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## Healthier Lives for All New Zealanders:

Evidence for equitable health outcomes in Aotearoa New Zealand

## He Oranga Hauora Ake mō ngā Tāngata Katoa o Aotearoa:

He taunakitanga mō ngā putanga hauora tōkeke i Aotearoa

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Jim Mann, Cliona Ni Mhurchu, Andrew Sporle,  
Parry Guilford, Jean Cockram, Cherie Stayner



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Inside front cover images: Healthier Lives whānau, 2016-2024, including Members of the Governance Group and Kāhui Māori, Science Leadership Team, researchers and kaupapa partners. Photos by Sharron Bennett and Luke Pilkinton-Ching.

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HEALTHIER  
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He Oranga Hauora

National  
**Science**  
Challenges

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Equitable health outcomes

Treaty partnership and Vision Mātauranga

Co-design with next and end users

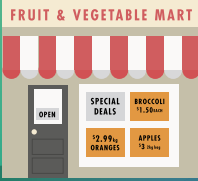
CROSS-CUTTING PRINCIPLES

Equitable health outcomes

CROSS-CUTTING PRINCIPLES

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Healthy food and physical activity environments



Culturally centred health interventions for Māori and Pacific peoples



Precision medicine





## Introduction

The Healthier Lives–He Oranga Hauora National Science Challenge (Healthier Lives) was established by the New Zealand Government in 2015 as one of 11 national science challenges (NSCs) formed to undertake a nine-year collaborative research programme focused on issues of strategic importance to Aotearoa New Zealand.

### Objective and vision

The Government set Healthier Lives the objective ‘to reduce the burden of major New Zealand health problems’<sup>1</sup>. It specified that research should focus on equitable approaches for improving the prevention and treatment of four major non-communicable diseases that together account for more than a third of deaths and disability in New Zealand: cancer, cardiovascular disease, diabetes and obesity. Healthier Lives developed its own vision of ‘Aotearoa New Zealand with equitable health outcomes and a substantially reduced burden of non-communicable diseases’.<sup>2</sup>

The objective and vision were ambitious. Globally, the incidence of non-communicable diseases (NCDs) has grown steadily over the past 50 years to reach pandemic proportions. NCDs account for more than 70% of deaths and disability worldwide, and 89% of all deaths in Aotearoa. What’s more, the burden of NCDs is not borne equally across the New Zealand population; there are marked and ongoing ethnic and socioeconomic inequalities in their incidence and the number of deaths attributable to them.

### Healthier Lives 2019–2024 research strategy

NCDs are caused by a complex range of factors related to environment, genes and lifestyle, which intersect at societal, community, family and individual levels. While genetic factors play an important role, there is strong evidence that changes to diet and physical activity have great potential to reduce the risk of these seemingly intractable health problems.

The Healthier Lives 2019–2024 research strategy recognised three general approaches that could be used to reduce the burden of NCDs: population-level approaches, which are applied to everyone to help prevent disease; individualised approaches, in which treatment recommendations are tailored to fit individuals (or subgroups of individuals) according to their genetic background and disease risk; and community-focused approaches, which take into account the needs, aspirations and culture of Māori and Pacific communities.

In fact, all three approaches are needed simultaneously. Prevention of disease is achieved most effectively through population-level measures, such as taxing a harmful product like tobacco to reduce its use. The most effective approach for the treatment and management of many NCDs is precision medicine, which can indicate the best treatment options for an individual, based on their genetic characteristics for example. In Aotearoa New Zealand, a community-led and culturally engaged approach is imperative in order to achieve equitable health outcomes for Māori, and to acknowledge the country’s location in the Pacific region and the multicultural make-up of its population.

Achieving equitable health outcomes demands a multi-pronged approach: one that develops and evaluates not only prevention of disease and treatments tailored to individuals, whānau and communities, but also structural and systemic changes within the healthcare system and wider society that can bring wide-ranging health benefits.

1 *New Zealand Gazette*, 12 (31 January 2014): 295

2 *Healthier Lives 2019–2024 Research Strategy*: [https://healthierlives.co.nz/wp-content/uploads/HL-research-strategy-2019-24-booklet\\_web.pdf](https://healthierlives.co.nz/wp-content/uploads/HL-research-strategy-2019-24-booklet_web.pdf)

The Healthier Lives strategy focused research activities within three broad themes:

1. Healthy food and physical activity environments (population-level approaches)
2. Culturally engaged health programmes for Māori and Pacific communities (community or whānau ora approaches)<sup>3</sup>
3. Precision medicine (individualised approaches).

