

# NEW ZEALAND HEALTH RESEARCH STRATEGY

2017-2027

—  
EXCELLENCE  
COLLABORATION  
TRANSLATION  
IMPACT  
—



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## Ministers' foreword

This first New Zealand Health Research Strategy brings together science, health, research and innovation to form a more cohesive system that will have the greatest impact on the lives of New Zealanders.

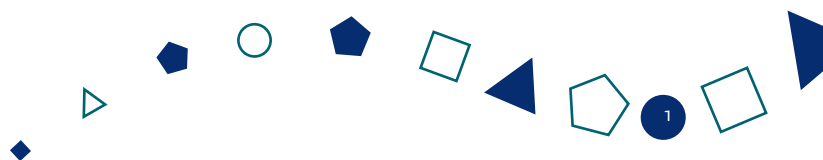
New Zealand has internationally recognised strengths in health research. With these strengths, we can contribute to the international scientific endeavour, address local problems and make the best use of knowledge generated offshore. Dedicated investment in health research in New Zealand gives us the capacity we need to generate innovative ideas, tap into global science and effectively translate research findings into policy and practice in the health, disability, social and science sectors.

Health research is central to New Zealand's national innovation system. The Government, the tertiary education sector, the health sector and private enterprise all have particular roles in making it successful. This strategy provides the foundation for the health sector to play a leading role in health research and innovation. The sector's contribution will help realise the benefits from our investments in health research and make the most of the wealth of knowledge and evidence generated offshore.

Budget 2016 saw the largest-ever increase in funding for health research in New Zealand. By 2020, annual investment in the Health Research Council (HRC) will increase to \$120 million. This 10-year health research strategy will ensure that HRC funding and other resources invested in health research have the greatest impact.

The Government's vision is for New Zealand to have a world-leading health research and innovation system that is founded on excellent research and improves the health and wellbeing of all New Zealanders. A set of guiding principles, strategic priorities and immediate actions will help to achieve this vision by 2027.

Responsible agencies will work to embed four guiding principles into the health research and innovation system: research excellence, transparency, partnership with Māori, and collaboration. These principles will guide all policy settings, investment decisions and operational procedures.



Four strategic priorities will focus effort on: (1) investing in research that addresses the health needs of New Zealanders; (2) creating a vibrant research environment in the health sector; (3) building and strengthening pathways for translating research findings into policy and practice; and (4) advancing innovative ideas and commercial opportunities. The Ministry of Business, Innovation and Employment, the Ministry of Health and the HRC will lead the implementation of these priorities.

This strategy has been developed following an extensive consultation process in 2016. More than 500 people attended regional consultation meetings and targeted focus groups, and 166 written submissions were made in response to the public discussion document. The high levels of interest and involvement reflect the importance New Zealanders place on health research – an attitude also highlighted in the recent opinion poll that New Zealanders for Health Research commissioned.

As Ministers responsible for the health and science systems, we will oversee the implementation of this strategy. Officials will report to us on a six-monthly basis which will inform the strategy over time. An advisory group, comprising expert counsel from across the system, will advise on implementation of the strategy.



**Hon Dr Jonathan Coleman**  
Minister of Health



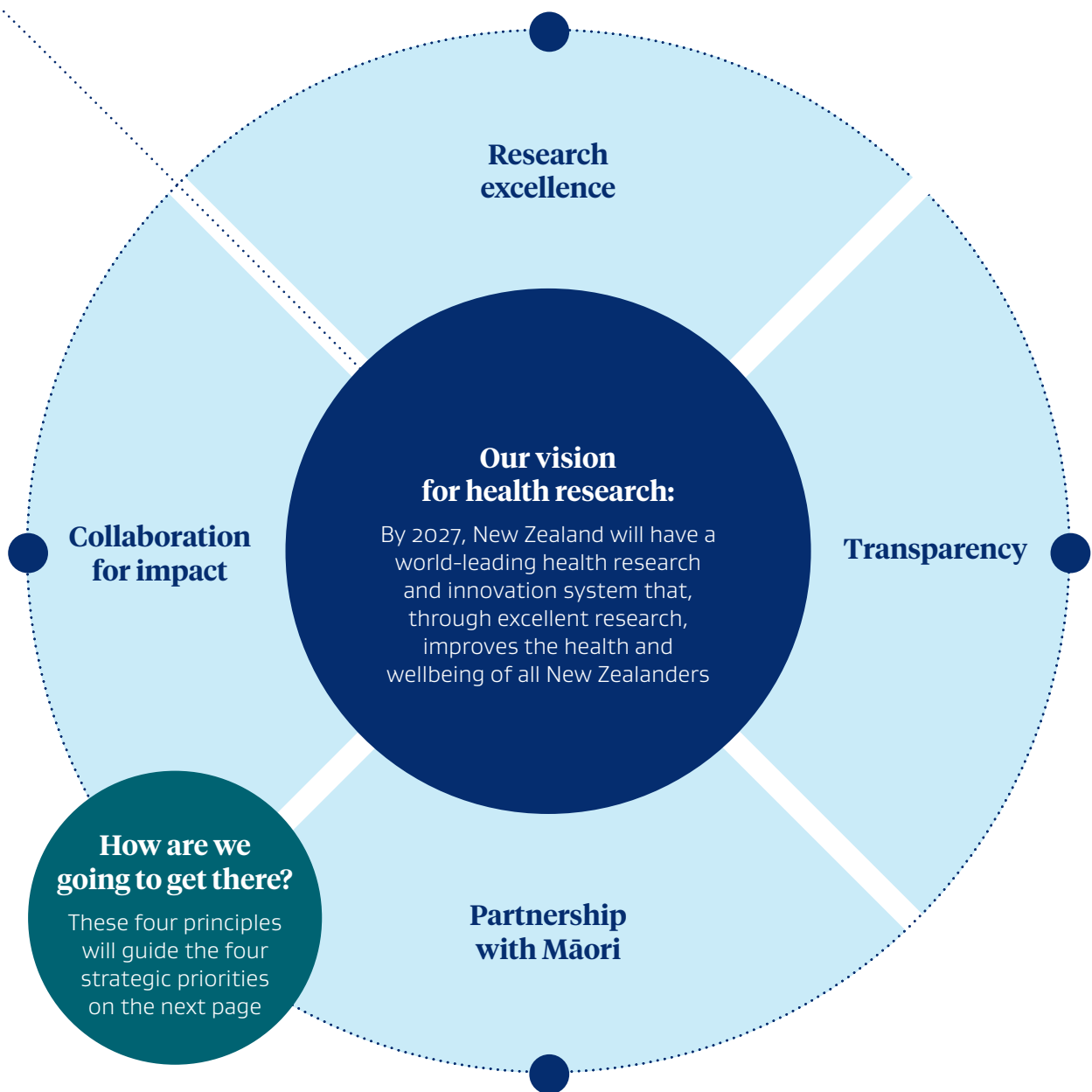
**Hon Paul Goldsmith**  
Minister of Science  
and Innovation

June 2017

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# Where are we heading?



## Strategic priority

# 1

### Invest in excellent health research that addresses the health needs of all New Zealanders

**ACTION 1:**

Prioritise investments through an inclusive priority-setting process

**ACTION 2:**

Invest in research for healthy futures for Māori

**ACTION 3:**

Invest in research that results in equitable outcomes for Pacific peoples and helps them to lead independent lives

**ACTION 4:**

Develop and sustain a strong health research workforce

## Strategic priority

# 2

### Create a vibrant research environment in the health sector

**ACTION 5:**

Strengthen health sector participation in research and innovation

**ACTION 6:**

Strengthen the clinical research environment and health services research

## Strategic priority

# 3

### Build and strengthen pathways for translating research findings into policy and practice

**ACTION 7:**

Enable and embed translation across the health sector

## Strategic priority

# 4

### Advance innovative ideas and commercial opportunities

**ACTION 8:**

Support transformative and innovative ideas

**ACTION 9:**

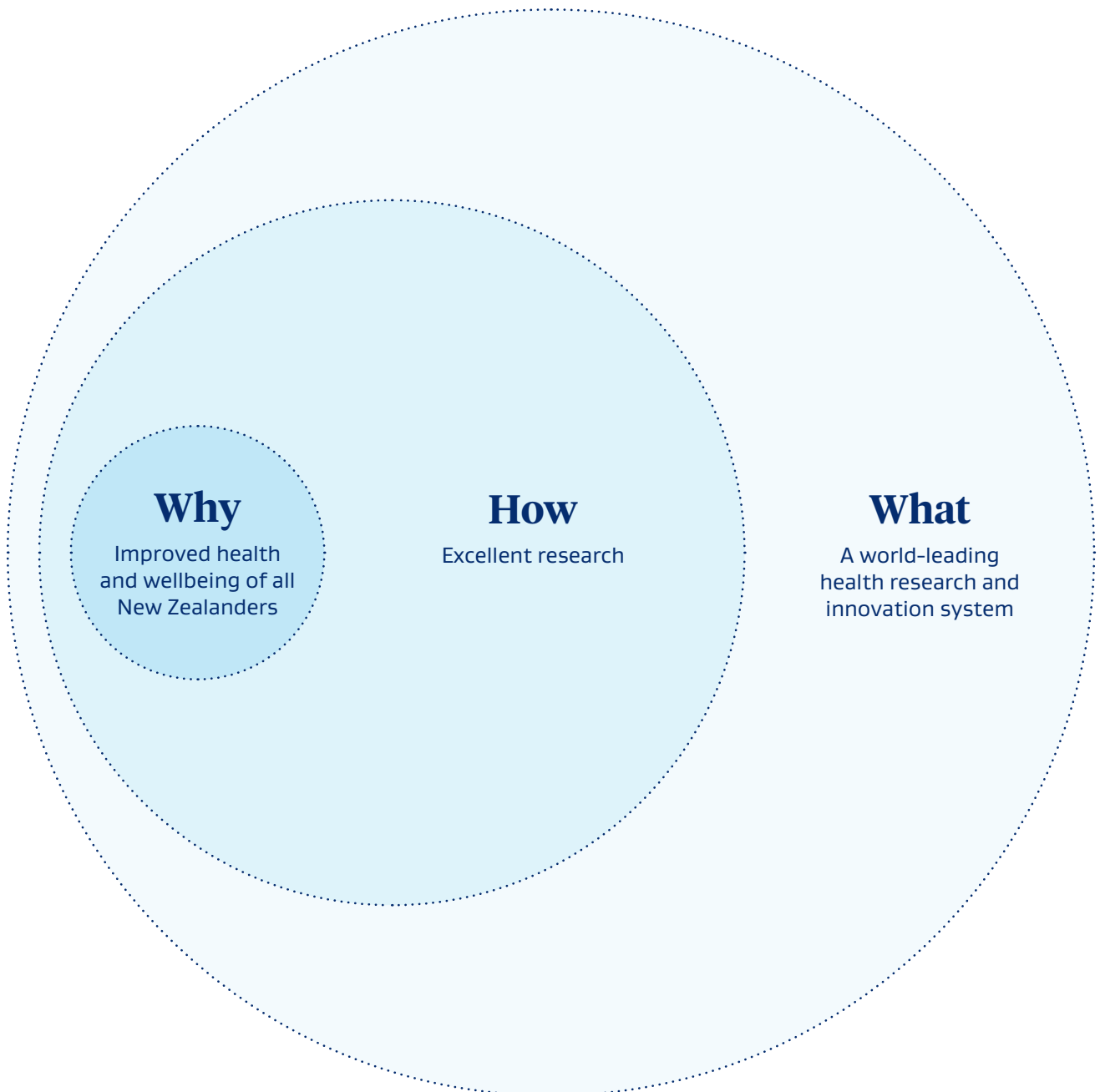
Create more industry partnerships

**ACTION 10:**

Strengthen platforms for commercialising innovations

# 1. The Vision

By 2027, New Zealand will have a world-leading health research and innovation system that, through excellent research, improves the health and wellbeing of all New Zealanders.





This vision of the New Zealand Health Research Strategy seeks to increase the impact of government investment in health research.

The vision contains three parts, each of which is described below.



**WHY - The health research and innovation system has impact. It improves the health and wellbeing of all New Zealanders with the result that:**

- all New Zealanders have equity of health outcomes
- quality of life improves across all age and population groups
- disabled people have the highest standards of health and wellbeing possible
- better health outcomes influence and improve social outcomes
- a healthier population, a more effective and efficient health system and a thriving medical technology environment produce greater social and economic wellbeing.



