

Health Delivery Research Landscape

An overview of New Zealand research
capability focused on health delivery

MARCH 2009



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Contents

1	Summary	5
2	Introduction	6
3	Information Sources and Definitions	7
3.1	Defining Health Delivery Research	7
4	The Strategic Context for Health Research Investment	9
4.1	Health Strategies	9
4.2	Research Strategies	10
5	Public Investment in Health Delivery Research	13
5.1	Overview of Funding Sources and Pathways	13
5.2	Investment Levels	13
5.3	Health Research Council	16
5.4	Foundation for Research, Science and Technology	22
5.5	Ministry of Health	23
5.6	Accident Compensation Corporation	23
5.7	PHARMAC	24
5.8	District Health Boards	24
5.9	Alcohol Advisory Council of New Zealand	25
5.10	Tertiary Education Commission	25
5.11	Lotteries Health Research	26
5.12	Ministry of Social Development	26
5.13	Community, NGO and Charitable Sector	26
5.14	Private Sector	27
5.15	International Public and Philanthropic Sector Funding	28
6	Research Organisations	29
6.1	Universities	29
6.2	Crown Research Institutes	33
6.3	District Health Boards	34
6.4	Primary and Community Health Sector	37
6.5	Independent Medical Research Organisations	37
6.6	Central Government Agencies	38
6.7	Private Health Research Companies	38
7	Health Delivery Research Capacity	40
7.1	Research Ethics Applications	40
7.2	Health Research Workforce	41
8	Infrastructure Support For Health Delivery Research	43

8.1 Research Skills Training and Development	43
8.2 Administration and Institutional Processes and Infrastructure	43
8.3 Ethics Approval Processes	44
8.4 Evaluation and Audit	45
8.5 Compensation Environment	45
9 Current Issues in Health Delivery Research	46
9.1 Funding and Priorities	46
9.2 Application of Research to Clinical Practice, Health Services and Policy	47
9.3 Support for Research Within DHB Services	48
9.4 Low Priority/Capacity Research Areas With High Potential Gain	48
9.5 Place of Research in Improving Services and Practice	49
9.6 Commercial Application of Health Innovation Research	49
Annex 1: List of People Interviewed	50
Annex 2: Notes on Methodology and Classification of Health Delivery Research	51
Glossary	58

1 Summary

All health research plays a role, directly or indirectly, in supporting improvements and innovation in health services. Health delivery research can be identified as that sub-set of health research with a primary objective of directly improving people's health through the application of knowledge and/or improving the effectiveness and efficiency of health and disability services.

The amount and nature of health delivery research in New Zealand is currently poorly understood. This landscape report addresses this gap. It compiles information from a range of existing sources and includes an analysis of Health Research Council (HRC) funding contract data. Key findings are that:

- Total health delivery research for 2007/08 is estimated at \$38 million, around 27% of total health-related R&D funded by government. This estimate should be regarded as indicative only and is likely to be an underestimate.
- The HRC funds around two-thirds of health delivery research, with Ministry of Health (MoH) and District Health Boards (DHBs) also significant funders. In 2007/08, the HRC funded \$21 million of health delivery research; 32% of their total health research investment for that year. Public sector agencies, including MoH and DHBs, funded a further \$17 million.
- Most health research is done in universities, with these organisations and other tertiary institutes undertaking a reported \$124 million of health-related R&D in 2006; 46% of total health-related R&D across government, higher education and business sectors.
- In 2007, 982 applications for human health research were approved by New Zealand regional health ethics committees. Of these, 144 were for trials sponsored by a pharmaceutical or medical device company, 404 were for clinical trials funded from other sources, and 434 were for clinical and non-clinical research other than trials.
- Clinical academics make up 21% of the HRC-funded research workforce and are the fastest growing health research workforce category. Full-time equivalents (FTEs) in this area are still small at 36 (compared with 391 overall), but numbers of individuals are much higher at 273, reflecting their main roles as clinicians.

2 Introduction

Health research makes critical contributions to the efficiency and effectiveness of health services, their transition to new models of care, and support for better health for New Zealanders and others. It covers a vast range of areas, from basic biomedical research — aimed at improving our understanding of biological and psychological processes in health, disease and disability — to the development of potential therapeutic methods (pharmaceutical and technological), clinical and public health research, and research on the effectiveness and efficiency of health services and programmes.

This report focuses on a sub-set of health research — that undertaken with the primary intention of directly improving people's health through the application of knowledge, or improving the effectiveness and efficiency of health and disability services. This is predominantly 'applied' research which, for the purpose of this report, is called 'health delivery research'.

This type of research is important if New Zealand is to make the best return on investments in underpinning research and have the evidence and skills to put in place robust, cost-effective improvements and innovation in health services.

The amount and nature of health delivery research in New Zealand is poorly understood. This report was therefore developed to provide greater clarity about the amount and sources of funding, the key research players, and the environment in which the research activity occurs. This report does not, in itself, contain any recommendations for change. It has however been prepared to inform strategic health research and innovation policy development across government. This includes the development of the 'Innovation in Health Delivery' initiative led by the Ministry of Research, Science and Technology (MoRST) and MoH¹ which identifies opportunities for strengthened research investment and coordination in this area.

This report focuses on mostly applied health delivery research, but it is important to recognise that all types of health research contribute to health service improvements and innovation. Basic research underpins applied research, can directly inform clinical practice, and discoveries with significant impact often have basic or untargeted research as their source. New Zealand needs to support a spectrum of research capability and this principle provides an important preface to this report.

¹ <http://www.morst.govt.nz/current-work/transformational-rst/health> Accessed March 2009

3 Information Sources and Definitions

The information presented in this report was gathered from published sources of information on health research funding, expenditure and capability. Key sources of data were Statistics NZ, MoRST, HRC and MoH.

Published sources of information were supplemented with information from interviews with a range of people involved in health research at various levels (listed in Annex 1). These interviews were not intended to be a comprehensive survey but were carried out to collect views on some of the key factors affecting health research, and to gain an overview of the range of health delivery research occurring in New Zealand.

A further analysis of HRC funding contracts provided the opportunity to quantify their health delivery research investments.

All funding data in this report are presented as GST exclusive. Data in tables are rounded and therefore may not add up exactly to totals. Where possible, data is presented for 2007/08 financial year actuals.

3.1 DEFINING HEALTH DELIVERY RESEARCH

For the purpose of this report, health delivery research was considered to include research for which the primary objective is to improve:

- individual and community health and disability status through improved prevention, treatment, management and support
- health and disability services practice, delivery and management
- community and population health and disability status through improved policy, prevention and community-level interventions.

In these areas, new knowledge or evidence is created but the main focus is on its relevance to the questions or problems at hand, rather than its contribution to the national or international knowledge base. This research tends to have an operational focus, sometimes with relatively short timeframes from research to delivery (a few years), but longer term research is common as well.

For this report, health delivery research was distinguished from research with different primary objectives, namely from:

- ‘health research for knowledge’, which tends to be more discovery-driven, with science quality and contributions to the international knowledge base being important criteria. In this research, health outcomes still provide strong context but the direct application of knowledge to New Zealand health delivery or clinical care is not an immediate focus or a significant part of the project design
- ‘health research for wealth’, which covers health-related research activities funded primarily to contribute to economic goals, for example commercial

product development. The spillover benefits to the health system in New Zealand are however evident in many, for example in developing commercial products and services to health services.

There are inevitably grey areas at the intersections of these groupings, especially between health delivery research and health research for knowledge, where it is relatively common to have research which aims to contribute equally to health service improvements and to the knowledge base. Where this occurred, the analysis included this type of research within the scope of health delivery research. We also acknowledge that in some situations, for example with breakthrough findings in genetics, 'health research for knowledge' can contribute directly to improved practice or health outcomes without it being a primary aim of the research.

These groupings were identified for the purpose of this report only and not intended to be new categories that directly inform research investment strategies or decisions.

4 The Strategic Context for Health Research Investment

In common with other developed nations, New Zealand faces a series of interlinked challenges affecting both the health and well-being of its people, and the ability of health and disability services, as well as the wider New Zealand society, to meet these challenges. Pressure on health and health and disability services is increasing through factors such as:

- growing and ageing population and increasing proportions of Māori, Pacific and Asian people and migrants
- rising incidence of long term conditions such as diabetes and obesity
- society's rising expectations of health and disability services
- growing costs of pharmaceuticals, technologies and therapies
- workforce shortages
- need for expansion and re-development of health care facilities due to the above factors.

The health sector is also a major part of New Zealand's society and economy — as a provider of important services to the community, an important employer, a substantial user of medical and general equipment, energy, products and services, and an important source of waste and greenhouse gases². Wider issues such as climate change, food production, energy, resource use, waste minimisation and transport, will increasingly have impacts on both the health of New Zealanders and the country's health and disability support services.

Health related R&D by New Zealand researchers and companies also has the potential to make a contribution to the economy by creating new, innovative products and services which may be commercially viable and provide a source of export revenue for New Zealand.

Research plays a pivotal part in meeting these challenges and opportunities, by informing public policy, improving health service management and delivery, supporting effective clinical practice at all levels, and promoting population and public health programmes, within the resources available.

Public funding for research is linked to government strategic priorities, and identified by specific government strategies and departmental Statements of Intent.

4.1 HEALTH STRATEGIES

The government's health priorities are described in the New Zealand Health Strategy (NZHS) which sets out a number of principles for all health services and

² In comparison, the UK National Health Service accounts for about 2.7% of UK CO₂ emissions.

strategic development, such as:

- acknowledging the Crown's relationship with Māori
- promoting good health and well-being throughout life
- improving health for disadvantaged people
- timely and equitable access to health and disability services
- high performance health services
- active involvement of consumers and communities.

He Korowai Oranga (2002) sets out the government strategy for improving Māori health, which emphasises whanau ora and reducing inequalities. A strategic research agenda has been developed in this area.

The New Zealand Disability Strategy (2001) presents a long term plan for making New Zealand a more inclusive society, enhancing participation for people with impairments.

Specific strategies which have research components or strategies³, include:

- the Cancer Control Strategy (2003), which will include a specific research strategic plan
- the Child Health Strategy (1998)
- Healthy Eating Healthy Action (2003)
- The Tobacco Control Strategy (2004)
- Strategic Vision for Oral Health (2006)⁴.

MoH also has a series of Health Targets which, while not directing research, provide a focus for health sector improvement and innovation⁵.

4.2 RESEARCH STRATEGIES

Ministry of Research, Science and Technology

'From Strength to Strength – Government's Agenda for New Zealand Research, Science and Technology (2008)' sets the high level direction for public investment in RS&T in New Zealand. It identifies four priority challenges:

- to sustain our science base
- to focus new science
- to propel business R&D
- to connect New Zealanders with science.

³ http://www.moh.govt.nz/moh.nsf/wpg_index/Publications-Strategies Accessed March 2009

⁴ An oral health research fund was announced in 2007 by MOH and the NZ Dental Association.

⁵ <http://www.moh.govt.nz/healthtargets> Accessed March 2009

It identifies 'Innovation in Health Delivery' as one of six Transformational RS&T areas as priorities for future funding.

Ministry of Health

MoH does not have a research strategy per se; rather, it develops the broader health research priorities based on the New Zealand Health Strategy, the Health Targets, and the MoH Statement of Intent in conjunction with MoRST. These are signalled to the HRC and reflected in the HRC Statement of Intent and Strategic Plan.

MoH has a number of current strategies which have research components, for example, the Healthy Eating Healthy Action, Tobacco Control and Cancer Strategies.

The HRC is the main public funder of health and disability research in New Zealand, and its research priorities are aligned with Government strategic priorities in research, health and disability. Its Strategic Plan 2008–2013⁶ describes four goals to:

- invest in research that meets New Zealand health needs and research that has international impact
- maximise the benefits of health research
- champion the integrity of the health research environment
- enhance the value of the organisation.

A consultation paper released in November 2008 outlines options to update their investment mechanisms to allow them to better deliver on this Strategic Plan⁷. The options are intended, among other things, to enable more flexibility in their investments, and to better support the priority needs of the health sector while maintaining research of international standing.