Three principles directed these research activities:

1. Achieving equitable health outcomes
2. Enacting a Treaty partnership and Vision Mātauranga<sup>4</sup>
3. Co-designing research with next and end users.

## Achieving change

With funding of \$31.3 million over nine years, Healthier Lives could not be expected to reduce a disease burden of the scale currently facing Aotearoa New Zealand. Such change requires action on many fronts and is beyond the control of one research programme.

To tackle NCDs as a country, in addition to research evidence we need: public recognition of the scale and scope of NCDs; action from government to address long-standing socioeconomic inequalities associated with poor health; resourcing within the health system to implement evidence-informed interventions; and political will to enact policy, taxation and regulatory approaches across a range of sectors (e.g. health, agriculture, transport, urban planning) for the prevention of NCDs.

Given the scale of this challenge and the resources available, Healthier Lives opted to commission much of its research directly rather than hold openly contestable processes.<sup>5</sup> This was a strategic decision that enabled engagement and negotiation with leading researchers who were invited to form cross-disciplinary and multi-institutional teams to address priorities identified by stakeholders. While recognising the importance of contestable research as a pillar of the research funding system, Healthier Lives found that commissioning research directly enabled a sharper focus on its mission. A rigorous process for the assessment of research proposals informed Healthier Lives' funding decisions.

Working collaboratively, Healthier Lives research teams produced an evidence base that is already influencing policy and decision makers and which, if implemented fully, will contribute to reducing the inequitable burden of NCDs in the unique context of Aotearoa New Zealand.

Healthier Lives brought together a wide range of researchers and kaupapa partners (knowledge partners or stakeholders) to promote the exchange of knowledge and implementation of research evidence. Together they produced stocktakes of relevant research and policies, supported work to improve the quality of big and linked data, and helped raise awareness of the current and projected costs (both economic and social) of type 2 diabetes. Healthier Lives also produced guidance on co-designing research with integrity and embedding effective pathways between research, policy and practice. It created the Healthier Lives Implementation Network, which will continue to support the implementation of evidence-informed programmes and products to meet the health needs and aspirations of Māori and Pasifika communities.

This is an account of the changes that Healthier Lives set out to make, and of the achievements to date of its research teams and kaupapa partners in realising a shift towards more equitable health outcomes and healthier lives for all New Zealanders.

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<sup>3</sup> This approach relates to placing families, whānau and communities at the centre of determining their own health and wellbeing aspirations and needs, and what is needed to deliver them. It is based on kaupapa Māori theory, informed by the Whānau Ora Outcomes Framework and by the Health Research Council Pacific Health Research Guidelines.

<sup>4</sup> Vision Mātauranga is a New Zealand Government policy that aims to 'unlock the innovation potential of Māori knowledge, resources and people to assist New Zealanders to create a better future'.

<sup>5</sup> Around a third of Healthier Lives research was funded through openly contestable processes. This was enabled by co-funding partnerships with the Health Research Council of New Zealand, the Ministry of Health and the New Zealand Heart Foundation – organisations with existing research funding infrastructure and processes in place.



## Evidence base produced by Healthier Lives

The research outputs produced by Healthier Lives are captured in *Evidence for health and wellbeing in Aotearoa New Zealand*. They include:

### Healthy food and physical activity environments

- Evidence for policy makers on the health and climate co-benefits of dietary change, from stakeholder engagement and modelling
- Insights from evaluations to inform and improve policy for the prevention of NCDs
- Research evidence and leadership, which has contributed to World Health Organization and European nutrition and diabetes guideline development
- Models for increasing the accessibility of active, shared and public transport options for people in low-income communities.

### Culturally centred health interventions for Māori and Pacific communities

- Culturally tailored programmes for Māori and Pacific families and communities to help prevent type 2 diabetes
- The co-designed smartphone app OL@-OR@, for supporting healthy lifestyles
- A Quality–Improvement–Equity Roadmap to reduce access barriers to evidence-based heart health care
- The first New Zealand trial of a nutritional therapy approach for the remission of type 2 diabetes

- A conceptual model for co-designing health programmes with communities
- Frameworks and tools to help health providers implement programmes that will result in equitable health outcomes.

### Precision medicine and personalised prevention

- Technology for affordable, accessible and highly sensitive monitoring of cancer treatment
- Tools for predicting cardiovascular disease risk that are specific to groups within the New Zealand population
- Epigenetic markers of an individual's disease risk.

### Big and linked data

- Data-driven insights into: the prevalence of cancer; the link between earthquake damage to property and CVD-related hospitalisations and deaths; progression rates from prediabetes to diabetes and factors that protect against progression; *H. pylori* testing, positivity, treatment and retesting rates; and outcomes for people who live in families with a member suffering from a chronic disease or mental health disorder.
- Recommendations (and statistical code) for reducing the impact of data linkage bias when measuring NCD rates for ethnic groups.