**HOW - Excellent research:**

- adopts fit-for-purpose and rigorous methodologies and approaches
- gains global recognition for health researchers and institutions
- covers all health research areas, including health services research
- contributes to understanding of the determinants of health

- gains the active involvement of consumers and communities
- happens across and between disciplines
- maximises use of New Zealand's distinctive features, such as rich data infrastructure, diverse populations and a strong indigenous health research sector
- capitalises on the potential of linked data and big data along with rich qualitative data
- is conducted ethically and in line with international best practice.
- undertakes high-quality health services research
- effectively translates findings into policies, practices and improved understanding
- is internationally connected, contributing to the global health research endeavour and applying findings from offshore
- has an appropriate mix of funding models to support both agreed priorities and serendipity
- contains consumers, researchers, academia, health providers, philanthropists, communities, not-for-profit organisations and industry that invest in the system and collaborate with each other



**WHAT - A world-leading health research and innovation system:**

- supports all types of excellent and ethical health research cost-effectively
- targets the current and future health needs of the populations it serves, including high-risk populations
- generates new knowledge, including evidence for raising health system performance
- has government investment in health research that is proportionate to public investment in the health system
- supports a vibrant Māori health research sector
- builds strong Pacific health research capacities
- has regulatory systems that are effective and responsive to the changing research environment
- captures spillovers between human health, environmental health and animal health
- generates commercial value from its innovations
- is future-focused, engaging with emerging and new technologies – for example, genomics, gene technologies and personalised medicine.

## 2. Guiding principles

Four guiding principles will help achieve the strategy's vision to increase the impact of government investment in health research.

### 1. Research excellence

- Embrace and value a range of research approaches and methodologies that are fit for purpose and rigorous. Investment supports without bias a broad range of paradigms, approaches, methodologies and methods, but scientific rigour and well-designed methodologies are paramount.
- Create the environment to generate innovative ideas: a funding system that supports transformative and innovative ideas from researchers and consumers.
- Conduct ethical research that keeps research participants safe, protects the privacy of individuals, and respects the mana of families and whānau.

### 2. Transparency

- Uphold transparent and robust investment processes: select the best research through a mix of funding models and rigorous assessment.
- Share ideas and information freely and openly.
- Make findings from research, quality improvement studies and evaluations easy to discover and access.
- Evaluate what works on a regular basis and make required improvements. This includes monitoring research activities and projects frequently; and regularly evaluating the relevance, efficiency, effectiveness, outcomes and impact of investments.

### 3. Partnership with Māori

- Make the Treaty of Waitangi principles part of all health research:
  - **partnership** – the Crown working with iwi, hapū, whānau and Māori communities to improve Māori health and wellbeing through research
  - **participation** – actively engaging with Māori health stakeholders (whānau, hapū, iwi and community) and supporting Māori-led research initiatives
  - **protection** – ensuring research contributes to equity for Māori health and wellbeing.
- Use He Korowai Oranga<sup>1</sup> (the Māori Health Strategy) and the principles of Vision Mātauranga<sup>2</sup> to:
  - set priorities for Māori health research to seize opportunities for and address the challenges to Māori health and wellbeing.
  - harness the innovation potential of Māori health knowledge, systems and processes.
- Translate relevant findings into gains in health and social wellbeing for Māori.
- Promote rangatiratanga – enable whānau, hapū, iwi and Māori individuals to exercise control over their own health and wellbeing and the direction and shape of their own institutions.

### 4. Collaboration for impact

- Look widely across the science and health systems and work collaboratively across disciplines, institutions, communities, sectors and countries to capitalise on specialist skills and different perspectives.
- Involve communities, health consumers and disabled people in the research process.
- Harness interactions between professional practice, research and education.
- Form partnerships and develop cooperative arrangements.
- Foster public engagement on the implications of new knowledge, innovations and technologies on health for all New Zealanders.

### 3. Strategic priorities and supporting actions

Along with the guiding principles, four strategic priorities will help achieve the strategy's vision. Each priority includes supporting actions, which will be the immediate focus for the Government.

Developing the strategic priorities and supporting actions has involved considering the summary of submissions and consultation,<sup>3</sup> review of relevant literature, and overseas models and strategies for health research<sup>4</sup>.

The following are the four strategic priorities that set the direction for the health research and innovation system and that collectively will increase the impact of health research.

1. **Invest in excellent health research that addresses the health needs of all New Zealanders.** The Health Research Council (HRC) will lead this work with support from the Ministry of Health and the Ministry of Business, Innovation and Employment (MBIE).
2. **Create a vibrant research environment in the health sector.** The Ministry of Health will lead this work with support from MBIE and the HRC.
3. **Build and strengthen pathways for translating research findings into policy and practice.** The Ministry of Health will lead this work with support from MBIE and the HRC.
4. **Advance innovative ideas and commercial opportunities.** MBIE will lead this work with support from the Ministry of Health and the HRC.

This section explains why each of these strategic priorities is essential in developing a world-leading research and innovation system and sets out initial actions that will help to achieve them.

## **Strategic Priority 1:** Invest in excellent health research that addresses the health needs of all New Zealanders

A world-leading health research and innovation system builds on existing knowledge, generates new knowledge and responds to the needs of the populations it serves. Meeting this challenge requires a combination of conducting New Zealand-based research and using research conducted offshore. It also requires a system where the Government invests in health research at a level that is proportionate to public investment in the health system.

New Zealand health research is internationally recognised for its scientific contributions – see Appendix B for examples of world-leading scientific breakthroughs from New Zealand researchers.

The focus of health research carried out in New Zealand and funded by the Government will be on addressing the current and expected health needs of the different groups within New Zealand's population. Two trends significantly influencing those needs are that New Zealand's population is ageing and is also becoming more diverse.

As a small country, we need to ensure our research system is well connected with global research efforts. Some New Zealand research will involve generating new knowledge but, given that the vast majority of knowledge is generated offshore, much of it will involve applying and adapting international knowledge to the New Zealand context. Adaptation is needed as research conducted offshore will not always generate the evidence base and insight needed for New Zealand.

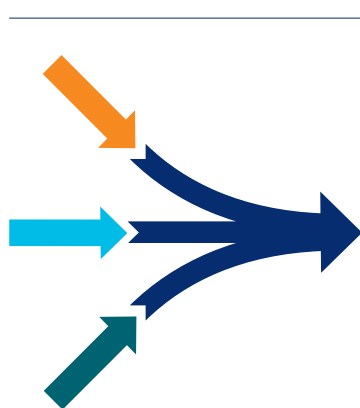
Excellent, world-leading research conducted in New Zealand will contribute significantly to international knowledge. To deliver excellent research, researchers here will need to continue deepening international partnerships and make effective use of knowledge generated offshore. New Zealand partners will often bring a particular New Zealand lens to the research project.

Strong and enduring engagement with communities and consumers is required to ensure research responds to the health needs and experiences of New Zealanders. Kaupapa Māori and Pacific research methodologies provide some good practice examples of how to engage with consumers and communities in a New Zealand context.

The HRC will lead the implementation of this strategic priority with support from MBIE and the Ministry of Health. This leadership is in line with the HRC's role as the Government's primary funder of health research and the strategic role recommended for the HRC in the 2015 strategic refresh.<sup>5</sup>

The supporting actions for Strategic Priority 1 are to:

1. prioritise investment through an inclusive priority-setting process
2. invest in research for healthy futures for Māori
3. invest in research that results in equitable health outcomes for Pacific peoples and helps them to lead independent lives
4. develop and sustain a strong health research workforce.



#### **ACTION ONE:**

**Prioritise investments through an inclusive priority-setting process**

A world-leading health research and innovation system responds to the current and future health needs of the populations it serves.

The system should have an appropriate mix of types of research, such as biomedical sciences, public health research, clinical research and health services research. A range of funding models is needed to support the generation of new knowledge. Funding should support both agreed priorities and innovative ideas that researchers and consumers propose. Funding for health research in New Zealand will support a mix of research driven by top-down priorities and bottom-up research initiatives.

The HRC will develop a priority-setting process to advise the Minister of Health and the Minister of Science and Innovation on health research priorities for New Zealand. The priority-setting process will be inclusive, involving consumers, researchers, health sector agencies, health practitioners, philanthropic bodies, iwi, Pacific peoples, community organisations, disabled people and government agencies.

The priority-setting process will consider research that:

1. helps to advance the priorities of the New Zealand Health Strategy and/or the National Statement of Science Investment (see Appendix A for more on these priorities)
2. will improve health outcomes and address the burden of disease – for example, in mental health
3. improves understanding of the various determinants of health, including social, environmental and occupational factors
4. will contribute to achieving health equity across New Zealand's diverse populations and communities
5. achieves health equity for Māori and reflects the principles of He Korowai Oranga and Vision Mātauranga
6. responds to new and emerging threats to health

7. is in an area where New Zealand has international standing or leadership
8. has the potential to be disruptive and is highly novel and innovative
9. complements offshore research
10. is in an area in which New Zealand has a significant interest, such as Pacific health research.

The priorities identified through the process will form the basis of the HRC's three-yearly investment plan. They will also guide other areas of Government-funded, mission-led research such as the National Science Challenges, health sector agency research and health research commissioned by government agencies. The Government will develop new approaches for co-investment with the not-for-profit sector on the agreed priorities.

Other funding mechanisms in New Zealand's health research and innovation system, such as academic institutional funding, the Centres of Research Excellence and the Marsden Fund, will continue to support curiosity-driven health research that may or may not fit with these priorities.



## **ACTION TWO:**

### **Invest in research for healthy futures for Māori**

The Government and Māori will work in partnership to improve Māori health outcomes through investments in research. This action has a five-pronged approach.

1. Work alongside Māori stakeholders (researchers, iwi, hapū, groups and communities) to develop an 'ara' (pathway) for Hauora Māori research. The ara will:
  - set priorities for Māori health research based on the allocation of resources in the areas that will best achieve Māori health gains, and the broad priorities identified in He Korowai Oranga and the New Zealand Health Strategy
  - draw on and develop Māori health frameworks and Māori community development models
  - recognise the special legislative roles and requirements district health boards have in partnering with Māori to improve Māori health
  - evaluate the effectiveness of current funding arrangements and ensure that appropriate systems are in place to fund research that helps to improve Māori health
  - establish best practice approaches for research and access to findings.

2. Develop guidance on how to ensure that research is responsive to Māori and appropriately conducted.
3. Develop and refine criteria for funding mechanisms so that they give appropriate weighting to the principles of Vision Mātauranga and He Korowai Oranga.
4. Ensure the growth and ongoing development of the Māori health research workforce.
5. Provide mechanisms to support the ongoing professional development of the non-Māori workforce to help improve Māori health.



**ACTION THREE:**

Invest in research that results in equitable outcomes for Pacific peoples and helps them to lead independent lives

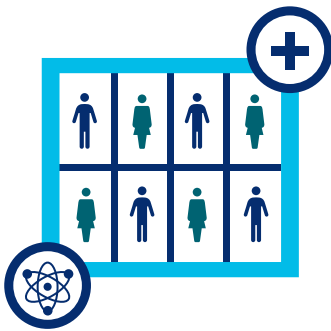
The Government and Pacific peoples will collaborate to improve the health of Pacific peoples through investments in research.

‘Ala Mo’ui<sup>6</sup> sets out the strategic direction to address health needs of Pacific peoples and specifies priorities for action. To achieve the vision of ‘Ala Mo’ui, a strong evidence base for policy interventions is needed.

This action has six parts.

1. Continue to develop Pacific health research leadership, capability and capacity by establishing ring-fenced funding for Pacific health research.
2. Have specific representation of Pacific peoples on relevant governing bodies.
3. Undertake a stocktake of Pacific health research to provide a knowledge bank.
4. Develop opportunities to link with Pacific health research across the Pacific region.
5. Provide incentives to encourage more people from Pacific communities to become researchers.
6. Acknowledge and promote cultural methods and approaches of research that are effective for Pacific peoples.





#### **ACTION FOUR:**

##### **Develop and sustain a strong health research workforce**

The Government will put appropriate mechanisms in place to support, attract and retain the health research workforce.

Producing excellent health research is dependent on the quality of human skills and capabilities. Health researchers and health practitioners are internationally mobile workforces and highly sought after. This action will invest in, support, attract and retain the health research workforce in the following areas:

- health practitioners with an interest in research
- young and emerging researchers
- mid-career researchers
- Māori health researchers
- Pacific health researchers
- health researchers with an interest in disability
- experts in new emerging technologies
- data scientists, biostatisticians, health economists and multidisciplinary researchers.