The HRC currently assesses applications for research funding on two sets of criteria, firstly on scientific merit, design and method, health significance, and researcher track record, and then in relation to the HRC's priorities. These priorities are based on whether the research proposal is assessed as:

- a high priority for one or more of the HRC's priority populations groups (Māori, Pacific peoples, children and youth, older adults, and people with disability)
- Māori development research aligned with MoRST's Vision Mātauranga

⁶ http://www.hrc.govt.nz/root/Publications/Corporate%20Publications/Policy_and_strategies.html
Accessed March 2009

⁷ http://www.hrc.govt.nz/root/pages_policy/New_Research_Investment_Process.html Accessed March 2009

- relevant to one or more of the HRC's Research Portfolio strategy priorities
- addressing priorities identified in the New Zealand Health Strategy
- addressing priorities identified in the New Zealand Disability Strategy
- research contributing to the development and retention of the health research workforce
- meeting the criteria for translational research.

District Health Boards

District Health Boards have recently started to develop a more strategic perspective on the funding and use of research to address the range of key knowledge gaps which directly affect the health of their populations and the effectiveness of their services.

The District Health Board Research Fund (DHBRF) was established in 2005 to fund relevant research in areas identified by DHBs as priorities for funding, planning and services (below), and to support the translation of research into clinical practice:

- chronic conditions
- access to services for vulnerable populations
- translational research in diabetes, obesity and cardiovascular care
- cancer care
- mental health.

The DHBRF Governance Group sponsored a wide-ranging international conference on innovation for health in 2007 and was a key partner of INNOV'08, a health innovation summit.

5 Public Investment in Health Delivery Research

5.1 OVERVIEW OF FUNDING SOURCES AND PATHWAYS

The main source of funding for health delivery research is government, primarily through the HRC (through Vote RS&T funds) and through MoH and DHBs (Vote Health funds). There are numerous other sources for health-related research, although most are not focused on health delivery research. These include:

- other government sources: Foundation for Research, Science and Technology (Foundation) (Vote RS&T funds), Tertiary Education Commission (TEC) (through Vote Education funds), other Votes and government levies
- non-government organisation (NGO) funders, such as the Cancer Society
- private sector businesses
- international funders — both public and private — such as the National Institute of Health and the Gates Foundation.

Mechanisms used for funding research include contestable grants for researcher-initiated research, commissioned research for public and private sector research, and organisational funding for infrastructure, operations and training. Research organisations typically obtain funding from several sources and any particular research programme may have multiple funders.

5.2 INVESTMENT LEVELS

In terms of research performed in New Zealand, health features strongly. In 2006, expenditure across government, business and university sectors on health was \$268.7 million, 15% of total research expenditure (\$1,825.6 million) and the largest individual research expenditure category⁸. Within the total health-related expenditure, the business sector undertook \$102.2 million (38%)⁹, government \$41.8 million (9%), and higher education \$124.2 million (46%). An estimated 3708 people (FTEs) perform this health-related research, around 16% of the total New Zealand research workforce¹⁰.

Total public investment in health-related R&D, estimated from 2007/08 data from research investment agencies, is around \$141 million, around half of total health-

⁸ Statistics New Zealand and MoRST (2007) *Research, and Development in New Zealand 2006*. <http://www.stats.govt.nz/analytical-reports/research-development-new-zealand-06.htm> Accessed March 2009. Data reported here is for R&D toward 'health' as recorded by socio-economic objective (seo).

⁹ Funding could have come from private or public sources.

¹⁰ This data is an estimate of health researcher FTEs by occupation for NZ for 2006. This data is based on total researchers and health seo % data by respondent, from the 2006 R&D survey dataset. This data has been cross-referenced and reconciled with results of total researcher FTE data already reported based on these surveys, particularly relating to higher education sector FTEs.

related R&D performed in New Zealand, and around 17% of total public investment in R&D. This report estimates that in 2007/08, \$38 million of this public investment, or around 27%, was for health delivery research (Table 5.1). This comprised \$21 million through Vote RS&T (HRC) and \$17 million through other central government sources such as MOH and DHBs.

Table 5.1: Estimated public investment in health and health delivery R&D by funding source for 2007/08

Funding Source	Health-related R&D (\$M)	Health delivery-related R&D (\$M)	Proportion of health-related R&D that is health delivery (%)
Vote RS&T	90	21	23
HRC	65	21 ¹¹	32
Foundation	20 ¹²	–	–
Marsden	5 ¹³	–	–
Vote Education	30¹⁴	–	–
All other central and local government	21¹⁵	17¹⁶	81
Total	141	38	27

These are tentative estimates drawn only from an assessment of HRC contracts and data from the wider public sector, being the primary funders in the area. It does not include any direct assessment of Vote Education (e.g. university funds) or Foundation funds, although it assumes that they will have only small investments in health delivery research, as their activity is focused primarily on ‘knowledge’ and ‘wealth’ respectively. Other sources, eg Lotteries Health, may also contribute small amounts. Overall, the estimate of \$38 million is likely to be conservative.

The investment data for central and local government (excluding Vote RS&T and Vote Education) in Table 5.1 is drawn from MoRST’s 2007/08 Public Sector

¹¹ Total of HRC health research classified as health delivery from Contestable, Targeted Research for Health, Māori Health Research, and Partnership Programme funds.

¹² Foundation investments in health-related R&D range are estimated to range between \$15 and \$25 million per annum, primarily through NERF and TechNZ programmes. Due to the variation across years, this table uses the midpoint of this at \$20 million.

¹³ All Marsden projects involving medical and health sciences as a research field.

¹⁴ MoRST estimates the amount of health-related R&D supported through the Performance Based Research Fund to be between \$20 and \$30 million per annum, derived from data supplied by TEC and the Ministry of Education. This does not include funding supporting health-related COREs and other Vote Education research programmes. The upper end of this \$20–30 million estimate is used in this table.

¹⁵ This figure is drawn from data reported in the Public Sector Financing of Research 07/08 survey and includes \$1 million from the DHBRF not included in either HRC or Public Sector Financing of Research Survey. Around three-quarters of this investment is through Vote Health.

¹⁶ Estimated at 80% of total health-related R&D.

Financing of Research survey. The more recent 2008/09 survey records a higher level of planned investment of \$26.7 million (up from \$15 million in 2007/08), made up of government departments (\$14.9 million), DHBs (\$7.1 million), other Crown Entities (\$4.6 million), and local government (\$0.1 million). Some of this increase is due to improved reporting.

The estimate is also from public investment sources only. Private sector investment makes up around 55% of New Zealand's overall (including health-related) investment in R&D. In the health area, investments are in areas such as medical technology and pharmaceutical product and development for both local and overseas markets and therefore may have some indirect impacts on New Zealand health delivery.

The estimate of \$38 million health delivery research for 2007/08 is similar, perhaps slightly higher, than the rough estimates calculated prior to this report. It concurs with our understanding that the majority of New Zealand's public investment in health research is focused on building knowledge, with a smaller proportion — estimated here to be around 27% — directed at health sector improvement and innovation.

It is difficult to compare New Zealand's health delivery research investment with that made by other countries as there is no standard or routine categorisation of health delivery research and different countries have different funding models, e.g. for treatment of overheads. We can, however, note research funding data from:

- the United Kingdom, where the government is supporting budget increases to £1 billion for the National Institute for Health Research (NIHR) (health sector focused research) and £0.7 billion for the Medical Research Council (mostly early stage and discovery research) by 2010/11¹⁷. NIHR programmes include:
 - Clinical Research Facilities: a consortium of funders working under the umbrella of the UK Clinical Research Collaboration, provides £84 million to develop and strengthen clinical research in the United Kingdom and Ireland
 - The NIHR Research Centres which have £459 million over five years to enable leading National Health Service (NHS) and university partnerships to drive progress on innovation and translational research in Biomedicine and NHS Patient Safety and Service Quality
 - Collaborations for Leadership in Applied Health Research and Care (CLAHRCs), supported by £50 million to identify effective new health interventions and support turning these into routine clinical practice.
- Australia, where in 2007 government funding through the National Health and Medical Research Council (NHMRC), their primary funder of health

¹⁷ 2007 Comprehensive Spending Review

http://www.hm-treasury.gov.uk/pbr_csr07_repindex.htm Accessed March 2009

research, was AUS\$342 million for basic science and AUS\$296 million for other research areas including ‘clinical medicine and science’, ‘public health’, and ‘health services research’¹⁸. NHMRC programmes include:

- 2008 Capacity Building Grants for Population Health and Health Services Research: nine capacity-building grants totalling \$18.2 million awarded to university research teams across Australia to support work in population health and health services.

Data from both these countries indicate that, as well as higher per capita spend on health research, they probably also spend a higher proportion of their overall public health research spend on health delivery research than New Zealand.

The following sections in this chapter provide more detail on investment at the level of individual funding agencies.

5.3 HEALTH RESEARCH COUNCIL

Around 97% of the HRCs funding for research comes from Vote RS&T with small contributions from Vote Health and other government agencies, bequests and interest. In 2007/08 they allocated \$65 million for health research plus a further \$4 million for career development.

Of this \$65 million health research investment, \$21 million was identified as health delivery research (summarised in Table 5.1 and described further in sections 5.3.1 – 5.3.5 below). This \$21 million consisted of \$19 million for research approved in the contestable rounds (which includes targeted and Māori research funding), and \$2.0 million for the HRC’s Partnership Programmes. This was 32% of their total health research expenditure in 2007/08.

5.3.1 Methods for analysis of HRC investments

The analysis reviewed the actual lists of HRC contracts for 2005 – 2008 contestable funding rounds, and identified those which were within the health delivery research scope, based on title and abstract.¹⁹

¹⁸ NHMRC research funding trend data <http://www.nhmrc.gov.au/grants/dataset/trend/index.htm>. Accessed March 2009

¹⁹ The HRC classifies the research it funds as ‘pure basic’, ‘strategic basic’, ‘applied’ and ‘experimental development’, using the OECD’s Frascati Manual definitions (see glossary). It also classifies research by HRC funding portfolio and by mapping categories, based on the type of research. Health delivery research could come under a number of these categories and so these standard classifications were judged to be of limited value in estimating health delivery research.

The HRC does have a category of ‘translational research’, but this was considered too narrow for the purposes of the report, with criteria that restrict it largely to clinical or community interventions, with end-user/patient involvement, and short to medium term impact (see glossary).

Annex 2 identifies and provides examples of the types of research that were included and not included in the scope of health delivery research.

5.3.2 Contestable funding round

The contestable funding round is the main investment mechanism used by the HRC. Funds distributed through this vehicle support the operational costs of research as well as salary support. For the 2007/08 round, HRC received 302 proposals for projects, programmes, emerging researchers and feasibility studies. Contracts were awarded for 57 of these proposals, totalling \$63 million²⁰.

Table 5.2 summarises the analysis of these contract types, identifying the amount classified as health delivery research, for the years 2005/06 to 2007/08. Key features seen through this analysis include:

- an estimated \$19 million in health delivery research for the year 2007/08
- some variability across the years analysed, including a higher number of programme grant health delivery research contracts awarded in 2006/07, but no clear pattern of increase or decrease
- most health delivery research funded through project grants (75% in 2007/08), a higher proportion than for other types of health research (overall 45–50% of investment is through the larger programme grants).

Table 5.2: HRC funding approved for health delivery research 2005/06 to 2007/08

Fund type	2005/06		2006/07		2007/08	
	Amount \$M [no. contracts]	% of total fund	Amount \$M [no. contracts]	% of total fund	Amount \$M [no. contracts]	% of total fund
Total contestable funding	61	100	57	100	63	100
<i>Of which classified as health delivery:</i>						
Programme (new)	2.7 [1]	25	1.7 [1]	33	–	–
Programme (extension)	–	–	5.5 [2]	33	3.4 [1]	25
Projects	17 [23]	62	16 [22]	59	14 [15]	48
Emerging Researcher	0.2 [2]	20	0.2 [2]	33	0.2 [2]	20
Feasibility Study	–	–	1.0 [7]	100	0.8 [6]	86
Total	19 [26]	32	25 [34]	44	19 [24]	30

Further breakdowns by HRC portfolio (Table 5.3) and mapping category (Table 5.4) shows that most health delivery research is supported through the 'health and

²⁰ From HRC Release on annual funding round 2008, includes Targeted Research, Māori Research, not Partnership Programme. <http://www.hrc.govt.nz/assets/pdfs/Full%20List%20-%20funding%20round.pdf> Accessed March 2009

disability sector management', 'non-communicable disease' and 'determinants of health' portfolios and involves 'clinical trials' and 'community interventions'.

