, Statements of Performance Expectations, Annual Reports, Investment Impact Reports, the six-yearly bibliometric study, contract data)
- interviews with key stakeholders (health researchers, HRC staff and board members, clinicians, end users, DHBs, Callaghan Innovation, medical technology firms, other funding agencies).

Planning and implementation arrangements

The Ministry of Health and the Ministry of Business, Innovation and Employment will jointly lead the project. A reference group, comprising senior officials from both agencies, will meet on a monthly basis to ensure effective oversight of the project.

Officials will report to joint Ministers by June 2015 with a detailed report, which will include a set of recommendations aimed at enhancing, if necessary (i) the impact and value for money of the HRC; (ii) the strategic orientation of the HRC; and (iii) the visibility and profile of the HRC.

HRC processes, investment streams and profile

The HRC is well regarded by health researchers. It is seen as a trusted organisation. One university described the HRC as its 'preferred funder'. The HRC's processes are seen as being rigorous, robust and efficient. Some interviewees have identified processes that they think could be improved.

There is general support for the HRC continuing to be the main avenue for funding health research through a contestable funding process. Different views were expressed on the appropriate balance between investigator-led and mission-led research.

Philanthropic organisations and health sector agencies expressed their strong support for the HRC's partnership programme and were interested in making greater use of the programme to co-fund targeted research initiatives.

Most interviewees consider that the HRC's mix of investment and funding streams is about right. There were discussions about possible gaps in funding, priorities given to different types of funding (eg, biomedical, public health, Māori health) and the balance between the HRC's funding mechanisms.

Interviewees noted that the HRC is not identifying and visibly promoting the benefits of health research generally and the specific impacts from the health research it funds.

The HRC is highly visible with those it funds but not among researchers in disciplines not traditionally funded by the HRC: the commercial sector, DHBs (particularly those in smaller centres), consumer groups, and the general public.

Level of HRC funding

There was a general consensus among focus group participants that funding for the HRC is too low and the funding streams within the HRC are in danger of becoming too small to be effective.

Health research funding landscape

There was general agreement among interviewees that basic research in biomedical science is an important component of the health research pipeline. Interviewees also talked about the importance of undertaking New Zealand research in the fields of public health, Māori health, Pacific health, health systems and delivery of health services.

Researchers expressed concern about the current lack of support for career pathways in health research, in particular for early career researchers and Māori/Pacific researchers. Some expressed a concern that New Zealand is in danger of losing its best health researchers overseas because of inadequate funding for health research. Researchers believed that workforce support was the role of both the HRC and universities.

The commercial sector and some researchers identified that more emphasis should be placed on research of more immediate application and on the commercialisation of research. Funding gaps, such as for clinical trials, meant that there were missed opportunities.

Many interviewees commented that there is confusion in the science and health sectors about the purposes of the various sources of funding available for health research.

Researchers expressed concern about the establishment of the National Science Challenges (NSCs), which they saw as not effectively utilising the already established and highly regarded processes of the HRC for relevant health-related challenges.

A strong message was given that research plays an important role in the delivery of quality and cost-effective health interventions. However, there does not appear to be a clear understanding across the health sector and government about the role of health research and the links between research and clinical practice, policy and implementation.

Opportunities exist to enhance connections between the HRC and other institutions and mechanisms in the innovation system, such as Callaghan Innovation, MBIE and KiwiNet, to ensure better alignment and to maximise the value health research makes to economic outcomes.