The HRC will take the lead, given its strategic role in building health research capability in New Zealand. Universities, health professional organisations, the philanthropic sector, other research organisations and community groups also have vitally important roles to play. An essential part of this work will be to map workforce training with the likely portfolios of research over time.

Statistics New Zealand has a role in building the capability of researchers in data provision, analysis and data translation.

## Strategic Priority 2: Create a vibrant research environment in the health sector

Primary care providers are particularly important in certain areas, such as mental health.

A world-leading health research and innovation system has a vibrant research environment in the health sector. The health sector is a key part of New Zealand’s national innovation system, performing research, generating knowledge and making the most of innovations. All levels of care, from primary care through to specialist quaternary providers, have a role to play in the health research and innovation system.

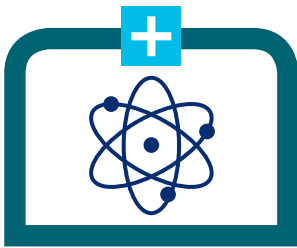
The health sector has a role in setting the research agenda and in participating in all types of research. It has a critical role in health services research and in translating research findings into policy and practice. It can encourage practitioners to take up new ideas by involving health professionals in research, evaluation, quality improvement and improved service delivery.

Ongoing engagement with the tertiary education sector is essential for developing a skilled clinical and research workforce.

The Ministry of Health will lead the implementation of this strategic priority with support from MBIE and the HRC.

The supporting actions for Strategic Priority 2 are to:

1. strengthen health sector participation in research and innovation
2. strengthen the clinical research environment and health services research.



### **ACTION FIVE:**

#### Strengthen health sector participation in research and innovation

The Government will work to make the health sector an integral part of the health research and innovation system. For health service agencies to achieve their objectives of improving health and reducing inequities, they need a strong evidence base. In turn, to achieve this evidence base, they need an environment and culture of enquiry and innovation with research integrated into health care systems and population health initiatives. The health sector needs to prioritise research on health services and the delivery of health promotion, disease/injury prevention and health care.

Many research activities already occur in health sector agencies, particularly in district health boards. There remain opportunities to improve the environment and culture for research and innovation. As part of its stewardship role, the Ministry of Health will engage with the health sector on how best to act on these opportunities. This engagement will



include framing expectations, addressing barriers and making the most of opportunities. It will also consider funding models and infrastructure requirements. Investment in infrastructure and effective governance of research is needed.

#### **ACTION SIX:**

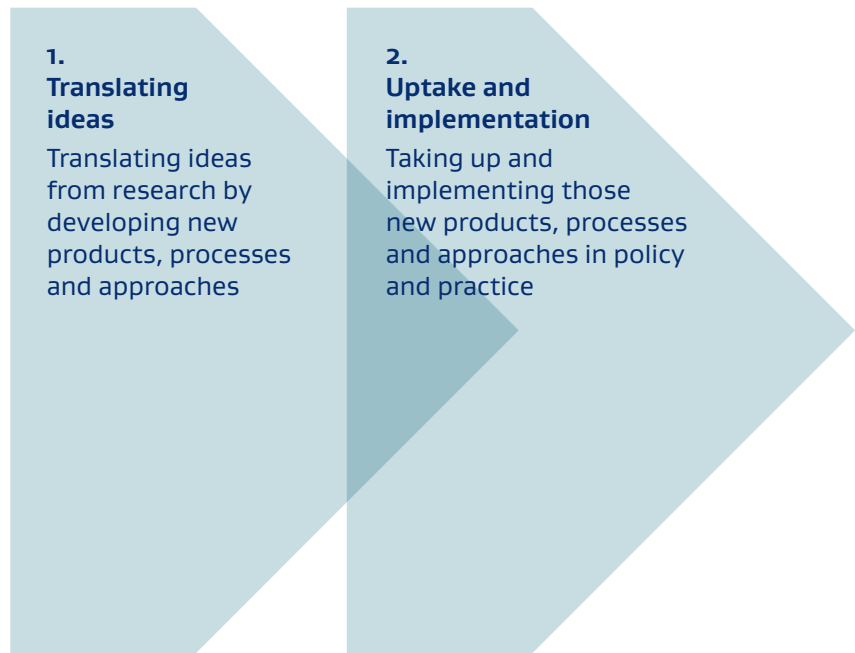
##### **Strengthen the clinical research environment and health services research**

The health sector has a particular leadership role in clinical research. Clinical research usually takes place in health service agencies and involves a wide variety of clinical staff, including doctors, nurses and allied health professionals. Clinical research in New Zealand could be strengthened by further embedding research into clinical networks, improving the environment for clinical trials and promoting industry investment. The regulatory environment needs to continue to be robust so that clinical trials follow safe and ethical research practice and are internationally competitive.

Rising public expectations for health care, coupled with new technologies and innovations, are increasing the cost pressures on the health system. To help effectively tackle these challenges, more excellent research into the most effective models and ways to deliver care is needed. Health services research needs to be strengthened. Quality improvement studies and technology assessments are also essential to forming a quality evidence base on what works.

The Ministry of Health will work with district health boards, other health sector agencies, health professional organisations, clinical networks, tertiary education organisations, consumers and industry to strengthen the clinical research environment and health services research in New Zealand.

## Pathways for translating research findings into innovations, policy and practice



## A world-leading system for translating research requires all of the following ingredients



### Strategic Priority 3: Build and strengthen pathways for translating research findings into policy and practice

A world-leading health research and innovation system responds to the current and future needs of the populations it serves. It uses research findings effectively to make a difference to people's health and lives. New technologies and personalised medicine provide opportunities for researchers to address questions that will lead to significant improvements in models of care.

New Zealand produces a very small fraction of global health research. This means that the New Zealand system must strongly emphasise translating discoveries, innovations and evidence from offshore to the New Zealand context. The most effective people to translate such research findings are those who directly use those findings.

Consultation highlighted that not enough work has been done on translating research into practice. This message is consistent with the international literature on health research, which finds a lack of attention to making use of existing knowledge. This lack of translation has led to many missed opportunities for improving health outcomes and reducing costs.

Translation has two aspects: (1) translating ideas from research by developing new products, processes and approaches; and (2) taking up and implementing those new products, processes and approaches into policy and practice. The strongest message from the consultation was the need to address the second aspect of translation.

New Zealand lacks frameworks and mechanisms for translating research findings into policy and practice. No one agency or part of the system has overarching responsibility for this task. District health boards and the Ministry of Health have particularly important roles to play in strengthening the focus on translation in the future. As steward of the health system, the Ministry of Health will work with district health boards to ensure effective translation.

There is a lack of research specifically aimed at translating research findings into policy and practice. Health services research, implementation research, behavioural studies, evaluation and technology assessments have received relatively little investment. New Zealand currently has limited capacities in these areas.

A world-leading system for translating research requires all of the following features.

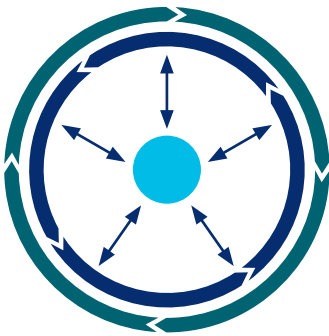
- **Strong and enduring partnerships between the research community and users of the research.** Representation on research decision-making bodies needs to reflect strong partnerships between researchers, consumers, communities, Māori and health sector agencies. Appropriate representation

can help to set the research agenda and to translate research findings into policy and practice. Partnerships may take the form of virtual and actual research and knowledge centres, networks of expertise, and sharing of resources where appropriate.

- **Involvement of communities and consumers in the research process.** Engagement is not currently systematic or explicitly required across the system. However, engaging with communities is already a critical part of Kaupapa Māori and Pacific research methodologies, so the opportunity is available to apply these practices more widely.
- **Investment in quality improvement and evaluation to inform evidence-based practice.** Research alone is insufficient to translate findings into better policies and practices. Quality improvement studies and evaluation are also critical to generating evidence and insights.
- **Evidence to establish the benefits of an intervention across populations and relative to other interventions.** Once a treatment or practice is shown to be effective, data is required to evaluate the clinical success and cost-effectiveness of the new and existing interventions. A more structured approach to making decisions on whether and how to adopt new interventions would strengthen translation.
- **Research into the organisational structures that deliver health interventions** would highlight where to make improvements and efficiencies.
- **Dissemination of research findings and innovations across the health sector.** At present it can be hard to find information on what works and what does not. To address this need, several other countries have developed specific approaches including clearinghouses, dedicated research expertise within government agencies, and structures to support collaborative working across the research, policy and delivery sectors.

The Ministry of Health will lead the implementation of this strategic priority with support from MBIE and the HRC.

One key action will support Strategic Priority 3.

**ACTION SEVEN:****Enable and embed translation across the health sector**

To translate research effectively, the health sector and the research sector need to work together seamlessly. In particular, translation needs to be part of the strategic frameworks of health delivery agencies and health research organisations, and in the everyday work of those involved in health research. The Government will ensure that:

- relevant entities understand their role in translating research
- work is well-coordinated across relevant institutions
- mechanisms for translating knowledge from offshore work well
- data assets are linked, accessible and well-governed
- investment plans for funding agencies reflect the importance of translation
- policies support open access to research findings
- a clearinghouse for health research is established and maintained.

## Strategic Priority 4: Advance innovative ideas and commercial opportunities

A world-leading health research and innovation system will sustain excellent research capacities and capabilities. It will allow innovative ideas – from researchers, health practitioners, consumers or communities – to flourish. Many of the most innovative scientific and technological breakthroughs have emerged through transformative ideas that had support from government funding. Increasingly, international collaborations are coming up with transformative ideas and many involve research across disciplines.

A world-leading system should also support the best innovative ideas through various mechanisms. Many ideas will lead to research programmes and some will end up forming the basis for new products, processes and practices. The use of some of these innovations, such as new practices, will need to spread across the health system without commercial gain. However, firms will need to market other innovations both in New Zealand and offshore.

MBIE will lead the following three actions with support from the Ministry of Health and the HRC.

The supporting actions for Strategic Priority 4 are to:

1. support transformative and innovative ideas
2. create more industry partnerships
3. strengthen platforms for commercialising innovations.



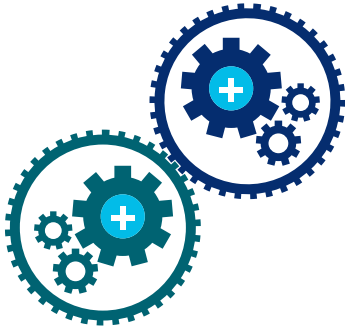
### **ACTION EIGHT:**

#### Support transformative and innovative ideas

The Government will increase the share of funding for supporting transformative and innovative ideas across the research spectrum. This will enable a dynamic system that supports novel ideas and researchers with a limited or no track record.

Big data and genomics are becoming increasingly important in generating new insights and knowledge. The Government will ensure appropriate support for these areas and effective governance of data.



**ACTION NINE:****Create more industry partnerships**

The Government will seek to increase the number of partnerships between industry, research institutes and health sector agencies. These partnerships are critical for industry to engage with consumers, test new ideas and market new innovations. Partnerships may extend to formal research centres involving shared investment and governance between research institutes, the health sector and industry.

The Government will also seek to form partnerships with iwi, hapū and communities, government agencies, district health boards, universities, health providers, and regional and local councils to drive Māori health research and other research to address Māori health needs.

**ACTION TEN:****Strengthen platforms for commercialising innovations**

Health research and innovation present significant opportunities for commercialisation. Commercialisation is one way that consumers can gain access to innovation. A world-leading health research and innovation system will capitalise on the opportunities for turning innovations into commercial value. The Government will strengthen platforms for commercialising new innovations and strengthen connections internationally to tap into capital and specialist expertise. Capital is required, especially after the proof of concept for commercialisation has been completed, for advanced pre-clinical work and early phase clinical trials. Of particular importance is the need to use effective partnerships to support the commercialisation of new innovations that health practitioners have created.

## 4. Who will do what?

The actions identified in the previous section are only part of what must be done to achieve the vision. All those involved in the health research and innovation system need to continue to contribute in ways that are not limited to the actions in section 3.