Table 5.3: HRC-funded health delivery research, by HRC portfolio

Research Portfolio	2007/08 (\$M)
Communicable Diseases	1.4
Determinants of Health	3.9
Health & Disability Sector Management & Services	3.5
Health & Independence of Population Groups	1.0
Injury & Rehabilitation	2.1
Mental Health & Neurological Disorders	1.7
Non-Communicable Diseases	3.7
Rangahau Hauora Māori	2.0
Total	19

Table 5.4: HRC-funded health delivery research, by HRC mapping category

Mapping Category	2007/08 (\$M)
At-Risk Populations	1.0
Clinical Services	2.8
Clinical Studies	0.9
Clinical Trials	5.3
Community Services Intervention	4.0
Knowledge Resources	2.5
Pharmaceuticals/Treatment	-
Risk Factors	2.7
Total	19

5.3.3 Translational research

The HRC has a system for categorising projects (not programmes) as ‘translational research’ although it does not have an investment portfolio in this area as such. All translational research comes within the scope of health delivery research, but is a sub-set of the wider health delivery research defined and identified through this landscape project. Eight translational research projects were approved in 2007/08 (\$9 million), two-thirds of which were for clinical trials. This is smaller than the \$14 million identified for health delivery research projects grants, which included a wider range of health delivery focused research.

5.3.4 Targeted research for health

Funding for targeted research for health was \$5.7 million in 2007/08. This funds research in the priority areas of: Healthy Eating Healthy Action; disability; Pacific health; primary care; rural health; health and disability sector workforce; and health services. Contracts supported with this funding are likely to be within the scope of health delivery research, are allocated through the contestable funding round, and are included in the analysis presented in Table 5.2.

5.3.5 Māori health research

Funding for Māori health research was \$1.7 million in 2007/08. Some of the contracts supported with this funding will be within the scope of health delivery research, and are included in the analysis presented in Table 5.2.

5.3.6 Partnership Programme

The HRC’s Partnership Programme²¹ focuses on linking research, policy and outcomes, facilitating cross-sectoral solutions to cross-sectoral problems.

²¹ HRC of New Zealand (2008). *Partnerships for Evidence-Based Public Policy*, Wellington, HRC, http://www.hrc.govt.nz/root/Partnerships/The_HRC_Partnership_Programme.html Accessed March 2009

The HRC's funding for the research under the Partnership Programme was \$2 million in 2007/08. Similar funding is contributed from partner agencies. Most Partnership Programme projects were considered to fit within the health delivery scope; these are summarised in Table 5.5.

Table 5.5: HRC Partnership Programmes²²

Partnership	HRC contracts awarded	Partner funding
<i>HRC/Ministry of Health Joint Ventures</i>		
Primary Prevention of Cancer and other Chronic Diseases Research Strategy	\$0.6M for 1 project in 2008	\$5.4M over 3 years (MoH \$4.2M, HRC \$1.2M)
National Diabetes Research Strategy	\$1.35M for one project over 4 years, starting 2004	\$1.5M over 3 years (MoH \$0.75M, HRC \$0.75M)
Disability Research Partnership	\$0.8M for 2 projects in 2005, 2006	\$0.88M over 17 months (MoH \$0.17M, HRC \$0.71M)
Family Violence Evaluation Project	\$0.22M for 1 project in 2003	MoH \$0.22M
Immunisation Research Joint Venture	\$1.1M for 4 projects in 2008 \$0.69M for 1 project in 2004	\$2.4M over 6 years (MoH \$1.2M, HRC \$1.2M)
Māori health joint venture	\$0.65M for 1 project in 2004	Total of \$2.73M over 6 years (HRC \$1.31M, MoH \$1.32M, ACC \$0.1M)
Nursing Turnover Research Project	\$0.1M for 1 project in 2003	MoH \$0.1M
Pacific Health Research Programme (including Pacific Health Workforce Awards and Pacific mental health workforce)	\$0.15M for 2 projects in 2005	\$0.8M over 3 years (MoH \$0.4M, HRC \$0.4M)
Primary Health Care Strategy	\$2.39M for 1 project in 2004	Total of \$2.39M over 6 years (MoH \$1.34M, HRC \$1.05M)

²² Figures for research partnerships from different agencies are included in their respective funding identified in their respective sections to avoid double counting this funding. Funding for the partnerships varies from year to year, so figures in this table should not be added.

Problem Gambling Research MoH, Problem Gambling Committee	\$50,000 for 1 project in 2003	MoH \$0.73M over 3 years
Product Vigilance Joint Initiative Medsafe	\$0.18M for 2 projects in 2007/08	Approx \$1M over programme, (MoH \$0.75M, HRC \$0.75M)
Evaluation of Health Sector Reforms Ministry of Health, Treasury, State Services Commission	\$1.1M for 1 project in 2001 (6 year project)	\$1.1M over 3 years (MoH \$0.48M, HRC \$0.61M)
<i>Joint Research Portfolios</i>		
Environmental Health Joint Research Portfolio Ministry for the Environment, Ministry of Transport (with MoH, ARC, CRC)	\$1M over 4 years for Health and Air Pollution in New Zealand project - completed	
Socio-Economic Determinants of Health Joint Research Portfolio Projects jointly funded with MSD, MoH, Ministry of Education, Families Commission, EECA, Housing NZ, MYD, Ministry of Justice, Multiple Sclerosis Society, ALAC, ACC, Nga Pae o Te Māramatanga	\$1M for 1 project in 2005 on Pacific alcohol problems	Total funding of \$1.13M from HRC (\$0.3M), ACC (\$0.45M) and ALAC (\$0.38M) over 3 years).

5.3.7 District Health Board Research Fund

The HRC administers the District Health Board Research Fund (DHBRF) which was established in 2005 to fund research projects of direct relevance to DHBs. The DHBRF has \$6.2 million available over four years. Expenditure on these projects totalled \$0.9 million in 2007/08. The DHBRF is funded by DHBs (from Vote Health) and discussed further in Section 5.8.

5.3.8 International Investment Opportunities Fund

The International Investment Opportunities Fund (IIOF) has aims of:

- increasing the ability of NZ researchers to participate in research collaborations that attract international co-funding
- to recruit highly experienced researchers from overseas
- to support participation in international research programmes with a high relevance to New Zealand's economic, social and/or environmental development.

Since 2006 the HRC has awarded 16 IIOF grants, a total \$5.5 million. Topics include cardiovascular risk reduction, nursing workforce health, respiratory disease and cancer chemotherapy. Some of this activity may support health delivery but was unable to be assessed in this project.

5.4 FOUNDATION FOR RESEARCH, SCIENCE AND TECHNOLOGY

The Foundation is the principal public funder of research in New Zealand, with a research budget of nearly \$500 million in 2007/08.

Health-related research funded through the Foundation includes some biotechnology, the early phases of drug discovery and development of medical technologies, and information technology research. Most of this research is in the early development or pre-trial development phase for potential commercial application and therefore directed primarily toward wealth generation rather than New Zealand health delivery. Health-related Foundation investments identified through direct discussions with the relevant strategy manager are:

- New Economy Research Fund – Future Human Technologies (NERF-FHT) which has funding of around \$24 million per annum, but varying depending on contract timelines. Most of this portfolio is health-related, covering work in pharmaceutical and medical devices research and development.
- Research for Industry – High value manufacturing products, processes and services (RFI-MAN), which had \$9.5 million contestable funds available in 2007/08, some of which could have supported potentially high value medical technologies.
- The TechNZ programme which provides support for businesses to develop new technology-based products, processes and services. Its funding for medical and health technologies and services research and biotech research varies considerably, depending on what applications are made: \$12.8 million in 2005/06, \$1.8 million in 2006/07 and \$2.9 million in 2007/08.

Together these funds contribute around \$15 – \$25 million per annum for health-related R&D.

Foundation funded health-related projects are generally for the early stage of development of innovative treatments and technologies. This early stage research of biotechnology and new pharmaceuticals research may produce important new discoveries which could have wide application and be commercially important. Commercial benefits are not restricted to the end product, but can also come throughout the developmental process, from technological spin-offs, conducting trials and the development of manufacturing capacity which can be used for other product development.

These investments were not analysed to assess their fit with the definition of health delivery developed for this project. However, we can assume that most are outside the health delivery research scope, but of significant interest for their spillover benefits including the development of capability.

5.5 MINISTRY OF HEALTH

MoH has several pathways for funding health research:

- research partnerships with the HRC
- research projects carried out by the Health and Disability Intelligence group within MoH
- commissioned research on a range of health and disability policy-related research projects led by various directorates in MoH
- contracted operational research, policy studies, and science services²³.

Each of MoH's directorates is responsible for its own research projects and appropriate research funding, although a new Research Commissioning and Evaluation Unit (in Health and Disability Intelligence group) is developing an overview of the activity.

In 2008/09, \$8.7 million was budgeted for R&D by MoH plus a further \$1.6 million for HRC-administered Partnership Programme projects. An additional \$6.6 million was budgeted for policy-related studies and \$0.3 million to support HRC functions. Health delivery research funded by MoH may therefore be estimated as \$10 million for 2008/09, 39% of total planned public sector investment in health-related R&D for 2008/09 (\$26.7 million)²⁴.

5.6 ACCIDENT COMPENSATION CORPORATION

ACC approved funding of \$3.7 million for research in 2007/08, related to injury prevention, treatment, rehabilitation and compensation. Of this around \$1 million can be categorised as health delivery research.

Their Research and Development Strategy identifies a number of gaps in knowledge and practice, primarily related to rehabilitation and disability, where research would be useful to help address problems.

²³ Examples here include: public and environmental health and communicable diseases research and science services from ESR, mental health research managed through Te Pou, pharmacovigilance research through MedSafe and the University of Otago, and policy research and evaluations funded through the National Health Committee and Public Health Advisory Committee.

²⁴ Note this estimate uses 2008/09 data, higher than the 2007/08 data reported in Table 5.1.

5.7 PHARMAC

PHARMAC funds pharmacoeconomic assessment as part of its role in purchasing pharmaceuticals, plus research on prescribing and dispensing patterns, and evaluation of its programmes. Research funding levels were not obtained for this project.

5.8 DISTRICT HEALTH BOARDS

While there is a considerable amount of health research undertaken within DHBs (see Section 6.3), the organisations themselves have limited research funds. Research is specifically excluded from DHB's operational funds, although services audit can be included within quality management. As a result, DHB management is seen by some researchers to be indifferent to research or discouraging staff involvement because of the effect on outputs.

With no public funding for research, pharmaceutical trials provide the funding for most DHB-based research, with other funding coming from the surpluses from pharmaceutical research (generally administered through the DHB's trusts), medical research trusts and philanthropic organisations.

DHBs responding to MoRST's annual Public Sector Financing of Research survey reported budgeted (public sector financed) funding for research as \$4.7 million for 2007/08 and \$7.1 million in 2008/09²⁵. Because of the nature of this survey, these estimates should be regarded as indicative only.

DISTRICT HEALTH BOARD RESEARCH FUND

The District Health Board Research Fund (DHBRF) was established in 2005 to fund small to medium sized research projects of direct relevance to DHBs. The DHBRF has \$6.2 million available over four years.

Priorities have been identified as: chronic conditions, access to services, cancer, mental health and translational research in cardiovascular disease, diabetes and obesity. The DHBRF uses a competitive tender process to select research projects in the identified areas, administered by the HRC.

To date, three projects have been funded: Access to services for vulnerable populations (\$1.5 million over three years); Alleviating the burden of chronic conditions in New Zealand (\$0.5 million over two years); and Integration of mental health care within a primary care setting (\$1 million over 18 months). Expenditure on these projects totalled \$0.9 million in 2007/08. A request for proposals for research on translational research in cardiovascular disease, diabetes and obesity has been released and closed in November 2008. Seven projects were funded to a value of \$0.65 million out of a total pool of \$1.5 million. A second round of this RFP is to be released in early 2009. The request for cancer research proposals was

²⁵ Source: Public Sector Financing of Research survey (2007 and 2008), MoRST. <http://www.morst.govt.nz/publications/statistics/financing-research-2007-08/> Accessed March 2009

released in October 2008, closing in November 2008, with a funding decision available in February 2009.

5.9 ALCOHOL ADVISORY COUNCIL OF NEW ZEALAND

The Alcohol Advisory Council (ALAC) funds research in support of its strategic priorities and its outcomes monitoring programme. Research funding is around \$1 – 1.3 million per year, of which a third to half can be estimated to be health delivery research. All ALAC funds come from a levy on alcohol, collected through NZ Customs, rather than Vote Health.

ALAC has funded a range of research, in areas such as assessing the health, social and economic impacts of alcohol, effective alcohol and addiction services, alcohol-related brief intervention in primary care, health promotion and injury prevention. ALAC's research partners include ACC, MOH, the Police, Ministry of Justice, university departments and clinicians. There has been a focus on Māori and Pacific issues in alcohol, especially around alcohol and addiction interventions and mental health.

Evaluation for programmes is seen as supporting long term viability for both ALAC's internal programmes and alcohol-related programmes in the health and social sectors (for example, evaluation of addiction interventions in prison/justice sector).

ALAC has five priority areas to guide future research funding:

- support for community action
- early help-seeking, especially in primary care
- policy and regulatory change
- drinking environments
- knowledge, skills, education.

5.10 TERTIARY EDUCATION COMMISSION

The Tertiary Education Commission (TEC) contributes to health delivery research, through its baseline investment in operating funding plus through PBRF (\$236 million in 2008/09), and some of the Centres of Research Excellence (CoREs), Partnerships for Excellence and Building Research Capability in Strategically Relevant Areas (BRCSRA) investments (outlined below). The proportion of the PBRF that supports health research activities cannot be directly identified but has been estimated by MoRST to be between \$20 and \$30 million per annum.

CENTRES OF RESEARCH EXCELLENCE

The TEC provides funding for the CoREs, three of which are involved with health research to some extent and all hosted by the University of Auckland:

- The National Research Centre for Growth and Development

- Nga Pae o te Maramatanga
- The Maurice Wilkins Centre for Molecular Biodiscovery

PARTNERSHIPS FOR EXCELLENCE

- The National Institute for Health Innovation (NIHI) was established in 2008 to carry out research in health IT and information management and funded through a Partnerships for Excellence fund of \$7 million with matching funding from partner companies

BUILDING RESEARCH CAPABILITY IN STRATEGICALLY RELEVANT AREAS

The STAR project²⁶ (Strategy To Advance Research) is a \$2.7 million project started in 2007 which aims to build research capability in nursing and associated health disciplines, develop Māori, Pacific and Asian researchers, and foster research collaboration. The project is a collaborative effort among five universities: Auckland, AUT, Massey, Otago and Victoria.

5.11 LOTTERIES HEALTH RESEARCH

The Department of Internal Affairs has responsibility for the New Zealand Lotteries Grants. Its Health Research Committee distributes funds for health and biomedical research with relevance to the health status of New Zealanders. In the 2006/07 year, this was \$2.9 million for research projects, shared equipment and PhD scholarships²⁷. Less than \$0.5 million is estimated to be health delivery research.

5.12 MINISTRY OF SOCIAL DEVELOPMENT

The Ministry of Social Development funds some health and social policy-related research, often jointly with other central government agencies. Examples include the annual Social Report, which compiles health and social sector information, Youth 2000 and Youth 2007, jointly funded by MSD, the MoH, ACC, ALAC and other agencies and Growing up in New Zealand, a new longitudinal survey. None of this research is sufficiently relevant to health delivery to be included in our funding levels estimates for this project.

5.13 COMMUNITY, NGO AND CHARITABLE SECTOR

Community and non-governmental organisations are important research funding sources for medium and smaller research projects, and research that is outside the funding criteria for the main public funders. These organisations provide around \$12 million a year in project grants, infrastructure support and researcher assistance. Most goes toward biomedical research, laboratory studies, and

²⁶ <http://www.starproject.ac.nz/>

²⁷ www.dia.govt.nz/diawebsite.nsf/wpg_URL/Services-Lottery-Grants-Index?OpenDocument#2 accessed March 2009 and Lotteries Grants Record [http://www.dia.govt.nz/Pubforms.nsf/URL/LGRecord08.pdf/\\$file/LGRecord08.pdf](http://www.dia.govt.nz/Pubforms.nsf/URL/LGRecord08.pdf/$file/LGRecord08.pdf) accessed March 2009

researcher assistance, rather than clinical studies or health delivery research.

Funders include:

- The Cancer Society of New Zealand, which funds approximately \$2 million per year in cancer-related research projects, \$2.2 million for the Cancer Research Unit at the University of Auckland and \$0.3 million for the Social and Behavioural Research Centre at the University of Otago
- The National Heart Foundation of New Zealand, which funds approximately \$2 million per year on heart disease research
- The Neurological Foundation of New Zealand funds \$1 million a year for neurological research, mostly biomedical research projects, with some clinical and translational research, and a clinical research fellowship
- Medical Research Foundations in a number of regions fund health research, scholarships, fellowships and travel for researchers. The larger foundations are based in Auckland (funding around \$1.6 million per year), Canterbury (\$1 million in 2007), Wellington (around \$400,000 per year), Otago (\$150,000), Waikato (\$130–150,000 per year) and Hawke's Bay (\$90,000 in 2007)
- Asthma and Respiratory Foundation (\$50–90,000)
- The Maurice and Phyllis Paykel Trust funds health research projects, equipment, travel and scholarships
- The Starship Foundation supports the Children's Research Centre at Starship Hospital and makes small research awards
- Other charitable funders, such as the ASB Community Trust, fund varying amounts of health research.

5.14 PRIVATE SECTOR

There are no good estimates of the amount of private sector investment in health-related R&D in New Zealand, although from the 2006 R&D survey the business sector reported performing \$102.6 million of health-related research, this being funded from both private and public sources²⁸.

What is of most interest to us in the context of this project however, is research that is being funded privately but carried out in a publicly-owned organisation, such as a university or a hospital. This sort of arrangement provides the opportunity for wider 'public' benefits as the activity and its income stream can enable in-house capability building. Sources for this type of activity include:

- Multinational pharmaceutical companies which conduct Phase 2 and 3 clinical trials in New Zealand. According to industry group Researched Medicines Authority (RMI), pharmaceutical industry research and development funding is

²⁸ Source: R&D in NZ 2006, MoRST/Statistics 2007

around \$20 million per year, down from \$100 million per year a decade ago²⁹. The scope of this R&D is not well described in the RMI website.

- New Zealand firms, such as Fisher and Paykel Healthcare Ltd, which contract or establish joint ventures with public research or health service organisations to carry out research.

A recent report on the medical technologies sector³⁰ identified around 90 New Zealand firms in this sector, with an output of \$553 million. Around 67 of these were commercially active (rather than being at earlier R&D stage) with a combined research expenditure estimated at \$56.6 million. Participants interviewed for the report identified opportunities/needs for more product development funding support, integration across government policy and schemes, intermediaries between university, firms and the health sector, and incentives for DHBs to encourage research.

5.15 INTERNATIONAL PUBLIC AND PHILANTHROPIC SECTOR FUNDING

New Zealand researchers are commonly involved with international research programmes funded by international public and philanthropic funders. There is no estimate of how much of this funding is relevant to New Zealand health delivery.

A number of trans-Tasman projects receive part funding from the Australian NHMRC, and there are a small number of projects funded by the US National Institute of Health and other public agencies.

The Children's Oncology Group, based in the United States, organises international clinical trials on child cancer treatment, and obtains funding from a wide range of public and philanthropic sources. New Zealand paediatric oncology researchers are involved with its programme.

²⁹ www.rmianz.co.nz

³⁰ AERU, flicka. New Zealand Medical Technologies: A Sector Overview, 2008. Available through: www.nzbio.org.nz

6 Research Organisations

Many organisations are involved in performing health research. The scope of this project did not allow for a comprehensive survey of all these organisations, so this section gives overview information and some highlights with a focus on the most research-active organisations.

6.1 UNIVERSITIES

The majority of publicly funded health research, and health delivery research, is carried out through universities, principally through the schools of medicine and health sciences at both University of Otago and Auckland, and often in conjunction with DHBs. Universities and other tertiary organisations play a key role in performing the underpinning and applied research required to support health delivery and training the health workforce that will ultimately use the knowledge. Overall, the higher education sector performed \$124 million of health-related R&D in 2006³¹, 46% of total health-related R&D across government, higher education and business sectors. The following sections outline health research capability in New Zealand's universities.

University of Otago

The University of Otago's Division of Health Sciences consists of the Faculties of Dentistry and Medicine and the Schools of Pharmacy and Physiotherapy. The Faculty of Medicine itself consists of four schools located in Dunedin (Dunedin School of Medicine and the Otago School of Medical Sciences), Christchurch and Wellington. All departments are research active, hosting research centres or applied research units, and many are involved in health delivery research. Further information can be found in the Division's research reports or website³². At University of Otago the synergy across the spectrum of research between basic and biomedical research and applied research is seen as crucial in developing innovative solutions to health problems at all levels. The University of Otago was awarded HRC funding of \$28.6 million in 2007/08 and \$21.7 million in 2008/09.

Each of the medical schools (located in Dunedin, Christchurch and Wellington) has its own scope and style of research programme. For each, the relationships between the university and health services are crucial.

³¹ Statistics New Zealand and Ministry of Research, Science and Technology (2007) *Research, and Development in New Zealand 2006*. Wellington, StatsNZ and MoRST, <http://www.stats.govt.nz/analytical-reports/research-development-new-zealand-06.htm> accessed March 2009. Data reported here is for R&D toward 'health' as recorded by socio-economic objective.

³² <http://healthsci.otago.ac.nz/research/centres.html> Accessed March 2009

DUNEDIN SCHOOL OF MEDICINE

Some highlighted research areas for the Dunedin School of Medicine include cardiovascular and respiratory disease, injury risk, screening, patient safety, cancer prevention and treatment. The Otago DHB is a key partner. The Dunedin Multidisciplinary Health Development study is a high profile research programme which has made major contributions to our understanding of the links between early childhood development and health and social outcomes. Childhood obesity and nutrition research are also key research themes in health delivery research.

ORAL HEALTH, PHARMACY AND REHABILITATION

The School of Dentistry is undertaking New Zealand-specific oral health services research, including epidemiology and its implications for public health. Service delivery to teenagers and the elderly is a focus as well as workforce issues. Practitioners nationwide and some DHBs (Otago, Taranaki) are key partners. School of Pharmacy research in this area includes prescribing trends for antibiotics and medicines policy in New Zealand. Rehabilitation research is a major focus of the School of Physiotherapy.

UNIVERSITY OF OTAGO, CHRISTCHURCH, SCHOOL OF MEDICINE AND HEALTH SCIENCES

The University of Otago's Christchurch School of Medicine has a number of research centres and is particularly recognised for research excellence in areas of cardiovascular health, mental health, child health, pathology, cancer and public health. Located primarily on the Christchurch hospital campus, it works in partnership with Canterbury DHB as well as other local partners.

UNIVERSITY OF OTAGO, WELLINGTON, SCHOOL OF MEDICINE AND HEALTH SCIENCES

Applied and health delivery related research at the Wellington School of Medicine includes research in primary care, asthma, renal disease, sleep, disability, pregnancy and child health, primary and community mental health services, anaesthetics, cancer treatment and surgery, public health and health services. The Housing and Health research programme has a high profile and has produced important findings. There is an important interface with the Ministry of Health, especially in housing, health inequalities and health services.

University of Auckland

The University of Auckland's Faculty of Medical and Health Sciences has a broad range of research programmes in biomedical, clinical and public health areas. Health research accounts for over 60% of all research funding awarded to the University of Auckland³³. This includes contracts awarded by the HRC in 2007/08 of \$13.6 million, \$29 million in 2008/09, plus commercial research and funding

³³ Reported on web site: <http://www.fmhs.auckland.ac.nz/faculty/research/research.aspx>

from philanthropic organisations. Auckland UniServices holds the contracts for applied and commercial research at the University of Auckland. Staff in the Faculty of Medicine and Health Sciences won \$32M worth of research and consulting contracts in 2008/09.

The University of Auckland has 17 centres, units and institutes involved in health research, as well as each clinical department³⁴. Prominent research areas among many include: cancer research through the Auckland Cancer Society Research Centre, Oncology Department and Paediatrics Department; Clinical Trials Research Unit research on cardiovascular disease prevention, smoking, obesity and nutrition; and links between fetal and child development and disease in later life, at the Liggins Institute.