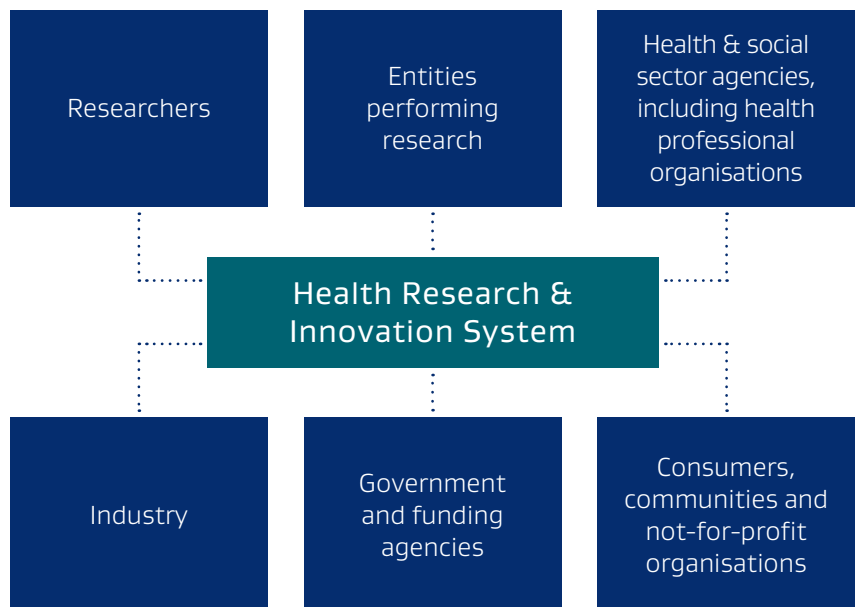
To deliver on the vision and priorities in this strategy, each part of the health research and innovation system must clearly understand its particular contribution, while also collaborating with other parts of the system.

### Responsibilities across the health research and innovation system

All contributors are responsible for:

- identifying key knowledge gaps in improving the health and wellbeing of New Zealanders
- encouraging the system to translate and take up research findings.

## Collaboration and contribution



## Specific responsibilities

Researchers may be in a tertiary education organisation, a health service provider, independent research organisation, community organisation, not-for-profit organisation or business

In addition to the broad responsibilities, the following contributors have specific responsibilities.

### Researchers

- Undertake excellent and ethical research
- Contribute to the international knowledge pool
- Innovate in partnership with consumers, communities and health practitioners
- Share information and data where permissible.

### Entities performing research

- Sustain high-performing teams of researchers
- Develop cooperative arrangements to share and provide excellent facilities and support services
- Foster strategic partnerships with the health sector and world-leading research institutes
- Share information and data where permissible.

### Health and social sector agencies, including health professional organisations

- Foster a culture of enquiry and innovation
- Develop effective pathways for translation
- Identify the most pressing knowledge gaps for improving the health and wellbeing of New Zealanders and influence research agendas accordingly
- Innovate in partnership with researchers, consumers and communities
- Rapidly adopt appropriate and cost-effective knowledge and innovations
- Share information and data where appropriate.

### Consumers, communities and not-for-profit organisations

- Bring the consumer voice to decision making and the research process
- Innovate in partnership with researchers
- Use and disseminate research findings.

### **Government and funding agencies**

- Provide strategic leadership
- Coordinate and align policy settings and investments, simplifying funding arrangements where appropriate
- Support necessary infrastructure
- Provide incentives for excellent research and pathways to impact
- Use research findings
- Regulate to protect research participants and users and to ensure good clinical practice
- Enable the different parts of the system to share information and data
- Monitor and evaluate the whole system robustly
- Cooperate to avoid duplication of research and unnecessary complexity.

### **Industry**

- Invest in research and development
- Partner with academia, communities and the health sector
- Market validated and cost-effective innovations.

## 5. Implementing the strategy

The Minister of Health and the Minister of Science and Innovation will jointly oversee the implementation of the strategy.

MBIE, the Ministry of Health and the HRC will develop a work plan and report to the Ministers every six months at first, evaluating progress made towards the vision. One of these agencies will take the lead for one or more of the strategic priorities (see section 3 for their specific roles) and report on progress made toward completing the related actions.

An advisory group will advise MBIE and the Ministry of Health on the implementation of the strategy. The advisory group will include representation from across the health research and innovation system.

The Government will update the strategy as required and identify additional actions.

### Performance indicators

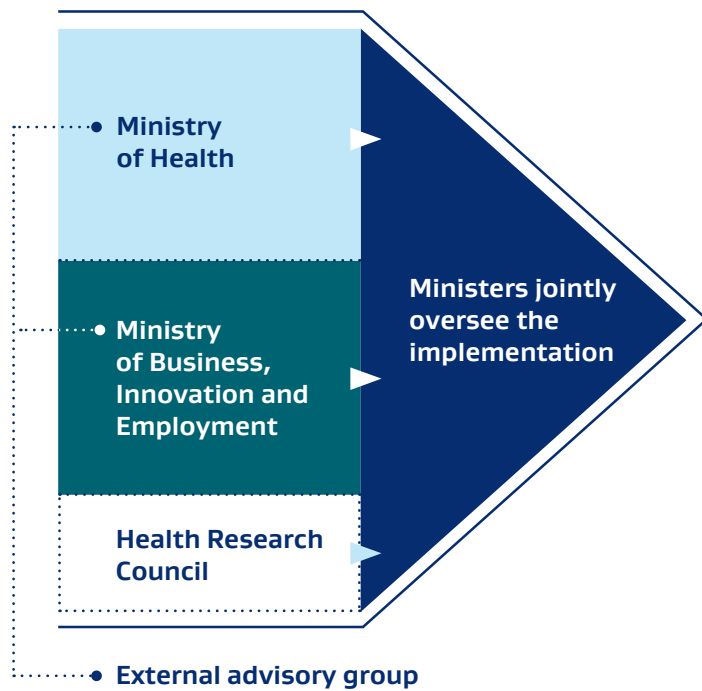
In their regular reporting to the Ministers, MBIE and the Ministry of Health will consider indicators in the following dimensions to monitor and evaluate progress towards achieving the vision:

- amount and types of health research undertaken, including in priority areas
- sources and levels of investment in health research, including measures for co-investment with not-for-profit organisations
- amount and types of research performed in the health sector
- number, types and levels of partnerships and collaborations between researchers, academia, health professionals, community, not-for-profit organisations and industry
- number, types and levels of partnerships and collaboration with offshore research institutions and funding agencies
- levels of consumer and community involvement in research funding decisions and the research process
- number and types of innovations and interventions developed from research to improve equity
- time taken to translate findings into policies and practices
- percentage of research that receives appropriate ethics approval
- time that ethics committees take to approve research proposals
- incidents of harm that those participating in health and disability research experience

- value of production and exports by the med-tech sector (pharmaceuticals, diagnostics, medical devices, health information technology)
- bibliometric measures for health research undertaken in New Zealand
- number and types of research projects using New Zealand’s rich health and social data infrastructure
- number and types of research undertaken to reduce inequities and improve health outcomes for Māori and Pacific peoples
- number and types of research undertaken to reduce inequities and improve health outcomes for disabled people.

International benchmarks will be used where possible to measure performance.

## Towards achieving the vision



## 6. Development of the strategy

Throughout the entire process the strategy working group conducted literature reviews and document analysis.

A steering group of senior officials from MBIE, the Ministry of Health and the HRC oversaw the development of the strategy. The working group from the three agencies reported to the Steering Group.

Developing this strategy through to its final form involved the following steps.

### Step One:

Development of public discussion document from December 2015 to May 2016. (This involved three workshops with a wide range of government agencies.

### Step Two:

Release of the public discussion document on 17 May 2016.

### Step Three:

Consultation period from 17 May to 29 July 2016.

Consultation included:

- written submissions (received 166 submissions)
- 10 regional consultation meetings: four in Auckland, one in Hamilton, two in Wellington, one in Christchurch and two in Dunedin; a total of 275 people attended, 34 of whom indicated an iwi affiliation
- 24 targeted focus groups, with a total of 252 people attending, on 10 topics:
  1. prioritisation of health research
  2. role of health service agencies
  3. workforce
  4. commercialisation
  5. non-profit organisations
  6. funding opportunities with government agencies
  7. health research trends and opportunities
  8. Māori health research
  9. Pacific health research
  10. disability research.

### Step Four:

Analysis of the submissions and feedback from the consultation process, from August to November 2016.

Release of *Summary of Submissions and Consultation* on Ministry of Health website February 2017.

### Step Five:

Development of draft strategy from October 2016 to April 2017.

### Step Six:

Short period of targeted consultation on the draft strategy in May 2017.

### Step Seven:

Finalisation of strategy in late May and early June 2017.

## Appendix A: Relationship with key strategies

The New Zealand Health Research Strategy has strong links with, and contributes to, the following government strategies and priorities.

### **National Statement of Science Investment (NSSI)**

Health research is an integral part of the science system and contributes to wellbeing and productivity. It is expected to contribute significantly to the NSSI's vision of 'a highly dynamic science system that enriches New Zealand, making a more visible, measurable contribution to our productivity and wellbeing through excellent science'.

The NSSI recognises that health research has underpinned many of the advances in the length and quality of human life during the 20th century. Health research has also contributed to New Zealand's growing and innovative sector focused on diagnostics, medical devices and health information technology, and beyond to primary industries.

New Zealand has significant opportunities in health research. We have some outstanding health research strengths and several factors make New Zealand an attractive destination for health research.

The NSSI clearly signals the need to increase funding in the health research sector over time. It also considers how to use research results for greater economic benefit, in addition to the growing social and health benefits that research is already achieving.

With the underlying pillars of the NSSI, science can have a strong focus on the eventual benefits of research for individuals, businesses and society. The pillars are:

- excellence: well-designed, well-performed, well-reported research
- impact: research that generates health, social, environmental and economic benefits for individuals, communities and society.



## New Zealand Health Strategy

Health research is integral to implementing the New Zealand Health Strategy and achieving its vision for all New Zealanders to 'live well, stay well and get well'.

- Research advances all five themes of the New Zealand Health Strategy in the following ways.
1. **People powered** – effectively co-design research and health care in a way that:
    - listens to consumer voices throughout the research process, especially voices from communities with the poorest health
    - shares research findings with New Zealand communities to take a partnership approach to health care and wellbeing.
  2. **Closer to home** – use evidence from research in New Zealand and overseas to inform the:
    - design of integrated health services and population health interventions
    - care provided to individuals, especially in managing long-term conditions
    - best investments for health and wellbeing early in life.
  3. **Value and high performance** – value and prioritise the use of evidence in decision-making across the health system, including to achieve:
    - equity of health outcomes
    - quality improvement in health services
    - best investment approaches to address complex health and social issues.
  4. **One team** – work together to improve the health of New Zealanders by:
    - collaborating between researchers, universities, health providers and industry
    - sharing and spreading evidence-based knowledge and practice
    - building research expertise in the health workforce
    - building clinical understanding in the research and development workforce
    - protecting the physical wellbeing of research participants and respecting privacy.

#### 5. **Smart system** – use research to inform a ‘learning’ health system by:

- rapidly translating evidence into practice and policy through collaboration between researchers and the health sector
- evaluating new clinical interventions, public health approaches and digital technologies
- helping to determine system performance indicators
- identifying how to reduce waste in the health system (eg, informing the ‘Choosing Wisely’ campaign)
- making best use of large and linked data sets
- discovering, learning and sharing effective innovations across the system
- having data and smart information systems that improve decision-making.

#### **New Zealand Disability Strategy**

Health research will support and direct efforts to address Outcome Three of the New Zealand Disability Strategy:

‘to enable disabled people to have the highest attainable standards of health and wellbeing’. In making this contribution, research on the health and wellbeing of disabled people will:

- be methodologically robust
- consult with disabled people and actively involve them in developing and conducting research that concerns their health and wellbeing
- address issues that will make services for disabled people higher quality, more inclusive and more accessible
- take an ethical and informed approach to the participation and involvement of disabled people in research.

#### **Social investment approach**

Health research is integral to the social investment approach to improving the lives of New Zealanders. Health research:

- achieves a clearer understanding of needs through providing better information and better use of technology
- enables analysis, measurement, evaluation and targeting of resources
- enables better long-term results for those in need
- identifies the best ways to achieve these results.

## Appendix B: Health research in New Zealand

### Milestones

<b>1875:</b>	New Zealand's first medical school opens at the University of Otago.	<b>1997:</b>	HRC funding transfers from the Ministry of Health to the Ministry of Research, Science and Technology so that the Ministry can implement the full-cost funding model across the science system.
<b>1920:</b>	The Health Department begins promoting and carrying out research into public health and preventing or treating disease, following the Health Act 1920.	<b>2000:</b>	The New Zealand Public Health and Disability Act 2000 establishes a national ethics review system for health and disability research.
<b>1937:</b>	The Health Department establishes its own departmental committee for medical research.	<b>2001:</b>	The <b>Centres of Research Excellence (CoREs) programme</b> is created. It has since supported many centres performing health research, including the Maurice Wilkins Centre, Brain Research New Zealand, MedTech CoRE, the Riddet Institute and Gravida.
<b>1950:</b>	The <b>Medical Research Council</b> is created as a stand-alone institute, replacing the departmental committee for medical research.	<b>2014–15:</b>	The <b>National Science Challenges</b> are established. Many are relevant to health and wellbeing, in particular: A better start, Ageing well, and Healthier lives.
<b>1955:</b>	The Auckland Medical Research Foundation is established; other regional organisations followed in the 1960s.	<b>2015:</b>	A review of the HRC recommends developing New Zealand's first health research strategy, changes to the Ministerial oversight of the HRC, streamlining of HRC reporting and improvements to HRC processes.
<b>1968:</b>	The University of Auckland establishes the Auckland Medical School.	<b>2016:</b>	The Government announces the <b>largest-ever increase in New Zealand health research funding</b> of \$97 million over four years, bringing HRC funding to \$123 million in 2019/20.
<b>1987–88:</b>	The Cartwright Inquiry into cervical cancer research at National Women's Hospital is conducted.	<b>2017:</b>	Australia and New Zealand sign the Australia New Zealand Science, Research and Innovation Cooperation Agreement.
<b>1990:</b>	The <b>Health Research Council (HRC)</b> is established under the Health Research Council Act 1990. The Act broadens the HRC's scope beyond that of the Medical Research Council to include public health and Māori health research, while maintaining funding of biomedical research.		
<b>1993–94:</b>	The Privacy Act 1993 and the Health Information Privacy Code 1994 become law.		
<b>1996:</b>	The Code of Health and Disability Services Consumers' Rights and New Zealand's informed consent model are introduced.		

## Scientific breakthroughs achieved through New Zealand research

<b>1963:</b>	A New Zealand neonatologist pioneers a new treatment for fetal anaemia.	<b>2002:</b>	Neuroscientists identify stem cells in the human brain for the first time, sparking new avenues of research on how the brain renews itself.
<b>1972:</b>	Dunedin Multidisciplinary Health and Development Study is formed to link human development data with genetics. The study has since become an international resource. A key finding is that childhood maltreatment increases the risk of health problems in adulthood.	<b>2003:</b>	A device for cooling the brain of premature babies – the CoolCap – is shown to prevent brain damage after international clinical trials.
<b>1977:</b>	The Christchurch Health and Development Study begins. Its earliest breakthrough research links passive smoking to higher respiratory illness in infancy.	<b>2010:</b>	A new, non-invasive diagnostic test for bladder cancer reaches the market in New Zealand, and is soon available in Singapore and the United States.
<b>1980s:</b>	Research proving that the asthma drug fenoterol was the cause of increased asthma mortality ends the epidemic of asthma deaths in New Zealand.	<b>2010:</b>	The sugar babies study identifies the benefits of using dextrose gel on at-risk hypoglycaemic babies.
<b>1990:</b>	The New Zealand Cot Death Prevention Programme changes the way New Zealanders understand safe sleep for babies, with the result that mortality rates from sudden infant death syndrome halve within two years.	<b>2016:</b>	Computer models of physiological processes with real-time bedside clinical data to personalise diagnosis, monitoring and care reduce the number of deaths in adult intensive care patients. To date, this research has saved approximately 300 lives and at least \$5 million in health care costs in Christchurch alone.
<b>1995:</b>	A powerful new test to detect heart failure is developed. A 2006 meta-analysis of 10 studies worldwide showed that the test reduced mortality in 35% of patients under 75 years of age.		



## Changing context

Health research occurs within a rapidly changing context.

- **Scientific and technological breakthroughs**, such as genomics and big data, are changing the nature of health research and the delivery of care.
- **Competition is growing globally** for health researchers and health practitioners who are internationally mobile.
- **International collaborations** are increasingly necessary for producing excellent research. Part of the reason for this need is that science, health, social and environmental challenges are growing in complexity.
- **New, emerging and increasing threats** to human health, such as climate change, infectious diseases, antimicrobial resistance and mental health, are demanding more from health research.
- **New Zealand's demographic is changing** (ageing population, more ethnically diverse population), which is placing greater and new demands on the health system.
- **New innovations and technologies** are increasing public expectations, which in turn are increasing cost pressures on the health system.
- The health system has many **conflicting demands for funding**, and it must rise to the challenge of achieving better outcomes for everyone within the resources it has.

## New Zealand's strengths and weaknesses

The literature review, data analysis and consultation identified the following strengths and areas for improvement for health research in New Zealand.

### Current strengths

1. New Zealand has many **scientific strengths** in health research. For example, from 2011–2015 field-weighted citation impact for New Zealand publications in medicine was 1.72, which is significantly above the Organisation for Economic Co-operation and Development (OECD) average of 1.23; and publications in health professions was 1.34 compared with an OECD average of 1.16.<sup>7</sup>
2. Health research has led to significant **domestic impacts**, such as:
  - a. new policies to improve housing
  - b. new interventions to reduce smoking and the effects of passive smoking
  - c. prevention of lung disease in newborns
  - d. improved treatments of osteoporosis.
3. Health researchers have made significant **international contributions**. For example, our scientists identified stem cells in the human brain for the first time and discovered the cause of a rare kidney cancer in children (Wilm's tumour).
4. New Zealand has developed a **strong Māori health research** sector that is widely noted internationally as a leading example of indigenous research.
5. New Zealand has sustained several **world-leading longitudinal studies** that have identified associations between health, social, genetic, economic, justice and education factors. Examples are the Dunedin Multidisciplinary Health and Development Study, Pacific Islands Families Study, and the Life and Living in Advanced Age Cohort Study.

### Current weaknesses

1. The health research system has limited **strategic oversight** so has mixed signals and incentives.
2. Health research in New Zealand has not always had a **clear direction for addressing the health issues and needs of New Zealanders** and achieving health equity.
3. The spread of funding between basic, clinical, applied and translational research **lacks balance**.
4. The system does **not translate** many research findings or take them up in policy and practice, and responsibilities for doing so are unclear.
5. There are significant opportunities to **engage the health system** more strongly in research and to address cultural, institutional and financial barriers.
6. **Maintaining collaboration** and cooperation between academia, the health system, communities and industry remains challenging.
7. **Private sector investment in research and development (R&D) is relatively low** and New Zealand has few independent health research organisations compared with many other OECD countries.
8. New Zealand has a growing but **small philanthropic sector** compared with other OECD countries. Examples of those who support health research are: Cure Kids, which committed over \$2 million to 16 new research projects in New Zealand in 2015; the Cancer Society, which spent more than \$1.8 million on research grants in 2016; and the Neurological Foundation of New Zealand, which invests more than \$2.5 million in neurological research every year.

### Current strengths

6. New Zealand has a **strong data infrastructure**. For example, a unique identifier for every person using health and disability support services (National Health Index number) is widely used, ethnicity data is increasingly robust, and much health data has been integrated with Statistics New Zealand's data infrastructure.
7. New Zealand's use of **health information technology** is among the highest in the world. For example, 99 percent of pharmacies are computerised and New Zealand has used electronic medical systems for over 20 years.
8. New Zealand has an **efficient ethics process** for clinical trials. For example, it has one of the fastest ethics approval processes in the OECD.

### Current weaknesses

9. Some research areas have **limited capacities and investment**, including in mental health, health systems and delivery, implementation and behavioural research, disability research and health economics.
10. **Evaluation** of interventions and research to inform quality improvement and patient safety is limited.
11. Investments have been made in developing **Pacific health research**, but this is still an emerging area. **Asian health** has had limited investment, even though the diverse Asian population is the fastest growing ethnic group in New Zealand.
12. New Zealand's **ethics review system** was set up to focus on clinical trials, but for other types of studies the user is responsible for applying to the appropriate committee.
13. **Not all clinical trials are regulated:** medical devices, gene technologies and new uses of medicines are not subject to regulatory approval.
14. Much information on health research and findings is **difficult to access and discover**.

## Appendix C: Key terms

Sources of definitions are noted in square brackets. Several definitions include minor adaptations.

<b>Biomedical research:</b>	research with the goal of understanding normal and abnormal human functioning, at the molecular, cellular, organ system and whole body levels. It includes developing tools and techniques to be applied for this purpose; and developing new therapies or devices that improve health or the quality of life of individuals, up to the point where they are tested on human subjects. Studies on human subjects that do not have a diagnostic or therapeutic orientation. [Canadian Institutes of Health Research]
<b>Clearinghouse:</b>	a central agency that collects, classifies and distributes information.
<b>Clinical research:</b>	research with the goals of improving the diagnosis and treatment (including rehabilitation and palliation) of disease and injury; and improving the health and quality of life of individuals as they pass through normal life stages. Research on, or for the treatment of, patients. [Canadian Institutes of Health Research]
<b>Clinical trial:</b>	any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes. Interventions include but are not restricted to drugs, cells and other biological products, surgical procedures, radiological procedures, devices, behavioural treatments, process-of-care changes, preventive care, etc. [World Health Organization]
<b>Consumer:</b>	a user of the health system.
<b>Dissemination:</b>	identifying the appropriate audience and tailoring the message and medium to the audience. It includes summaries for and briefings to stakeholders, educational sessions with patients, practitioners and/or policy makers, engaging knowledge users in developing and executing dissemination/implementation plan, tools creation and media engagement. [Canadian Institutes of Health Research]



<b>Evaluation:</b>	an assessment, conducted as systematically and impartially as possible, of an activity, project, programme, strategy, policy, topic, theme, sector, operational area or institutional performance. The purposes of evaluation are to promote accountability and learning. [United Nations Evaluation Group Norms and Standards for Evaluation]
<b>Genomics:</b>	the study of genes and their functions, and related techniques. Genetics scrutinises the functioning and composition of the single gene whereas genomics addresses all genes and their inter-relationships in order to identify their combined influence on the growth and development of the organism. [World Health Organization]
<b>Health:</b>	a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. [World Health Organization]
<b>Health research:</b>	research that has or may have relevance to human health. [Health Research Council Act 1990]
<b>Health services research:</b>	research with the goal of improving the efficiency and effectiveness of health professionals and the health care system through changing practice and policy. This multidisciplinary field of scientific investigation studies how social factors, financing systems, organisational structures and processes, health technologies, and personal behaviours affect access to health care, the quality and cost of health care and, ultimately, health and wellbeing. [Canadian Institutes of Health Research]
<b>Impact:</b>	the direct and indirect 'influence' of research or its effect on an individual, a community, or society as a whole, including benefits to our economic, social, human and natural capital. [National Statement of Science Investment]

<b>Innovation:</b>	the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. [OECD Oslo Manual]
<b>Kaupapa Māori research:</b>	an approach especially for researchers who are undertaking research with Māori. Kaupapa Māori research is based on the following principles: self-determination, cultural aspiration, culturally preferred pedagogy, socioeconomic mediation, extended family structure, collective philosophy, the Treaty of Waitangi and growing respectful relationships. [Rangahau]
<b>Knowledge translation:</b>	a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of people, provide more effective health services and products and strengthen the health care system. [Canadian Institutes of Health Research]
<b>Māori health research:</b>	research that creates knowledge essential for improving the health of Māori and creating healthy Māori communities. Māori approaches and knowledge can also inform improvements to the health of all populations. Māori health research can also encompass Māori research methodologies such as kaupapa Māori research. [Ministry of Health and MBIE]
<b>Mission-led science:</b>	science that works to achieve a particular policy aim or goal. The intended goal may be broadly or narrowly defined but is often identified by the funding agency – sometimes in partnership with research providers. [National Statement of Science Investment]

<b>Pacific health research:</b>	research that creates knowledge essential for improving the health of Pacific peoples and creating health Pacific communities. It encompasses Pacific research frameworks, such as fonofale, which is based on elements of a Samoan fale (thatched house). These research frameworks bring Pacific life and cultural dimensions to the research. [Health Research Council 'Pacific Health Research Guidelines' May 2014.]
<b>Public health research</b>	research aimed at improving the health of a population, or of defined sub-populations, through a better understanding of the ways in which social, cultural, environmental, occupational and economic factors determine health status. Note that population health and public health are often used interchangeably. [Canadian Institutes of Health Research Impact Measurement Framework]
<b>Quality improvement:</b>	data-driven, systematic approach by individuals who work together to improve specific internal systems, processes, costs, productivity and quality outcomes within an organisation. Quality improvement incorporates new knowledge into process improvement activities. [Shirey et al 2011]
<b>Research and development (R&amp;D):</b>	creative and systematic work to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. An R&D activity must meet five criteria: (1) be aimed at new findings, ie, novel; (2) based on original concepts and hypotheses, ie, creative; (3) be uncertain about the final outcome, ie, uncertain; (4) be planned and budgeted, ie, systematic; (5) lead to results that could be possibly reproduced, ie, transferable and/or reproducible [OECD Frascati Manual]. All R&D activities are innovation activities, but not all innovation activities are R&D activities.
<b>Research and innovation system:</b>	system that generates, disseminates and uses research and innovation.