Clinical research in the hospital setting is carried out through the three DHBs in the Auckland region as well as the Waikato Clinical School (see DHB section starting p 34).

Auckland University of Technology (AUT)

AUT's Faculty of Health and Environmental Science's teaching programmes cover physiotherapy, pharmacy, occupational therapy, nursing, midwifery, paramedics, psychology, psychotherapy and oral health. Their research programmes include Pacific Island Families research, activity and sport, urban design, biomedical instrumentation, stroke rehabilitation, family violence, gambling, addiction, migrant health and nutrition. Their Health and Rehabilitation Research Centre was established in 1998, supported through both institutional and competitive research funding. In both teaching and research they encourage multi-disciplinary approaches and see particular value in ensuring appropriate project management support. AUT's links with business and other external groups supports their emphasis on research that also integrates development and deployment.

University of Canterbury

The University of Canterbury is active in health-related research, particularly in the areas of bioengineering, applied biochemistry (including drug design), advanced imaging, audiology and communication disorders, health technology assessment and health services research. The University has important relationships with Canterbury DHB and with the University of Otago, Christchurch, School of Medicine and Health Sciences.

³⁴ For further information see <http://www.fmhs.auckland.ac.nz/>

Massey University

Health research at Massey University is mainly conducted in its Faculty of Nursing Studies and its health research centres, such as:

- Te Pumanawa Hauora³⁵ which has a focus on Māori health research in areas including tobacco, mental health and well-being, diabetes, hepatitis B, and child health and development
- The Centre for Public Health Research³⁶ which specialises in epidemiological research in occupational and environmental health, asthma and cancer
- The Centre for Social and Health Outcomes Research and Evaluation and Te Ropu Whariki (SHORE/Whariki)³⁷ which conducts research in areas such as alcohol and other drugs, Māori health research, and Pacific health research.

Victoria University

Health delivery-related research at Victoria is conducted primarily through the Health Services Research Centre³⁸ (HSRC) and in the postgraduate programme at the School of Nursing, Midwifery and Health.

The HSRC has around 20 academic and research staff. Its current research includes evaluations of the Primary Health Care strategy, Healthy Eating Healthy Action strategy, as well as research on surgical priority setting, service access and utilisation, Māori health services and Pacific health.

The School of Nursing, Midwifery and Health has around 30 Masters and PhD students undertaking research into nursing and midwifery professional practice, patient and family/whanau experience, aspects of care in community, primary, secondary, tertiary and mental health and disability services.

Victoria University also hosts the Malaghan Institute for Medical Research.

Waikato University

Health research is not a main focus of Waikato University. The university does, however support strong capabilities in areas such as social sciences, psychology, computer studies, biology and management, with potential relevance to health services.

Lincoln University

Health research is not a focus of teaching or research at Lincoln University.

³⁵ <http://hauora.massey.ac.nz/>

³⁶ <http://publichealth.massey.ac.nz/>

³⁷ <http://www.shore.ac.nz/>

³⁸ <http://www.victoria.ac.nz/hsrc/>

6.2 CROWN RESEARCH INSTITUTES

New Zealand has no 'health-focused' CRI as such, although the role and capability of Environmental and Science Research (ESR) is closely aligned with the health sector. IRL also has relevant capability in health technology development, while a number of other CRIs have collaborations with universities in the health area³⁹. As reported for the 2006 R&D survey, CRIs overall performed \$23 million health-related R&D.

Environmental and Science Research

ESR is a science and research CRI primarily servicing Government clients in health and justice sectors. ESR has a growing research portfolio in the areas of health, social, environmental and molecular biology. ESR's funding from MoH is primarily for what is termed 'operational research', which includes research in public health (e.g. communicable disease surveillance and reference laboratory, environmental health and water quality) and laboratory science methods (to support other research). Research is mainly oriented towards improving its services to ESR's mostly government clients.

ESR's main areas of health research and related activity are:

- communicable disease, human biosecurity and surveillance
- environmental health
- food safety
- water management
- integrated research for sustainability (IRfS Group)
- reference and specialised laboratory services.

In the food safety science research area, ESR is increasingly involved in international collaborative EU-funded Framework Programmes.

Industrial Research Limited (IRL)

IRL is a CRI specialising in science, technology and engineering, and commercial development of its research. IRL's health-related research is in developing medical devices, devices for independence, pharmaceutical drug discovery and development, and medical screening, scanning and sensing technologies. Public funding for this research is primarily from the Foundation and for commercial outcomes, however they have collaborations with universities (e.g. University of Otago physiotherapy school) and health service delivery organisations (such as the Burwood Academy of Independent Living).

³⁹ For example, AgResearch's collaborations with the Liggins Institute in food and biological research and University of Otago in reproduction and genomics.

6.3 DISTRICT HEALTH BOARDS

In 2006, DHBs reported they performed \$16.8 million of R&D, funded from a range of sources⁴⁰. Health research within DHBs can generally be divided into (1) that related to the planning and funding of health and disability services, (2) clinical research and (3) quality improvement–related research and audit.

Funding and planning–related research includes analysis of hospital and primary care utilisation data, epidemiological and demographic analysis and projections, preparation of health needs assessments used in service planning, and health status monitoring. The extent of this research varies considerably between DHBs, with the metropolitan DHBs generally having a number of staff, several with epidemiologists, whereas the smaller provincial DHBs may only have part time analysts.

Clinical research accounts for the bulk of research within DHBs, with a mix of sponsored clinical trials and clinical practice research funded from departmental research trusts and NGO health research funders. DHBs that have links with the university clinical schools generally have active clinical research programmes. This research is supported by DHB research offices in the main centres, which, to varying degrees, co–ordinate and support research, provide methodological assistance, manage relationships with clinical trial sponsors, handle finances and contracts, support risk management and provide research governance. Departments involved in research have varying degrees of access to research facilities and services to varying degrees, and may employ research nurses and assistants. As well as applying to external funders, some departments have research funds, or use surpluses from sponsored research.

Quality improvement research and audit is closely related to clinical practice and service quality management. There is considerable scope for research on innovative practice changes, which have immediate application to practice, for instance those acknowledged through Waitemata DHB’s Health Excellence Awards⁴¹.

Further information on research in a selection of the most research–active DHBs follows or is described in the Universities section previously.

Auckland District Health Board (ADHB) has around 500 active research projects at any time, mainly pharmaceutical trials and clinical studies, with lower levels of clinical practice and health services research. In 2006, 183 research projects were

⁴⁰ Statistics New Zealand and Ministry of Research, Science and Technology (2007) *Research, and Development in New Zealand 2006*. Wellington <http://www.stats.govt.nz/analytical-reports/research-development-new-zealand-06.htm> accessed March 2009.

⁴¹ www.knowledgecentre.co.nz/ accessed October 2008

approved. There are extensive research relationships with the medical school. Active areas include adult and paediatric oncology, haematology, cardiology, liver disease and transplantation, women's health and anaesthetics. However, according to them, there are significant gaps such as in community services/ambulatory care and community programmes for high risk minorities where useful research could be done.

The ADHB Research Office provides support for researchers and assistance in administration, contracting and financial management, and navigating through approval processes.

Counties–Manukau DHB (CMDHB) Funding and Planning Division undertakes a wide range of research to inform its service planning and establishing funding priorities. Hospital service data (district and national) is extensively used, as is demographic and epidemiological information. It is involved in research related to Let's Beat Diabetes, a major community programme to prevent diabetes and reduce its impact for the DHB's population. Centre for Clinical Research and Effective Practice (CCREP) is a charitable trust established in 2001 primarily to facilitate and manage commercial clinical research within Counties–Manukau DHB⁴². It is the most well–developed DHB–linked research organisation in the country. Its activities include financial, contract and trial management, assisting with administration, providing training in research methodology and trial management, audit and dissemination of findings. The CMDHB Research Office deals with non–commercial research within the DHB, and is co–located with CCREP. In developments announced in mid 2008⁴³, Counties–Manukau DHB are developing a new centre for health services innovation, aimed primarily at attracting and training the workforce they need to support their rapidly growing local population. Research and development will be a central part of this new initiative.

Waitemata DHB has an emphasis on clinical research and service innovation. Its Knowledge Centre seeks to 'support... a culture of research excellence through continuous quality improvement'. This support is provided in the form of advice and education about good clinical research process and management, ethical research practice and biostatistical support. It maintains a research management database where all research and audit projects are registered. This is in phase one and the second phase in 2009 will see the roll out of a web interface which will allow all Waitemata DHB researchers to manage the business end of their projects more seamlessly from concept to final reporting. Waitemata DHB sponsors annual Health Excellence awards to promote a sharing of knowledge gained from projects that improve practice, develop and support workforce, encourage community cooperation and equitable access to healthy solutions. Waitemata DHB in

⁴² www.ccrep.org.nz accessed March 2009.

⁴³ www.countiesmanukaudhb.org.nz/ accessed March 2009

association with AUT has a collaboration centre on site at North Shore Hospital and works collaboratively in many health research projects with other universities.

Waikato DHB supports research and teaching, as well as contributing funding of approximately \$0.9 million per year to academic chairs in psychiatry, diabetes and anaesthetics, several clinical researcher/lecturer positions and student scholarships. The DHB hosts and supports the Waikato Clinical School, an academic division of the University of Auckland which has an active research programme. It also hosts the Nursing Research and Development Unit set up in collaboration with Victoria University. Waikato DHB's Healthy Eating, Healthy Action (HEHA) projects, around \$1 million, have research components. Funding is primarily from clinical trials, research surpluses and via philanthropic organisations. Areas of research include primary care, diabetes, Māori health and adolescent health.

Canterbury DHB provides strong support for research with links to both local campuses of University of Otago, Christchurch, School of Medicine and Health Sciences, and the University of Canterbury. CDHB staff are active in collaborative research with research interests in the areas of pain management, infectious disease control, clinical pharmacology, heart disease, blood disorders, diabetes and mental health. They have sponsored an annual Quality Improvement and Innovation Award since 2003⁴⁴ and have recently established a research committee to provide oversight and governance for research within the DHB. CDHB is also in the early stages of developing a health innovation 'hub', in partnership with Canterbury Development Corporation, supporting commercial opportunities linked to its quality improvement programmes. Health innovation hubs in the UK NHS may provide useful models. The University of Otago and CDHB have a joint Research Committee and all CDHB research is now managed via the OUC Research Office.

Otago DHB has had a joint Research Committee with the Dunedin School of Medicine for a number of years and a joint Research Office manages research in the Medical School and the DHB. Areas of joint research include heart disease and vascular medicine, diabetes, paediatrics, ophthalmology and respiratory medicine. ODHB also have joint clinical staff with the Otago University Dental School, who are engaged in facial trauma research and oral health services research.

Capital Coast DHB with the Wellington Economic Development Agency are developing an Innovation Hub at the new hospital, which will be closely linked to the University of Otago, Wellington, School of Medicine and Health Sciences and to health research units at Massey and Victoria Universities.

⁴⁴ <http://www.cdhb.govt.nz/quality/patient-safety/2009awards.htm> Accessed March 2009

Other DHBs. Some of the provincial DHBs have research programmes, notably Hawke's Bay DHB. However, the research capacity in DHBs that do not have links to medical schools is limited.

6.4 PRIMARY AND COMMUNITY HEALTH SECTOR

Primary care research is generally conducted through medical schools, with involvement of PHOs in recruitment, carrying out research procedures, patient management and data gathering. Other than the largest PHOs (such as Pegasus and ProCare), few have the capacity to undertake significant research projects. The primary care sector is very fragmented with several PHOs in any district (with the exception of Pegasus, which is the dominant PHO for Canterbury and has links with the DHB and universities), and concentrated on funding issues and providing services to their members. The Royal College of General Practitioners has recently developed a research strategy⁴⁵ which includes plans for supporting practice-relevant primary care research.

There are a number of community researchers working for a range of agencies involved with research, development and evaluation for community health organisations such as Māori health services and NGOs.

6.5 INDEPENDENT MEDICAL RESEARCH ORGANISATIONS

There are a small number of independent medical research organisations, each with its own area of research specialisation.

The Malaghan Institute of Medical Research⁴⁶ is an independent biomedical research institute, hosted by Victoria University in Wellington. Its main research areas are in cancer immunotherapy, therapeutic vaccines, asthma, infectious diseases, multiple sclerosis and arthritis.