<b>Research excellence:</b>	well-designed, well-performed, well-reported research, which is recognised as such, for example through peer review. [National Statement of Science Investment]
<b>Translation:</b>	the process of turning observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public – from diagnostics and therapeutics to medical procedures and behavioural changes. [National Institutes of Health National Center for Advancing Translational Sciences]
<b>Translational science:</b>	the field of investigation focused on understanding the scientific and operational principles underlying each step of the translational process. [National Institutes of Health National Center for Advancing Translational Sciences]

## End notes

1. [www.health.govt.nz/our-work/populations/maori-health/he-korowai-oranga](http://www.health.govt.nz/our-work/populations/maori-health/he-korowai-oranga)
2. [www.mbie.govt.nz/info-services/science-innovation/pdf-library/vm-booklet.pdf](http://www.mbie.govt.nz/info-services/science-innovation/pdf-library/vm-booklet.pdf)
3. [www.health.govt.nz/system/files/documents/publications/nz-health-research-strategy-2017-2027-summary-submissions-feb17.pdf](http://www.health.govt.nz/system/files/documents/publications/nz-health-research-strategy-2017-2027-summary-submissions-feb17.pdf)
4. Refer to list of references.
5. [www.mbie.govt.nz/about/whats-happening/news/document-image-library/hrc-strategic-refresh-final-report.pdf](http://www.mbie.govt.nz/about/whats-happening/news/document-image-library/hrc-strategic-refresh-final-report.pdf)
6. <https://www.health.govt.nz/system/files/documents/publications/ala-moui-pathways-to-pacific-health-and-wellbeing-2014-2018-jun14-v2.pdf>
7. Retrieved from SciVal 21 November 2016.

## References

- ACC. 2015. *Annual Report 2015*. Wellington: Accident Compensation Corporation.
- Access Economics. 2003. *Exceptional Returns: The value of investing in health R&D in Australia*. Prepared for the Australian Society for Medical Research.
- Adam P, Solans-Domènech M, Pons J, et al. 2012. Assessment of the impact of a clinical and health services research call in Catalonia. *Research Evaluation* 21(4): 319–28.
- Agranoff R, McGuire M. 2004. *Collaborative Public Management*. American Governance and Public Policy Series.
- AHMAC. 2015. *Expert Opinion Paper: Implementing clinical genomics in Australia*. Prepared by the Western Australian Department of Health for the Hospitals Principal Committee of the Australian Health.
- Ahmed MZ. 2016. Opinion: The postdoc crisis. *New Scientist*. URL: [www.the-scientist.com/?articles.view/articleNo/44874/title/Opinion--The-Postdoc-Crisis](http://www.the-scientist.com/?articles.view/articleNo/44874/title/Opinion--The-Postdoc-Crisis).
- Anderson I, Robson B, Connolly M, et al. 2016. Indigenous and tribal peoples' health (The Lancet–Lowitja Institute Global Collaboration): a population study. *Lancet* 388(10040): 131–57. DOI: [http://dx.doi.org/10.1016/S0140-6736\(16\)00345-7](http://dx.doi.org/10.1016/S0140-6736(16)00345-7).
- Anderson P, King J, Moss M, et al. 2016. Nurse-led school based clinics for rheumatic fever prevention and skin infection management: Evaluation of Mana Kidz programme in Counties-Manukau. *New Zealand Medical Journal* 129(1428). URL: [www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2016/vol-129-no-1428-8-january-2016/6782](http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2016/vol-129-no-1428-8-january-2016/6782).
- Arizona Health Sciences Centre. 2010. A Strategic Planning Framework for 2020, p 9 (adapted from National Cancer Institute, *Translating Research into Cancer Care: Delivering on the promise: 2004–2005*). URL: <http://opa.ahsc.arizona.edu/sites/opa.ahsc.arizona.edu/files/uploads/Strategic%20Overview%20FINAL%205.pdf>.
- Atkinson J, Salmond C, Crampton P. 2014. *NZDep 2013 Index of Deprivation*. Dunedin: University of Otago. URL: <http://www.otago.ac.nz/wellington/otago069936.pdf>.
- Australian Medical Research Advisory Board. 2016. *Australian Medical Research and Innovation Strategy 2016–2021*. URL: [https://health.gov.au/internet/main/publishing.nsf/Content/mrff/\\$FILE/Australian%20Medical%20Research%20and%20Innovation%20Strategy%202016.pdf](https://health.gov.au/internet/main/publishing.nsf/Content/mrff/$FILE/Australian%20Medical%20Research%20and%20Innovation%20Strategy%202016.pdf).
- Australian Research Council. 2016. *Engagement and Impact Assessment – Consultation Paper*. Canberra: Department of Education and Training.
- Australian Technology Network. 2012. *Excellence in Innovation Research: Impacting our nation's future – assessing the benefits*. Australian Technology Network of Universities.
- Baker MG, McDonald A, Zhang J, et al. 2013. *Infectious Diseases Attributable to Household Crowding in New Zealand: A systematic review and burden of disease estimate*. Wellington: He Kainga Oranga/ Housing and Health Research Programme, University of Otago.
- Barwick H. 2000. *Improving Access to Health Care for Māori and Pacific Peoples: A literature review commissioned by the Health Funding Authority*. URL: [www.hauora.co.nz/improving-access-to-PC-for-Maori-and-Pacific.pdf](http://www.hauora.co.nz/improving-access-to-PC-for-Maori-and-Pacific.pdf).
- Batalden P, Foster T (eds). 2012. *Sustainably Improving Healthcare: Creating linking care outcomes, system performance and professional development*. Radcliffe Publishing.
- Beaton A, Smith B, Toki V, et al. 2015. Engaging Māori in biobanking and genetic research: legal, ethical, and policy challenges. *International Indigenous Policy Journal* 6(3). URL: <http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1211&context=iipj>.
- Blume-Kohout M, Adhikari D. 2016. Training the Scientific Workforce: Does funding mechanism matter? *Research Policy*. 45(6): 1291–1303.
- Bluxton M. 2004. Estimating the economic value to societies of the impact of health research: a critical review. *Bulletin of the World Health Organization* 82(10): 733–9.
- Buykx P, Humphreys J, Wakerman J, et al. 2012. Making evidence count: a framework to monitor the impact of health services research. *Australian Journal of Rural Health* 20(2): 51–8.
- Caddell AJ, Hatchette JE, McGrath PJ. 2010. Examining the impact of health research facilitated by small peer-reviewed research operating grants in a women's and children's health centre. *BMC Research Notes* 3: 107–11.

- Cameron A, Lart R, Bostock L, et al. 2013. Factors that promote and hinder joint and integrated working between health and social care services: a review of research literature. *Health and Social Care in the Community*. URL: <http://onlinelibrary.wiley.com/doi/10.1111/hsc.12057/full>.
- Cammock RD, Derrett S, Davie G, et al. 2012. Injury to Pacific people in New Zealand: pre-injury characteristics and early health outcomes – results from a cohort study. *Australasian Epidemiologist* 19(2): 17–21.
- Canadian Institutes of Health Research. 2005. *Developing a CIHR Framework to Measure the Impact of Health Research: Synthesis Report of Meetings February 23, 24, and May 18, 2005: A Framework for Measuring the Impact of Health Research*. Ottawa: CIHR. URL: <http://publications.gc.ca/collections/Collection/MR21-65-2005E.pdf>.
- Canadian Institutes of Health Research. 2013. *Celebrating the Impact of Health Research: Success stories in arthritis, bone, muscle, musculoskeletal rehabilitation, oral health and skin*. Montreal: CIHR Institute of Musculoskeletal Health and Arthritis Canadian Arthritis Network.
- Canadian Institutes of Health Research. 2014. *Pan-Canadian Vision and Strategy for Health Services and Policy Research 2014–2019*. Montreal: Canadian Institutes of Health Research, Institute of Health Services and Policy Research.
- Canadian Institutes of Health Research. 2015. Health Research Roadmap II: Strategic Plan 2014/15–2018/19. Research Priority B Health and Wellness For Aboriginal Peoples. URL: [www.cihr-irsc.gc.ca/e/48964.html](http://www.cihr-irsc.gc.ca/e/48964.html).
- Canterbury DHB. 2015. *Snapshot of How We're Doing: Canterbury health system quality accounts 2014–15*. Christchurch: Canterbury District Health Board. URL: [www.cdhb.health.nz/About-CDHB/corporate-publications/Documents/CDHB-Quality-Accounts-2015-Final.pdf](http://www.cdhb.health.nz/About-CDHB/corporate-publications/Documents/CDHB-Quality-Accounts-2015-Final.pdf).
- Chalmers I, Bracken MB, Djulbegovic B, et al. 2014. How to increase value and reduce waste when research priorities are set. *Lancet* 383(9912): 156–165. (Part of the Lancet series Research: increasing value, reducing waste.)
- Clancy CM, Glied SA, Lurie N. 2012. From research to health policy impact. *Health Services Research* 47(1/2): 337–43.
- Claxton K, Griffin S, Koffijberg H, et al. 2013. *Expected Health Benefits of Additional Evidence: Principles, methods and applications*. CHE Research Paper 83, Centre for Health Economics, University of York. URL: [www.york.ac.uk/media/che/documents/papers/researchpapers/CHERP83\\_health\\_benefits\\_additional\\_evidence\\_PCORI.pdf](http://www.york.ac.uk/media/che/documents/papers/researchpapers/CHERP83_health_benefits_additional_evidence_PCORI.pdf).
- Cleary M, Siegfried N, Jackson D, et al. 2013. Making a difference with research: measuring the impact of mental health research. *International Journal of Mental Health Nursing* 22(2): 103–5.
- Clinical Trials Action Group. 2011. *Clinically Competitive: Boosting the business of clinical trials in Australia*. Canberra: Commonwealth of Australia. URL: [https://industry.gov.au/industry/IndustrySectors/PharmaceuticalsandHealthTechnologies/ClinicalTrialsActionGroup/Documents/Clinical\\_Trials\\_Action\\_Group\\_Report.pdf](https://industry.gov.au/industry/IndustrySectors/PharmaceuticalsandHealthTechnologies/ClinicalTrialsActionGroup/Documents/Clinical_Trials_Action_Group_Report.pdf).
- Cooksey, D. 2006. *A review of UK health research funding*. Norwich: The Stationery Office. URL: <https://pdfs.semanticscholar.org/e77a/c86d92aebc8f3c92f945ba1d9a17ccc2456a.pdf>.
- Craig E, Jackson C, Han D, et al. 2007. *Monitoring the Health of New Zealand Children and Young People: Indicator handbook*. Auckland: Paediatric Society of New Zealand, New Zealand Child and Youth Epidemiology Service. URL: [www.paediatrics.org.nz/files/Indicator%20Handbook%20Version%2008.3.pdf](http://www.paediatrics.org.nz/files/Indicator%20Handbook%20Version%2008.3.pdf).
- Cutler D, Kadiyala S. 1999. *The Economics of Better Health: The case of cardiovascular disease*. New York: The Lasker Foundation.
- Darzi Lord, Parston G. 2013. *Global Diffusion of Healthcare Innovation (GDHI). Report on the Global Department of Health and Ageing. Strategic Review of Health and Medical Research*. Canberra: Department of Health and Ageing.
- Darzi Lord, Parston G, McQueen J. 2015. *Global Diffusion of Healthcare Innovation: Accelerating the Journey*, Report of the Global Diffusion of Healthcare Innovation Working Group, Imperial College, London.
- Denegri S (Review Chair). nd. *Going the extra mile: Improving the nation's health and wellbeing through public involvement in research, The final report and recommendations to the Director General Research and Development/Chief Medical Officer Department of Health of the 'Breaking Boundaries' strategic review of public involvement in the National Institute for Health Research (NIHR)*. URL: <https://www.nihr.ac.uk/about-us/documents/Extra%20Mile2.pdf>.
- Department of Health. 2006. *Best Research for Best Health: A new national health research strategy*. London: Department of Health. URL: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/568772/dh\\_4127152\\_v2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/568772/dh_4127152_v2.pdf).
- Donovan C, Hanney S. 2011. 'The Payback Framework' explained. *Research Evaluation* 20(3): 181–3.
- Dormer R. 2014. Whānau ora and the collaborative turn. *International Journal of Public Administration* 37: 835–45.

- EnergyScape. 2009. *Research Prioritisation Tool Development*. Prepared for the Foundation for Research, Science and Technology (FRST) by R de Vos and S Fortuin of NIWA. URL: [www.niwa.co.nz/sites/niwa.co.nz/files/imported/\\_data/assets/pdf\\_file/0006/95748/Research-Prioritisation-Tool-Development\\_D.pdf](http://www.niwa.co.nz/sites/niwa.co.nz/files/imported/_data/assets/pdf_file/0006/95748/Research-Prioritisation-Tool-Development_D.pdf).
- European Commission. 2013. Use of ‘-omics’ Technologies in the Development of Personalised Medicine. Working document, SWD (2013) 436. Brussels: European Commission. URL: [http://ec.europa.eu/research/health/pdf/2013-10\\_personalised\\_medicine\\_en.pdf#view=fit&pagemode=none](http://ec.europa.eu/research/health/pdf/2013-10_personalised_medicine_en.pdf#view=fit&pagemode=none).
- European Science Foundation. 2015. *Career Tracking of Doctorate Holders. Pilot project report*. Strasbourg, France. URL: [www.esf.org/fileadmin/user\\_upload/esf/Career\\_Tracking\\_Pilot\\_Report\\_2015-05-28.pdf](http://www.esf.org/fileadmin/user_upload/esf/Career_Tracking_Pilot_Report_2015-05-28.pdf).
- Frank C, Nason E. 2009. Health research: measuring the social, health and economic benefits. *Canadian Medical Association Journal* 180(5): 528–34.
- Frewer LJ, Shepherd R. 1995. Ethical concerns and risk perceptions associated with different applications of genetic engineering: Interrelationships with the perceived need for regulation of the technology. *Agriculture and Human Values* 12(1): 48–57. URL: <http://link.springer.com/article/10.1007/BF02218074>.
- Fulda KG, Lykens K. 2016. Ethical issues in predictive genetic testing: a public health perspective. *Journal of Medical Ethics* 32(3): 142–7. URL: [www.ncbi.nlm.nih.gov/pmc/articles/PMC2564466](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2564466).
- Funding First. 2000. *Exceptional Returns: The economic value of America’s investment in medical research*. New York (NY): The Lasker Foundation.
- Garrett-Jones S, Turpin T, Wixted B. 2004. *Science for Life: An evaluation of New Zealand’s Health Research Investment System based on International Benchmarks*. Produced by AEGIS and University of Sydney for MoRST.
- Garcia-Romero A, Escribano A, Tribo J. 2017. The Impact of Health Research on Length of Stay in Spanish Public Hospitals. *Research Policy*. 46(3): 591-604.
- Gerdeman D, Nobel C. 2016. Crowdsourcing, patent trolls, and other research insights highlighted at Harvard Business School Symposium. URL: <http://hbswk.hbs.edu/item/crowdsourcing-patent-trolls-and-other-research-insights-highlighted-at-harvard-business-school-symposium>.
- Government of Alberta. 2010. *Alberta’s Health Research and Innovation Strategy 2010–2020*. Government of Alberta. URL: [http://uat.economic.alberta.ca/documents/ahris\\_report\\_aug2010.pdf?0.653810755815357](http://uat.economic.alberta.ca/documents/ahris_report_aug2010.pdf?0.653810755815357).
- Graham KER, Chorzempa HL, Valentine PA, et al. 2012. Evaluating health research impact: Development and implementation of the Alberta Innovates – Health Solutions Impact Framework. *Research Evaluation* 21(5): 345–67.
- Gullery C, Hamilton G. 2015. Towards integrated person-centred healthcare – the Canterbury journey. *Future Hospital Journal* 2(2).
- Haeussler C, Sauermann H. 2016. The division of labour in teams: a conceptual framework and application to collaborations in science. National Bureau of Economic Research, Working Paper 22241, Cambridge, MA.
- Hanney S, Kuruvilla S, Soper B, et al. 2010. Who needs what from a national health research system: lessons from reforms to the English Department of Health’s R&D system. *Health Research Policy and Systems* 8(11). URL: <https://health-policy-systems.biomedcentral.com/articles/10.1186/1478-4505-8-11>.
- Health Economics Research Group. 2008. *Medical Research: What’s it worth? Estimating the economic benefits from medical research in the UK*. Health Economics Research Group, RAND Europe.
- Health Research Board. 2005. *Health Research – Making an Impact: The economic and social benefits of HRB-funded research*. Ireland: Health Research Board.
- Health Research Council. 2011. Sharing research data to improve public health: a joint statement by funders of health research. *Ethics Notes* May. URL: [www.hrc.govt.nz/sites/default/files/Ethics-May2011.pdf](http://www.hrc.govt.nz/sites/default/files/Ethics-May2011.pdf).
- Health Research Council. 2015a. *Annual Report 2015: Report of the Health Council of New Zealand for the year ended 30 June 2015*. URL: [www.hrc.govt.nz/sites/default/files/Annual%20Report%202015%20-%20FINAL%20for%20print.pdf](http://www.hrc.govt.nz/sites/default/files/Annual%20Report%202015%20-%20FINAL%20for%20print.pdf).
- Health Research Council. 2015b. Media release: \$8.2m for emerging health researchers. URL: [www.hrc.govt.nz/news-and-media/media/82m-emerging-health-researchers](http://www.hrc.govt.nz/news-and-media/media/82m-emerging-health-researchers).
- Health Research Council. 2015c. *Research to Action: Improving the lives of New Zealanders through health research, HRC Investment Impact Report for the Ministry of Business, Innovation and Employment*. Auckland: Health Research Council of New Zealand. URL: <http://www.hrc.govt.nz/sites/default/files/Research%20to%20Action%20-%20HRC%20IIR%202015.pdf>.

- Helu S, Robinson E, Grant S, et al. 2009. *Youth '07 The health and wellbeing of secondary school students in New Zealand: Results for Pacific young people*. Auckland: The University of Auckland. URL: <https://www.fmhs.auckland.ac.nz/assets/fmhs/faculty/ahrg/docs/2007-pacific-report-tables.pdf>.
- Hickie IB, Christensen H, Davenport TA, et al. 2005. Can we track the impact of Australian mental health research? *Australian and New Zealand Journal of Psychiatry* 39(7): 591–9.
- High and Complex Needs Unit. 2007. *Better at Working Together: Interagency Collaboration. Part I: Literature review*. Wellington: High and Complex Needs Unit. URL: <http://navnetnl.ca/wp-content/uploads/2010/10/better-at-working-together-part-1-literature-review.pdf>.
- Howard D, Brophy R, Howell S. 2013. Evidence of no benefit from knee surgery for osteoarthritis led to coverage changes and is linked to decline in procedures. *Health Affairs* 31(10): 2242–9.
- James JE. 2015. *The Health of Populations: Beyond medicine* (1st edn). Elsevier.
- Joint Economic Committee. 2000. *The Benefits of Medical Research and the Role of the NIH*. Washington, DC: US Senate. URL: [http://www.faseb.org/portals/2/pdfs/opa/2008/nih\\_research\\_benefits.pdf](http://www.faseb.org/portals/2/pdfs/opa/2008/nih_research_benefits.pdf).
- Kansagra SM, Farley TA. 2011. Public health research: lost in translation or speaking the wrong language? *American Journal of Public Health* 101(12): 2203–6.
- Kuruville S, Mays N, Walt G. 2007. Describing the impact of health services and policy research. *Journal of Health Services and Policy* 1: 23–31.
- Lancet Commission on Investing in Health. 2013. Global Health 2035: A world converging within a generation. *Lancet* 382(9908): 1898–955. URL: [www.thelancet.com/commissions/global-health-2035](http://www.thelancet.com/commissions/global-health-2035).
- Lavis J, Ross S, McLeod C, et al. 2003. Measuring the impact of health research. *Journal of Health Services, Research and Policy* 8(3): 165–70.
- Lips A, Miriam B, O'Neill R, et al. 2011. Cross-agency collaboration in New Zealand: an empirical study of information sharing practices, enablers and barriers in managing for shared social outcomes. *International Journal of Public Administration* 34(4): 255–66. URL: [www.victoria.ac.nz/sog/researchcentres/egovt/publications/cross-Agency\\_collaboration.pdf](http://www.victoria.ac.nz/sog/researchcentres/egovt/publications/cross-Agency_collaboration.pdf).
- Lomas J. 2007. *Formalised Informality: An action plan to spread health innovations*. Wellington: Ministry of Health.
- McCool J, Bullen C. 2011. Punching above its weight: why New Zealand must maintain leadership in global health in the Pacific. *New Zealand Medical Journal* 124(1345).
- McGregor S, Henderson K, Kaldor J. 2014. How are health research priorities set in low and middle income countries? A systematic review of published reports. *PLoS ONE* 9(10): 1–9.
- McKeon S (Panel Chair). 2013. *Better Health through Research: Strategic review of health and medical research*. Canberra: Department of Health and Ageing, Commonwealth of Australia.
- Makenenbach J, Karanikolos M, McKee M. 2013. The unequal health of Europeans: successes and failures of policies. *Lancet* 381: 1125–34.
- Marmot Review. 2010. *Fair Society, Healthy Lives: A strategic review of health inequalities in England post 2010*. London: University College London.
- Milat AJ, Laws R, King L, et al. 2013. Policy and practice impacts of applied research: a case study analysis of the New South Wales Health Promotion Demonstration Research Grants Scheme 2000–2006. *Health Research Policy and Systems* 11(1): 1–15.
- Milat AJ, King A, Newson R, et al. 2014. Increasing the scale and adoption of population health interventions: experiences and perspectives of policy makers, practitioners, and researchers. *Health Research Policy and Systems* 12(18). URL: <https://health-policy-systems.biomedcentral.com/articles/10.1186/1478-4505-12-18>.
- Miller F, French M. 2016. Organizing the Entrepreneurial Hospital: Hybridizing the logics of healthcare and innovation. *Research Policy*. 45(8): 1534–1544.
- Ministry of Business, Innovation and Employment. 2015. *National Statement of Science Investment 2015–2025*. Wellington: Ministry of Business, Innovation and Employment. URL: <http://www.mbie.govt.nz/info-services/science-innovation/pdf-library/NSSI%20Final%20Document%202015.pdf>.
- Ministry of Business, Innovation and Employment, Ministry of Health. 2015. Strategic Refresh of the Health Research Council: *Report to the Minister of Health and the Minister of Science and Innovation*. URL: [www.hrc.govt.nz/sites/default/files/HRC%20refresh%20report\\_o.pdf](http://www.hrc.govt.nz/sites/default/files/HRC%20refresh%20report_o.pdf).