The Medical Research Institute of New Zealand (MRINZ)⁴⁷ is an independent medical research organisation based in Wellington. It conducts research in alcohol and drug abuse, asthma and COPD, pharamcovigilance, Māori and Pacific health, public health policy, rehabilitation/stroke, and venous thromboembolism. MRINZ receives funding from a range of public, private and NGO sources, plus donations and bequests.

The Donald Beasley Institute in Dunedin⁴⁸ is a charitable trust which promotes and undertakes research in the area of intellectual disability. The Institute has conducted a diverse range of research over the past 15 years including work in the areas of family experiences and issues, deinstitutionalisation, legal issues, health

⁴⁵ <http://www.rnzcgp.org.nz/college-research/>

⁴⁶ <http://www.malaghan.org.nz/> accessed September 2008

⁴⁷ <http://www.mrinz.ac.nz/index.htm> accessed October 2008

⁴⁸ <http://www.donaldbeasley.org.nz> accessed October 2008

and well-being of adults with an intellectual disability, intimate and personal care for adults with high support needs, and community participation.

Te Pou, the National Centre of Mental Health Research, Information and Workforce Development ⁴⁹, is a company set up by the WISE Trust, taking on several functions related to mental health workforce and research previously undertaken by the HRC. It undertakes mental health research, has a role in mental health research workforce development, manages research funding for the MoH, and acts as a focal point for information to support local mental health services and outcome measures.

6.6 CENTRAL GOVERNMENT AGENCIES

Health and Disability Intelligence Group – Ministry of Health

The Health and Disability Intelligence Group (HDI)⁵⁰ within the Ministry of Health undertakes a range of research to support MOH strategy and policy development⁵¹. HDI's functions include:

- continually developing an evidence-base to underpin the strategy and policy development in MOH
- contributing to MOH's statutory responsibility to monitor the health of New Zealand's population
- commissioning and evaluating research to underpin policy and practice in health, healthcare and disability services
- working across government to use science and innovation to deliver improvements in, and monitor, health
- analysis of patient and public expectations and satisfaction, usage and attitudes.

6.7 PRIVATE HEALTH RESEARCH COMPANIES

There are now three medical research companies/trusts conducting early phase clinical trials for pharmaceutical companies in New Zealand. While the scope of most of their research is outside this landscape report, they are becoming significant players in medical research.

Christchurch Clinical Studies Trust⁵² (established in 1999) and **Auckland Clinical Studies Ltd** ⁵³ (established 2007) are closely linked organisations which carry out phase 1 and 2 clinical trials for the pharmaceutical and biotechnology industries.

⁴⁹ <http://www.tepou.co.nz>

⁵⁰ Formerly Public Health Intelligence (PHI)

⁵¹ <http://www.moh.govt.nz/phi>

⁵² <http://www.ccst.co.nz>

⁵³ <http://www.clinicalstudies.co.nz>

P3 Research Ltd ⁵⁴ is a medical research company which conducts Phase 2 and phase three clinical trials from its facilities in Wellington and Tauranga. P3 has a close association with the Medical Research Institute of New Zealand.

A number of other research and evaluation companies carry out contract research and service evaluations for health sector agencies, for instance in primary care, health promotion, Māori health, and local health projects research and evaluation.

⁵⁴ <http://www.p3research.co.nz>

7 Health Delivery Research Capacity

Further information on the landscape for health delivery research can be obtained from ethics and workforce data collected by agencies with funding and monitoring responsibilities. A summary follows.

7.1 RESEARCH ETHICS APPLICATIONS

All health research involving human subjects, health information or human tissues needs approval from an ethics committee, so the research ethics applications provide a useful list of health delivery research carried out in the country⁵⁵. Ethics committee summary information, held by MoH, identifies the research topics, the type of research, investigators, research organisations and funding sources.

In 2007, some 1106 applications were made to HRC-accredited ethics committees. Of these, 982 were approved or had received conditional approval, 35 were declined or withdrawn, decisions on 12 had been deferred beyond the end of the year because of significant concerns from the ethics committees and 68 did not need ethics committee approval.

Of the 982 approved applications, 144 (14.7%) were clinical trials sponsored by a pharmaceutical or medical device company, with another 404 (41.1%) being clinical trials or studies involving human subjects funded from other sources. The remaining 434 (45.5%) covered research on clinical research other than clinical trials (e.g. on disease mechanisms), health information, health services, epidemiology, surveys, audits and student research⁵⁶. Most of the health delivery research would have occurred in the first two groups – sponsored research and clinical trials/studies.

Over 250 sources of funding were utilised, commonly in combination, among them 97 companies, the HRC (24 projects or grants, plus several pending applications), internal DHB and university sources, and 60 charitable trusts. The Australian NHMRC funded five projects.

Most companies and charities funded only one or two projects which required ethics approval. Around 70% of projects could fall within the scope of health delivery research⁵⁷.

⁵⁵ Some research areas are under-represented as they do not require ethics committee approval. Biomedical research not involving human subjects does not need regional ethics committee approval. Much health services and systems research does not directly involve human subjects or health information. Similarly epidemiological research and health needs assessment and policy-related research often uses population and demographic data, publicly available information (such as birth and death records), or statistical information from health services (e.g. health service utilisation data) which do not need ethics committee approval.

⁵⁶ These figures relate to the research's status over compensation with ACC.

⁵⁷ From a sample of around 500 projects – only the project title is provided, so this may not be accurate, but is indicative.

7.2 HEALTH RESEARCH WORKFORCE

Most health researchers rely on research grants to support some or all of their salary. Data on researcher full time equivalents (FTEs) working on HRC funded contracts are shown in Table 7.1.

Table 7.1. Total FTE researchers working on HRC funded contracts in each HRC Research Portfolio for 2003 and 2007

HRC Research portfolio	FTEs in 2003	FTEs in 2007
Biological systems and technologies	45	118
Communicable diseases	22	10
Determinants of health	21	40
Health and disability sector management and services	14	13
Health and independence of population groups	28	18
Injury impairment rehabilitation and disability	17	20
Mental health and neurological disorders	66	34
Non-communicable diseases	95	113
Rangahau Hauora Māori	19	25
Total	327	391

While the total number of researcher FTEs funded by the HRC has increased, there have been significant shifts within this, including increases in those working in the Biological Systems and Technologies area (low relevance to health delivery), Non-communicable Disease research and Determinants of Health. Meanwhile, numbers working in Mental Health and Neurological Disorders have halved. It is difficult to draw conclusions from this data about the actual numbers and any trends related to health delivery research workforce. Tentatively though it would indicate no significant change in health delivery research workforce FTEs over the time period 2003–2007.

Within these numbers, however, clinical academics (with joint clinical and university appointments) working on HRC funded projects have increased from 21 to 36 FTEs (151 to 273 individuals) between 2003 and 2007. Clinical academics are now the second largest HRC workforce category (after academics), making up 21% of the workforce. These individuals can be expected to be involved in health delivery research and the data also tell us that they are as a group very much ‘part-time’ researchers, most with only a ‘few-tenths’ of their time allocated for research.

For the Health and Disability Sector Management and Services portfolio, the actual FTEs and number of individuals working on contracts was similar in 2003 and 2007; however the proportion of individuals who contributed 'time only' FTEs was 16% in 2003 compared with 47% in 2007. Since the introduction of the Performance Based Research Fund, the HRC has observed a trend across all portfolios towards a higher number of individuals named on contracts, with smaller FTEs on average and more 'time only' contributions.

The Health and Disability Sector Management and Services portfolio has the highest proportion of senior researchers. The Universities of Otago, Auckland and Victoria have expressed concerns about their ability to retain and recruit promising researchers and senior researchers in this area because of the relatively low levels of funding here and the difficulty in obtaining funding, compared with elsewhere. The difficulties are compounded by the fact that many people working in health services research are not in academic teaching positions and are on fixed term contracts.

8 Infrastructure Support For Health Delivery Research

8.1 RESEARCH SKILLS TRAINING AND DEVELOPMENT

While universities involved in health research offer training in research methodology and Good Clinical Research Practice (GCRP), capacity and capability of the wider health workforce to run research is limited, especially in the clinical research area. Methodological and statistical advice is commonly not sought, undermining research validity. There have been instances where researchers have got into serious difficulties because of contractual, financial, administrative or ethical problems, or have not followed Medsafe or international GCRP guidelines. The metropolitan DHBs have research offices which can provide or facilitate training, for example in GCRP, but this could usefully be expanded.

New Zealand Association for Clinical Research (NZACRes)⁵⁸ is a professional association for people involved in all aspects of the conduct of clinical research. It is a constituent organisation of the Royal Society of New Zealand. It runs the annual Clinical Research Conference and organises regular meetings around the country on various research related topics and researcher networking. The website also gives links to research training opportunities, such as in GCRP. The Health Services Research Association of Australia and New Zealand promotes health services research in New Zealand and Australia, including training⁵⁹.

8.2 ADMINISTRATION AND INSTITUTIONAL PROCESSES AND INFRASTRUCTURE

Health research, especially clinical trials, often needs substantial administrative and logistical support, and should always have an oversight process. This will generally include:

- institutional review and approval processes
- contracting, financial management and accountability processes
- indemnity and liability arrangements
- intellectual property arrangements
- trained research staff and administrative support
- research facilities, equipment and services (e.g. laboratory, radiology, clinical records, data entry, IT)
- statistical support.

Pharmaceutical and medical product trials must meet stringent requirements as part of gaining approval from regulators. The universities have these processes in place, and most metropolitan DHBs have research departments or agencies which handle these matters routinely, to varying degrees. Over the last few years DHB

⁵⁸ www.nzacres.org.nz

⁵⁹ www.chere.uts.edu.au/hsraanz,

research offices have developed stronger linkages with each other and are hoping to develop this into an online forum for exchanging best practice.

Institutional approval processes can be complicated, particularly if several funders and research institutions are involved (e.g. clinical research undertaken by a university department and involving several DHBs, will need approval from each, including appropriate consultation with Māori and affected communities, prior to ethics committee approval). Each process is likely to need separate application forms, involving much duplication. Simplification of these processes would be beneficial.

Issues related to liability and indemnity issues for DHBs or other research organisations are particularly complex. Indemnity cover is required by ethics committees but there is a lack of clarity about the extent of liability carried by DHB staff who may be involved in trials and the cover provided through standard practitioner-based indemnity arrangements. Counties-Manukau DHB have commenced work to clarify the indemnity and compensation arrangements and are also supporting coordinated work across DHB research offices toward a nationally agreed indemnity and compensation agreement.

Another dimension to infrastructure relates to the national data sets that underpin a significant amount of health research. The access and maintenance of these data sets are a key cost, yet they also represent an area where New Zealand has strengths (e.g. with our national health index system) and where there is opportunity for further gains, through research, to support evidence-informed practice and policy.

8.3 ETHICS APPROVAL PROCESSES

All health research involving human subjects requires approval from an ethics committee. Six Regional Health and Disability Ethics Committees, the Multi-region Ethics Committee and the Ethics Committee on Assisted Human Reproduction are accredited by the HRC, and administered through MoH⁶⁰. Universities and some other research agencies have institutional ethics committees.

The HRC accredits ethics committees as part of international regulatory requirements. All pharmaceutical and medical device research requires approval from one of these committees to be acceptable for use in product registration in the United States, European Union, and elsewhere.

The process for applying for ethical approval has been simplified in the last two years, and further clarification is expected. For straight-forward or thorough proposals, approval can take as little as four weeks, although more contentious or problematic proposals can take several months. The most serious problems

⁶⁰ See <http://www.ethicscommittees.health.govt.nz> for details of ethics committee roles and criteria. Accessed October 2008.

concern: methodology and statistical analysis; inadequate compensation provisions for sponsored pharmaceutical trials; inadequate consultation with Māori and participant communities; and the quality of participant information needed prior to informed consent.

The HRC has its own ethics committee which, among other roles, provides second opinions on research applications declined by the regional committees.

The National Ethics Advisory Committee advises the Minister on ethical issues, but is not involved in reviewing research proposals.

Universities have health ethics committees which consider medical research proposals not requiring approval by the Regional Ethics Committees. DHBs have ethical advisory committees or their equivalent, mainly considering clinical ethical issues and new treatments, but generally not research.

8.4 EVALUATION AND AUDIT

The capacity and funding for evaluation and audit of research in New Zealand is very limited. Peer review of research results submitted for publication, while useful, is not a sufficient substitute. Pharmaceutical companies need to undertake audits as part of GCRP and their regulatory requirements. Ethics committees should be undertaking or commissioning audits of research as part of regulatory approval processes for pharmaceutical trials. However, this is rare, generally occurring only when problems become known.

8.5 COMPENSATION ENVIRONMENT

New Zealand's relatively well-developed health services and limited requirements for compensation for harm suffered by drug trial participants under the Researched Medicine Industry Association of New Zealand (RMI) Guidelines make New Zealand a relatively low risk country for pharmaceutical research.

9 Current Issues in Health Delivery Research

This section records issues and comments gathered through the interviews conducted by David Sinclair (Sinclair Taylor Consulting) for this project.

9.1 FUNDING AND PRIORITIES

New Zealand's funding for research, including health research, is comparatively low among OECD countries⁶¹. Government financed Gross Expenditure on Research and Development was 0.5% of GDP in 2005/6 compared with the OECD average of 0.66%. Similarly, business research funding is below the OECD average. New Zealand's per capita GDP is also relatively low, compounding the situation, and the effects of these gaps accumulate over time.

New Zealand's government funding per capita for health research is reported to be around one third of that in Australia, one fifth of that in the UK and one tenth of that in the USA⁶². New Zealand's charitable sector funding is also much smaller than elsewhere.

Many research agencies see HRC funding as problematic because of the low success rate and high costs of preparing proposals. Some researchers report that it is not uncommon for them to spend as much as half of their time on funding applications, with low returns.

Consequently, health research in New Zealand is at risk of continuing to lose experienced high quality researchers because of rising costs of training and retaining researchers, purchasing equipment, and running research projects, compared with the relatively high salaries and more reliable funding streams elsewhere. Reducing levels of research would have flow on effects in clinical training and health service quality, and into the wider community and economy.

Research priorities continually need to be revised, including the relative balance between research oriented towards New Zealand-specific health problems, and our participation in international research and development. Several research agencies raised the issue of who is the appropriate funder for research on specific topics, which may be of importance in terms of the New Zealand Health Strategy but which would rank relatively low in the HRC assessment process for the contestable round. They advised that some areas of research which are of practical and immediate benefit but may not have a high scientific profile need to be funded directly and reliably from the Ministry of Health. While the research funding

⁶¹ For example, as noted in OECD Reviews of Innovation Policy: New Zealand, 2007. Paris, OECD. <http://213.253.134.43/oecd/pdfs/browseit/9207071E.PDF>

⁶² Joyce PR, Reid IR. Health research funding: international comparisons with New Zealand. NZMJ 2008 121; 1280: 7.

partnerships and joint ventures cover some of these topics, there are many others outside their scope.

There is a long-standing debate in health research about the relative weight that should be given to research on new or promising pharmaceuticals and technologies which may bring benefit to a small number of people, often in the late stages of life, compared with research aimed at benefiting a larger proportion of the population, or preventing illness. Much of this debate relates to the proportion of research funding for pharmaceuticals and the role of government support. On one side, major technological and pharmaceutical innovation has without doubt brought benefit. However, some of the most effective health interventions have been low cost, and so attract little research funding. Some promising areas, such as biotechnology, have been limited in their results, but attract significant funding.

Public funding agencies in particular need to be weighing the overall health benefit for their population with the narrower scientific merit of research.

9.2 APPLICATION OF RESEARCH TO CLINICAL PRACTICE, HEALTH SERVICES AND POLICY

What research can show to be effective is often well in advance of actual clinical practice and health services organisation. This gap is often wide, and difficult to bridge. This international problem is widely acknowledged, exists also in New Zealand, but efforts to narrow the gap have only been partly effective.

The completion and publication of research only gets us to the starting line for effective implementation of innovation. The process of changing practice, developing new programmes or organisational change is long and complex.

Rogers' widely cited theory of innovation diffusion⁶³ proposes that change occurs over time through five iterative stages: knowledge, persuasion, decision, implementation and confirmation. Most research only addresses the first stage.

Internationally, there are many initiatives to improve practice and encourage adoption of effective innovation. The Cochrane Collaboration, which undertakes systematic reviews of research evidence, is widely known. The UK's National Institute for Health and Clinical Excellence⁶⁴ produces guidance and implementation tools supporting quality practice. The US-based Institute for Healthcare Improvement⁶⁵ seeks to accelerate adoption of good practice.

In New Zealand, the Guidelines Group⁶⁶ seeks to develop a culture of evidence-based practice in New Zealand. BPAC^{NZ}⁶⁷ is a company spun off from the University of Otago to support continuing medical education for GPs, producing

⁶³ Fagerberg J, Mowrey D, Nelson R (2006). The Oxford Handbook of Innovation. Oxford, OUP.

⁶⁴ www.nice.org.uk

⁶⁵ www.ihl.org

⁶⁶ www.nzgg.org.nz

⁶⁷ www.bpac.org.nz

evidence based reviews. It is funded by PHARMAC and DHBNZ. The Ministry of Health has an innovation website for the National Service & Technology Review Advisory Committee⁶⁸.

Producing evidence for best practice in itself is ineffective in producing change. It is relatively passive, and should be followed by active processes for clinical education and training, organisational learning and systems changes, and policy, planning and funding. Contractual or regulatory backing may be useful. Involvement in research may encourage people to become innovators or early adopters for other innovation, and develop their practice towards seeking improvement.

9.3 SUPPORT FOR RESEARCH WITHIN DHB SERVICES

This issue was raised by several researchers and research offices within DHBs. Staff involvement in research is commonly not regarded as a legitimate or worthwhile activity by health service managers, in part because DHB core funding cannot be used for research, so research becomes a drain on hospital departments. Research or staff involvement in generating evidence-based practice is often not part of the culture of health services, especially when services are under pressure, or research is not well funded or where there is no capacity for back-filling for clinical staff undertaking research. Some university informants noted a decline in research-based Masters qualifications in favour of further papers, with research-based qualifications becoming less valued by employers.

However, the value of clinical research within health services is not just from the research projects themselves, but also in the way taking part in research changes practitioners' use of research results and evidence for practice. Legitimising research could result in other spin-offs for service quality and effectiveness. Various ways of overcoming this barrier have been proposed, including clinical researcher positions, and explicit allowances for research within clinical staff employment contracts, but would be dependent on funding.

9.4 LOW PRIORITY/CAPACITY RESEARCH AREAS WITH HIGH POTENTIAL GAIN

A perennial issue is that of the relatively low level of funding and research capacity in areas of low priority to funders, but potential high gain in improved health or disability status or service effectiveness and quality. The funding disparity between pharmaceutical trials and other clinical research, health services research, disability and rehabilitation research is substantial. There are substantial gaps in knowledge, and the type of research needed is unlikely to be able to compete successfully in the HRC's contestable funding round. The HRC and MoH have other funding streams, but the potential for research is much greater than this funding allows.

⁶⁸ www.moh.govt.nz/moh.nsf/indexmh/nstr-horizonsscanning

These sectors are likely to have limited capacity for undertaking research and turning results into practice, in comparison with, for example, teaching hospital departments which are involved in research programmes.

9.5 PLACE OF RESEARCH IN IMPROVING SERVICES AND PRACTICE

There is no shortage of research ideas and people interested in conducting research. The main constraints on conducting health delivery research are funding, research skills, and the ability of health services to support research activities while maintaining clinical services.

In many situations, the most valuable and innovative research is that originating from the need to tackle local practical problems. Research becomes a useful part of the iterative process of identifying issues, developing solutions, implementing them and evaluation. Such research is driven by the underlying practical question, rather than being initiated by researchers, many who do not have a continuing commitment to the host service.

There can be significant barriers to integration between practice and research, because of funding, lack of research capabilities or other management priorities. The value of having people who have been researchers on staff should be promoted by senior managers as a way of assisting improved practice and services. This may be more difficult in areas where there are few researchers, such as residential care and community or ambulatory services.

Joint appointments for clinical researchers were seen by several informants as a useful means of boosting research and benefiting from the spin-offs of having staff interested in answering practical questions and improving services. A key need for such appointments would be to ensure that they are resident in the hospital (or other health service) and have the resources to lead and foster research in the healthcare environment.

9.6 COMMERCIAL APPLICATION OF HEALTH INNOVATION RESEARCH

New Zealand companies' capacity to conduct trials is limited. While their expertise is in developing new ideas and products, most companies have limited understanding or experience of how to progress their innovation through the clinical trial and regulatory processes for product approval in major markets, especially the United States (FDA) and European Union.

Several university, DHB and research companies have this capability, but need expansion to allow more technological innovation to progress to production.

New Zealand's limited production capacity, distance from major markets and access to venture capital, limits the options for companies to commercialise their innovations and up-scale production here.

Annex 1: List of People Interviewed

The following people provided valuable information, comment and insight for this project.

Max Abbott and Geoff Dickson, AUT

Frances Blyth, TEC

Michele Coleman, University of Otago

Sally Cook, National Coordinator, Ethics Committees

Jackie Cumming, Health Services Research Centre, Victoria University

DHB Research Fund Governance Group

Jackie Fawcett, ACC

Aroha Haggie, Tania Pocock, Sharon McCook, Megan Wilmott and Fiona McFarlane, HRC

Craig Holmes, Foundation for Research, Science and Technology

Gary Jackson, Funding and Planning, Counties Manukau DHB and DHB Research Fund Governance Group

Samantha Jones, Auckland DHB Research Office

Ross Lawrenson, Waikato Clinical School

Mary-Jane McCarthy and Steven Lungley, Ministry of Health

Wayne Miles, Knowledge Centre, Waitemata DHB

Val Orchard, ESR

Megan Putterill, Uniservices, University of Auckland

Alison Robertson, Counties Manukau DHB Research Office

Anthony Rogers, Clinical Trials Research Unit, University of Auckland

Stuart Ryan, CCREP (CMDHB)

Jenny Steven, Consultant

Ian Town, University of Canterbury

Gerard Vaughan, ALAC

Alistair Woodward, School of Population Health, University of Auckland

Annex 2: Notes on Methodology and Classification of Health Delivery Research

The following table indicates the types of research included and not included with the scope of health delivery research for the purposes of this report. Examples of HRC-funded contracts are included as footnotes.

Research Category	Research included as health delivery	Research not included
Biomedical		
Gene		Not covered in Landscape
Cell Biology		Not covered in Landscape
Physiology		Not covered in Landscape
Diagnostics	Clinical trials of new diagnostic methods New diagnostic methods developed in New Zealand (1)	
Pharmaceuticals/ treatments	New pharmaceuticals and treatments developed in New Zealand to the stage beyond laboratory development.	Pharmaceutical and technological development, pre-clinical trials and Phase 1 and 2 trials are not covered [unless from NZ developments].
Clinical Research		
Clinical studies	Research involving human subjects, where the primary aim is to improve treatment, clinical practice or safety (2)	Research involving human subjects, but not aimed at improving treatment, clinical practice or safety
Clinical trials	Phase 3 and 4 clinical trials for pharmaceuticals, technologies and devices Clinical trials of new or improved treatment methods, comparison of treatment, clinical practice, or services (3) Phase 1 and 2 clinical trials of innovations developed in New Zealand	Phase 1 and 2 clinical trials for international pharmaceuticals and devices are not included

Health Services	Research included as health delivery	Research not included
Health economics	Research on the cost-effectiveness of treatment or services (4)	
Clinical services	<p>Research on primary, secondary and tertiary medical services and disability services, including delivery, management, access, quality, appropriateness, safety etc (5)</p> <p>Health systems research (e.g. on health systems organisation, policy or funding)</p> <p>Information technology and management research where this is directly related to innovation in clinical practice or services (6)</p>	
Public Health		
Knowledge resources	Epidemiological and social science research primarily aimed at improving health and disability policy, services and programmes (7)	<p>Epidemiological research on disease causation and risk factors which isn't linked to specific innovations or service improvement initiatives</p> <p>Social science research (including social epidemiology) which isn't linked to specific innovations or service improvements or public policy</p> <p>Development of new methods and tools and indicators (8)</p>
Risk Factors	Research aimed at identifying ways of reducing risk factors, linked to specific innovations or service improvement (9)	Epidemiological and social science research on disease causation and risk factors which isn't linked to specific innovations or service improvement initiatives (10)

	Research included as health delivery	Research not included
At-risk populations	Research primarily aimed at improving the health and disability status of specific population groups (based on age, ethnicity, occupation etc), and related health and disability policy, programmes and services (11)	Research on at risk populations not directly related to improving health and disability status or services.
Interventions	Research on the design and evaluation of community- or population-level interventions (12)	
Community services	Research on community-run services and community groups (13)	

(1) 07/114

BNP signal peptide: a novel, specific marker of acute cardiac injury

Dr Chris Pemberton

Early clinical detection of acute coronary syndromes (ACS) can be difficult. In particular, distinction between cardiac and non-cardiac events may entail 12–36 hours of delay whilst serial biomarker results are awaited and/or subsequent tests (such as exercise electrocardiography) are performed. We have achieved the first ever identification of a signal peptide in the circulation (B-type Natriuretic Peptide signal peptide (BNP-SP)) and show that it has potential to specifically and rapidly identify cardiac ischemia. Using specific immunoassay, peptide sequencing, mass spectrometry, high performance liquid chromatography and ex vivo (isolated heart) and in vivo (ovine) experiments, we will characterise the experimental biochemistry and physiology of BNP-SP. In the clinic, we will measure serial BNP-SP concentrations in patients with clear documented myocardial infarction and in a larger "all comers" group of patients with chest pain. This research has the potential to speed up diagnosis and ultimately improve outcomes for patients with ACS.