- Ministry of Business, Innovation and Employment, Ministry of Health. 2017. *New Zealand Health Research Strategy 2017–2027: Summary of submissions and consultation*. Wellington: Ministry of Health. URL: <http://www.health.govt.nz/publication/new-zealand-health-research-strategy-2017-2027-summary-submissions-and-consultation>.
- Ministry of Health. 1998. *Child Health Strategy 1998*. Wellington: Ministry of Health.
- Ministry of Health. 2007. *Overview of the Evaluation of the Eleven Primary Health Care Nursing Innovation Projects*. Wellington: Ministry of Health.
- Ministry of Health. 2013a. *Health of Māori Adults and Children: Key findings from the New Zealand Health Survey*. Wellington: Ministry of Health.
- Ministry of Health. 2013b. *New Zealand Framework for Dementia Care*. Wellington: Ministry of Health.
- Ministry of Health. 2014. *'Ala Mo'ui: Pathways to Pacific Health and Wellbeing 2014–2018*. Wellington: Ministry of Health. URL: <https://www.health.govt.nz/system/files/documents/publications/ala-moui-pathways-to-pacific-health-and-wellbeing-2014-2018-jun14-v2.pdf>.
- Ministry of Health. 2015a. *Annual Update of Key Results 2014/15: New Zealand Health Survey*. Wellington: Ministry of Health.
- Ministry of Health. 2015b. *Health and Independence Report*. Wellington: Ministry of Health.
- Ministry of Health. 2015c. *Tatau Kahukura: Māori Health Chart Book 2015* (3rd edn). Wellington: Ministry of Health.
- Ministry of Health. 2016a. *Health of the Health Workforce 2015*. Wellington: Health Workforce New Zealand.
- Ministry of Health. 2016b. *New Zealand Health Strategy: Roadmap of actions 2016*. Wellington: Ministry of Health. URL: [www.health.govt.nz/new-zealand-health-system/new-zealand-health-strategy-roadmap-actions-2016](http://www.health.govt.nz/new-zealand-health-system/new-zealand-health-strategy-roadmap-actions-2016).
- Ministry of Health, Accident Compensation Corporation. 2013. *Injury-Related Health Loss: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study 2001–2016*. Wellington: Ministry of Health.
- Ministry of Research, Science and Technology. 2007a. *Health Research Council Evaluation 2007*. Price Waterhouse Coopers.
- Ministry of Research, Science and Technology. 2007b. *Vision Mātauranga: Unlocking the innovation potential of Māori knowledge, resources and people*. Wellington: Ministry of Research, Science and Technology. URL: <http://www.mbie.govt.nz/info-services/science-innovation/pdf-library/vm-booklet.pdf>.
- Ministry of Research, Science and Technology. 2009. *Health Delivery Research Landscape: An overview of New Zealand research capability focused on health delivery*. Wellington: Ministry of Research, Science and Technology.
- Morens D, Fauci A. 2013. Emerging infectious diseases: threats to human health and global stability. *PLoS Pathogens* 9(7): e1003467. URL: [www.ncbi.nlm.nih.gov/pmc/articles/PMC3701702](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3701702).
- National Institute for Health Research. nd. *NIHR Annual Report 2015/16*. URL: <https://www.nihr.ac.uk/about-us/documents/NIHR-Annual-Report-2015-16.pdf>.
- National Institute for Health Research. 2015. *Growth through Health Research: The NIHR as an engine of growth*. London: NIHR Office for Clinical Research Infrastructure (NOCRI). URL: [https://www.nihr.ac.uk/life-sciences-industry/documents/Brochures%20and%20flyers/The\\_NIHR\\_as\\_an\\_engine\\_for\\_growth.pdf](https://www.nihr.ac.uk/life-sciences-industry/documents/Brochures%20and%20flyers/The_NIHR_as_an_engine_for_growth.pdf).
- National Research Council of National Academics. 2011. *Towards Precision Medicine: Building a knowledge network for biomedical research and a new taxonomy of disease*. Washington DC: National Academies Press. URL: [www.plengegen.com/wp-content/uploads/4\\_Toward-Precision-Medicine.pdf](http://www.plengegen.com/wp-content/uploads/4_Toward-Precision-Medicine.pdf).
- NHC. 2015. *The Introduction of Fit for-purpose Omics-based Technologies: Think piece*. Wellington: National Health Committee. URL: [www.health.govt.nz/system/files/documents/publications/nhc-think-piece-introduction-fit-for-purpose-omics-based-technologies.pdf](http://www.health.govt.nz/system/files/documents/publications/nhc-think-piece-introduction-fit-for-purpose-omics-based-technologies.pdf).
- OECD. 2001. *Measuring Expenditure in Health-related R&D*. Paris: Organisation for Economic Cooperation and Development.
- OECD. 2004. *Towards High-performing Health Systems: Summary report*. Paris: Organisation for Economic Cooperation and Development.
- OECD. 2005. *Oslo Manual: Guidelines for collecting and interpreting innovation data (3rd edn)*. Paris: Organisation for Economic Cooperation and Development.
- OECD. 2015a. *Data-driven Innovation: Big data for growth and well-being*. Paris: Organisation for Economic Cooperation and Development.

- OECD. 2015b. *Frascati Manual 2015: Guidelines for collecting and reporting data on research and experimental development*. Paris: Organisation for Economic Cooperation and Development.
- OECD. 2015c. *Public–Private Partnerships in Biomedical Research and Health Innovation for Alzheimer’s and Other Dementias*. Science, Technology and Industry Policy Papers, No.20. Paris: Organisation for Economic Cooperation and Development. DOI: <http://dx.doi.org/10.1787/5js36rc8wwbt-en>.
- OECD. 2016. *Health Workforce Policies in OECD Countries: Right jobs, right skills, right places*. OECD Health Policy Studies. URL: [www.oecd-ilibrary.org/social-issues-migration-health/health-workforce-policies-in-oecd-countries\\_9789264239517-en](http://www.oecd-ilibrary.org/social-issues-migration-health/health-workforce-policies-in-oecd-countries_9789264239517-en).
- Primary Health Care Nurse Innovation Evaluation Team. 2007. *A Report to the Ministry of Health*. Wellington: Ministry of Health.
- PWC Health Research Institute. 2014. *Health Wearables, Early Days*. Price Waterhouse Coopers.
- Regional Public Health. 2011a. *Keeping Well Implementation Plan 2011/2012*. Wellington: Regional Public Health.
- Regional Public Health. 2011b. Report produced for Keeping Well by Sarah Widmer.
- Reid I, Joyce P, Fraser J, et al. 2014. Government funding of health research in New Zealand. *New Zealand Medical Journal* (Online) 127(1389): 25–30. URL: [www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2014/vol-127-no-1389/5992](http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2014/vol-127-no-1389/5992).
- Royal Society Te Apārangī. 2017. *Antimicrobial Resistance: Implications for New Zealanders: Evidence update*, Expert advice paper. URL: <https://royalsociety.org.nz/assets/documents/Antimicrobial-resistance-factsheet-May-2017.pdf>.
- Sarewitz D. 2016. Saving science. *The New Atlantis* 49: 4–40.
- Shirey M, Hauck S, Embree J, et al. 2011. Showcasing Differences Between Quality Improvement, Evidence-Based Practice, and Research. *The Journal of Continuing Education in Nursing*. 42(2): 57–68.
- Solans-Domenech M. 2013. Impact of clinical and health services research projects on decision-making: a qualitative study. *Health Research Policy and Systems* 11(1): 1–11.
- Statistics New Zealand. 2006. *Demographic Aspects of New Zealand’s Ageing Population*. Wellington: Statistics New Zealand.
- Statistics New Zealand. 2014. *Disability Survey 2013*. URL: [http://www.stats.govt.nz/browse\\_for\\_stats/health/disabilities/DisabilitySurvey\\_HOTP2013.aspx](http://www.stats.govt.nz/browse_for_stats/health/disabilities/DisabilitySurvey_HOTP2013.aspx).
- Statistics New Zealand, Ministry of Pacific Island Affairs. 2011. *Health and Pacific Peoples in New Zealand – Pacific Progress*. Wellington: Statistics New Zealand and Ministry of Pacific Island Affairs.
- Tetroe JM, Graham I, Foy R, et al. 2008. Health research funding agencies’ support and promotion of knowledge translation: An international study. *The Milbank Quarterly* 86(1): 125–55.
- The Treasury. 2014. *Briefing to Incoming Minister: Health*. Wellington: The Treasury.
- The Treasury. 2015. *How Social Investment Works*. Wellington: The Treasury.
- Thune T, Mina A. 2016. Hospitals as innovators in the health-care system: A literature review and research agenda. *Research Policy*. 45(8): 1545-1557.
- Tomoko O, Lafortune G, Schoenstein M. 2013. *Health Workforce Planning in OECD Countries*. OECD Health Working Papers. Paris: Organisation for Economic Cooperation and Development.
- United Nations Evaluation Group. 2016. *Norms and Standards for Evaluation*. New York: UNEG. URL: <http://www.unevaluation.org/2016-Norms-and-Standards>.
- US Department of Health and Human Services. 2017. *Help Me Understand Genetics: Precision medicine*. Department of Health and Human Services. URL: <https://ghr.nlm.nih.gov/primer/precisionmedicine.pdf>.
- University of Otago. 2012. Alarming increase in serious infectious diseases in NZ. URL: [www.otago.ac.nz/news/news/otago030366.html](http://www.otago.ac.nz/news/news/otago030366.html).
- Viergever RF, Olifson S, Ghaffar A, et al. 2010. A checklist for health research priority setting: nine common themes of good practice. *Health Research Policy and Systems* 8(36).
- Walker L, Clendon J. 2012. Ageing in place: retirement intentions of New Zealand nurses aged 50+. *Labour Employment and Work in New Zealand*. URL: <http://ojs.victoria.ac.nz/LEW/article/view/1972>.

- Watt, IJ. 2015. *Review of Research Policy and Funding Arrangements*. Report to the Minister of Education and Training, Canberra.
- Western Australian Department of Health. 2015. *Implementing Clinical Genomics in Australia*. Expert Opinion Paper prepared for the Australian Health Ministers' Advisory Council Hospitals Principal Committee.
- WHO. 2008. A summary of the 2008 World Health Report 'Primary Health Care: Now More Than Ever'. Geneva: World Health Organization. URL: [www.who.int/whr/2008/summary.pdf?ua=1](http://www.who.int/whr/2008/summary.pdf?ua=1).
- WISH. 2013. *Big Data and Health Report: Revolutionizing medicine and public health*. World Innovation Summit for Health.
- Wong A. 2015. Challenges for Asian health and Asian health promotion in New Zealand. Occasional paper for the Health Promotion Forum of New Zealand.
- Yasamy MT, Dua T, Harper M, et al. 2013. Mental health of older adults, addressing a growing concern. WHO, Department of Mental Health and Substance Abuse.
- Yoshida S. 2016. Approaches, tools and methods used for setting priorities in health research in the 21st century. *Journal of Global Health* 6(1) 010507.

## Websites

- Canadian Institutes of Health Research. Glossary of Funding-Related Terms. URL: <http://www.cihr-irsc.gc.ca/e/34190.html>.
- Commonwealth Fund. Multinational Comparisons of Health Systems Data, 2014. URL: [www.commonwealthfund.org/publications/chartbooks/2014/multinational-comparisons-of-health-systems-data-2014](http://www.commonwealthfund.org/publications/chartbooks/2014/multinational-comparisons-of-health-systems-data-2014).
- INVOLVE, National Institute for Health Research. URL: <http://www.invo.org.uk>.
- Ministry of Health. He Korowai Oranga. URL: <http://www.health.govt.nz/our-work/populations/maori-health/he-korowai-oranga>.
- National Institute for Health Research. Chronology of the NIHR. URL: <https://www.nihr.ac.uk/about-us/nihr-today/chronology-of-the-nihr.htm>.
- National Institute for Health Research. NIHR Today. URL: <https://www.nihr.ac.uk/about-us/nihr-today/>.
- National Institute for Health Research. Office for Strategic Coordination of Health Research (OSCHR). URL: <https://www.nihr.ac.uk/about-us/our-purpose/national-research-context/office-for-strategic-coordination-of-health-research.htm>.
- NIH National Center for Advancing Translational Sciences. Translational Science Spectrum. URL: <https://ncats.nih.gov/translation/spectrum>.
- State Services Commission. Better Public Services 2012–2017. URL: [www.ssc.govt.nz/better-public-services](http://www.ssc.govt.nz/better-public-services).
- Statistics New Zealand. Health Expectancy NZ Progress Indicators. URL: [www.stats.govt.nz/browse\\_for\\_stats/snapshots-of-nz/nz-progress-indicators/home/social/health-expectancy.aspx](http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/nz-progress-indicators/home/social/health-expectancy.aspx).
- Statistics New Zealand. Pacific peoples. URL: [http://stats.govt.nz/browse\\_for\\_stats/people\\_and\\_communities/pacific\\_peoples](http://stats.govt.nz/browse_for_stats/people_and_communities/pacific_peoples).
- The Treasury. Social investment. URL: [www.treasury.govt.nz/statesector/socialinvestment](http://www.treasury.govt.nz/statesector/socialinvestment).
- WHO. Humanitarian Health Action, Definitions: Emergencies. URL: <http://www.who.int/hac/about/definitions/en/>.
- WHO. Media centre – Antimicrobial resistance. URL: [www.who.int/mediacentre/factsheets/fs194/en](http://www.who.int/mediacentre/factsheets/fs194/en).
- WHO. Media centre – Climate change and health. URL: [www.who.int/mediacentre/factsheets/fs266/en](http://www.who.int/mediacentre/factsheets/fs266/en).
- WHO. Primary health care. URL: [www.who.int/topics/primary\\_health\\_care/en](http://www.who.int/topics/primary_health_care/en).
- WHO. Programmes – Antimicrobial resistance. URL: [www.who.int/drugresistance/en](http://www.who.int/drugresistance/en).
- WHO. WHO definitions of genetics and genomics. URL: [www.who.int/genomics/geneticsVSgenomics/en](http://www.who.int/genomics/geneticsVSgenomics/en).
- Workforce in Action. URL: [www.workforceinaction.org.nz](http://www.workforceinaction.org.nz).