(2) 06/063A

Long-term functional and neuropsychological outcomes after stroke in New Zealand

Associate Professor Valery Feigin

Data on incidence, case fatality, disability and quality of life have been collected in all 3 previous Auckland Regional Community Stroke (ARCOS) studies (1981–1982, 1991–1992, and 2002–2003), however none have included information on 'neuropsychological outcomes' such as memory, attention and reasoning skills. Further, only the latest and largest study reliably differentiated between different pathological types of stroke. This study will follow-up stroke survivors registered in 2002–2003, measuring neuropsychological outcomes with different stroke types. If

our hypothesis of the significance of impairments on neuropsychological outcomes after stroke is substantiated, this will provide a new direction for rehabilitation efforts in stroke which have traditionally focused solely on motor functioning (particularly walking), language and activities of daily living. The study will also investigate the long-term handicap and disability outcomes, direct and indirect costs of stroke, role of the health of caregivers on outcomes in stroke survivors and provide a focus for intervention efforts in future studies.

(3) 08/158

Interventional Study on Bronchiectasis in Indigenous Children

Dr Catherine Byrnes

Bronchiectasis (Bx) is a type of irreversible lung scarring caused by recurrent and/or prolonged respiratory infection. High rates have been recently documented in certain indigenous groups: New Zealand Māori and Pacific Island, Australian Aboriginal and Alaskan First Nation children. An international collaboration between Alaska, Australia and New Zealand has developed to study an intervention with prolonged antibiotics. Azithromycin has anti-inflammatory and antibiotic properties, as well as direct effects on mucus. It has been effective in improving outcomes in cystic fibrosis (a similar disorder seen predominately in European cultures) but currently remains unavailable to our population with Bx. This multicentre, double-blind, randomised parallel study will follow children on placebo or azithromycin for two years monitoring clinical outcomes of their Bx disease. If this results in benefit, it will reduce morbidity and extend the lives of children with Bx from these indigenous groups. NB: No drug company involvement in study.

(4) 08/089C

Improving Health Systems Performance: Enhancing Hospital Outcomes

Professor Peter Davis

Investment in health has doubled over the last decade and much of that has been absorbed in the hospital sector. Have we got value for that increase in investment, as judged by throughput, output and quality of care? This is what the current project is designed to assess. It will do so by using existing information sources from the New Zealand Health Information Service. It will increase the utility of this information by electronically and confidentially linking the core hospital file to other data sources. In this way, the research will maximise the gain that can be derived from otherwise disconnected repositories of information. The study will influence health outcomes both directly – through the potential for the improvement of the quality of care – and indirectly – through contributing hard evidence on the productivity and effectiveness of investment in hospital and related services.

(5) 08/218

Understanding diabetes management: tracking communication in primary care

Professor Tony Dowell

Diabetes is a major cause of morbidity and its management involves complex pathways of consultation and communication, which are imperfectly understood. This research will track a series of newly diagnosed patients with diabetes in their interactions with health services for a period of approximately six months. Data will include video/audio recordings of patient interactions with health professionals (eg GP, nurses, dietician), medical records, interviews, logs, and field observations. The analysis will use qualitative methods including ethnography and interaction analysis to identify and explore effective communication in diabetes care. As a result primary healthcare teams will gain a better understanding of communication processes and information flows in diabetes. A professional development 'toolkit' for effective diabetes communication ('Communication on Diabetes: Education Toolkit') will be produced, building on the known importance of quality of communication between health practitioners and patients on health outcomes.

(6) 08/584

Improving the analysis of product vigilance databases

Dr Patrick Graham

This research proposal concerns the development of statistical methods for the analysis of product vigilance databases. These databases record adverse reactions to medicines and herbal products. In New Zealand the most extensive database of this sort is the database of the Centre for Adverse Reactions Monitoring. We propose to use this database to, firstly, check that methods for modelling product vigilance data that have been developed internationally can be applied to the New Zealand database which is smaller than has been analysed elsewhere, and, secondly, to extend existing methods of analysis of product vigilance data using modern statistical and computational methods.

(7) 05/086

Exploring the housing needs and experiences of people with disability in New Zealand

Professor Philippa Howden-Chapman

The geography, housing locations and housing stock of New Zealand have implications for health, well-being and independence of people with disability. This study aims to explore housing experiences of people with lower limb amputations. The principal research methodology is qualitative, involving in-depth interviews with people with amputation, their housing providers and those who assist people with disability to gain housing appropriate to individual need. In the context of people with disabilities the objectives are to explore: (a) issues around availability and choice of accessible housing; (b) the housing experiences of people with disability due to disease and those with disability due to injury; (c) the role of public agencies in assisting people to have their housing needs met; (d) the response of housing providers. The outcomes of this study will be to identify: (a) potential policy implications of these experiences; (b) possible interventions designed to improve housing accessibility.

(8) 05/519

Identifying key indicators of well-being for young New Zealanders

Dr Paul Jose

The proposed research project will identify key wellbeing indicators for youth aged 16 to 24 years from diverse geographical areas and key ethnic groups (Pakeha/NZ European, Māori and Pasifika). Focus groups and interviews will be utilised to obtain information from participants about concepts of well-being and potential indicators.

(9) 06/448

Can a multimedia mobile phone programme help young people stop smoking?

Dr Robyn Whittaker

Many young people want to quit smoking. However, few use existing stop smoking programmes. Mobile phone-based programmes are inexpensive, personalised, and can reach virtually anyone at any time or place. However there is uncertainty about their long-term effectiveness and the potential benefits from video-capable phones. In this trial, young smokers who want to quit will be randomly assigned to receive a novel personalised video-based stop smoking programme via their mobile phones, or to a control group. The programme includes video role modelling by peers sharing their experiences of quitting, and videos on request to combat cravings. Participants will submit their own videos and video diaries, and be encouraged to engage with others via the programme. If this intervention is successful, there is considerable potential for widespread uptake and expansion to other major youth health issues; since almost all young adults will have video-capable phones within a few years.

(10) 08/342

The Dunedin Next Generation Studies

Associate Professor Robert Hancox

This project builds on the long-running and highly successful Dunedin Multidisciplinary Health and Development Study. Approximately 1000 participants in this study have been followed since their birth in 1972/73. A great deal of information about these individuals has been collected and has been very informative on early life events, health and development. In addition we now have information on the health and lives of approximately 8000 family members including siblings, parents and grandparents. This project extends this work by studying the children of the study members when they are age 3 and age 15. We seek to understand how parenting roles are influenced by the upbringing, social circumstances and lifestyle of the study members and how the risk for mental and physical health and behavioural problems are passed between three generations of New Zealanders. We further aim to identify factors that protect against intergenerational cycles of adversity.

(11) 08/215

Exploring Samoan women's attitudes towards antenatal and midwifery care

Dr Ausaga Faasalele Tanuvasa

Despite the availability of midwifery services, Pacific women continue to attend antenatal care only late in pregnancy, resulting in complications during birth and higher than desirable rates of infant morbidity and mortality. A scoping exercise found differences between New Zealand-born and Pacific-born women in their experiences of antenatal and midwifery care. This research aims to explore, in depth, the attitudes of Samoan women towards antenatal and midwifery care in order to identify the barriers and opportunities within midwifery services for appropriate services when working with Samoan women. This qualitative study will include: (i) 60 in-depth interviews to examine and compare the attitudes of Samoan-born to New Zealand-born women towards existing services; and (ii) 20 key informant interviews with midwives and other health professionals.

The findings will help inform midwifery service strategies to improve the health of Pacific women and children. The research will also enhance Pacific research capacity.

(12) 07/383

Feasibility of traffic light labels to signpost food choices in supermarkets

Dr Cliona Ni Mhurchu

Healthy eating is essential to prevent heart disease, stroke, diabetes, cancer and many other major health issues in New Zealand. Nutrition labels aim to inform consumers about the nutrient value of foods and to guide food choices. Current labelling systems are not understood by many, and one format increasingly recommended is 'traffic light' labelling (green = healthier choice, amber = OK choice, red = less healthy choice). Our proposed research will provide important information on a promising nutrition labelling intervention and the feasibility of a large trial to measure its effectiveness. Specific objectives include (1) evaluating consumer preferences and understanding of two traffic light systems (simple or multiple), and effective ways to promote them; (2) working out how different foods should be classified; (3) engaging with stakeholders regarding implementation; (4) assessing differences in cost and availability of healthier foods as classified with the new systems; and (5) a pilot to assess practicalities related to implementation of the intervention.

(13) 06/499

Examination of the outcomes of resettlement of residents from Kimberly Centre:

Phase 2

Associate Professor Anne Bray

This research represents Phase 2 of a study designed to examine the resettlement of residents from Kimberley Centre. In Phase 1 data were collected from families and staff about residents' living in Kimberley Centre. Residents were also observed and information was gathered about quality of life and adaptive behaviour. Phase 2 is designed to repeat these data collection strategies with families, staff and residents in community-based services.

Glossary

Frascati definitions of research

The OECD Frascati Manual 2002, provides the research type classifications used in government surveys of R&D, which define the following terms:

Research and Development (R&D): Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of [people], culture and society, and the use of this stock of knowledge to devise new applications. It involves original investigation to gain knowledge that is new to the world. The new knowledge may (or may not) have a specific practical application.

Basic research: Basic research is carried out for the advancement of knowledge, without seeking long-term economic or social benefits or making any effort to apply the results to sectors responsible for their application.

Targeted basic research: Targeted basic research is research to produce a broad base of new knowledge likely to underpin solutions to current or future applications.

Applied research: Applied research is also investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development: Experimental development is systematic work, drawing on knowledge gained from research and practical experience that is directed at producing new materials, products and devices; installing new processes, systems and services; or improving substantially those already produced or installed.

Translational health research

The term ‘translational research’ describes the basic and applied research necessary to enable successful application of research-generated health solutions. Internationally, translational research is generally focussed on the development and clinical trials of new pharmaceuticals and medical technologies. However, in New Zealand the HRC uses a broader definition of translational research: ‘Translational research is the scientific investigation of interventions aimed to accelerate the uptake and use of evidence-based observations and practices to improve health services, operational, public health and policy-level decision making. Translational research begins with the identification of a clinical, health service or policy-related problem and ends with the successful application of a research generated solution. Translational research occurs in two continuous phases and moves in both directions along the bench-to-bedside and bench-to-policy continuum.’

In addition to scientific merit and research priorities, the HRC’s research funding assessment criteria gives a priority weighting to translational research. To qualify as translational research (for HRC funding), all five of the following criteria must be satisfied:

- The research proposal is laboratory based, either a dry or wet (laboratory) or community based
- The research proposal is a clinical trial or an intervention or is observational research aimed at informing policy
- The research proposal demonstrates sustained engagement of stakeholders/end-users from the outset e.g. patient or community
- The research proposal has the intent of application or uptake, i.e. demonstrated translatability. This needs to be clearly stated and identified within the research proposal
- Timeliness (the research is likely to be translated/taken up in the short to medium term).