## Key reports produced by Healthier Lives

Healthy Food and Physical Activity Environments: A stocktake of systematic review evidence, population-level policies and New Zealand research (2019)

Linkage Error and Linkage Bias: A guide for IDI users (2019)

The Economic and Social Cost of Type 2 Diabetes (2021)

Pathways Between Research, Policy and Practice (2022)

Policy Inventory (2022)

Co-designing Health Research in Aotearoa: Lessons from the Healthier Lives National Science Challenge (2024)

Co-designing Health Research in Aotearoa: A short guide (2024)

# Healthy food and physical activity environments



## Prevention of disease at population level

Prevention of disease is an equitable and cost-effective approach for a resource-constrained health system. It also means that people experience less ill health and a better quality of life. There are two main strategies for preventing NCDs:

- A 'risk factor' strategy identifies people with a condition, such as raised blood pressure, that puts them at a higher risk of developing disease (e.g. cardiovascular disease), and treats those individuals to reduce their risk of developing the disease.
- A 'population' strategy aims to shift the whole population into a lower risk category through initiatives that reduce disease risk for everyone, without relying on individual action, and thereby preventing a larger proportion of the population from developing NCDs.

Strategies are already in place for managing those at high risk of developing common NCDs in Aotearoa New Zealand. However, we urgently need more population strategies for preventing disease, because the majority of people who suffer from NCDs are not at high risk. Due to modern lifestyles, a huge number of people are now at *moderate* risk. The health system cannot identify and treat all of them, so the overall burden of disease will continue to rise unless risk factor levels are lowered for the whole population.

Smoking cessation initiatives have successfully reduced population smoking rates. We now need similarly intensive population approaches to reduce poor nutrition, obesity and physical inactivity.

To justify population-wide implementation of disease prevention initiatives, we need evidence that these are likely to be effective. To date, few population initiatives to prevent lifestyle-related diseases have been implemented in Aotearoa New Zealand, and there has been little research to evaluate them. To redress this imbalance, Healthier Lives introduced a research theme focused on developing, evaluating and modelling population-level interventions that are designed to improve food and physical activity environments.

The selection of research to be funded in this theme was informed by a stocktake of national and international research evidence and a workshop with policymakers and researchers to review and prioritise research topics.<sup>1</sup> The overarching aim of this research was to establish an evidence base for future policy decision-making, which is essential if limited public funds are to be used to greatest effect.

## Healthy food environments

Poor nutrition, along with diet-related risk factors such as high blood pressure, high blood glucose, high body mass index and high cholesterol, are now the leading causes of ill health in New Zealand.<sup>2</sup>

The environment we live in influences what we eat. To achieve a population-wide improvement in nutrition, we need to change the food environment, which includes the composition, labelling, marketing, availability, and affordability of foods and drinks.<sup>3</sup>

1 Healthier Lives commissioned Dr Sarah Gerritsen to undertake the stocktake in 2019. The workshop took place at Te Papa Tongarewa in March 2019.

2 Poor nutrition accounted for nearly 20% of illness and early deaths in 2017. GBD 2017 Diet Collaborators. 2017. Health effects of dietary risks in 195 countries, 1990–2017: A systematic analysis for the Global Burden of Disease. *The Lancet*, 393:1958–72.

3 The food environment can be defined as 'the collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status'. Swinburn, B., Sacks, G., Vandevijvere, S., Kumanyika, S. et al. 2013. INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): overview and key principles. *Obesity Reviews*, 14(S1), 1–12. <https://doi.org/10.1111/obr.12087>



New Zealand has evidence-based food and physical activity guidelines, but decades of public health research has shown that targeting behaviour change in individuals (especially through education alone) is not particularly effective at improving the health of a population. Moreover, it is likely to increase health inequity, because privileged groups in society have more resources to enact lifestyle changes. The most effective strategies for creating equitable population-wide improvements in nutrition are interventions that make food environments healthier.<sup>4,5,6</sup>

## Aotearoa New Zealand's food environments

A 2018 INFORMAS<sup>7</sup> report determined that Aotearoa New Zealand's food environments are largely unhealthy, especially for children. It found stark differences between some sectors of the population. For example, economically deprived communities had a far greater density of unhealthy food outlets, with 13.7 fast food and takeaway outlets per 10,000 people in the most deprived areas compared with only 3.7 per 10,000 people in the least deprived.<sup>8</sup>

The report noted there were few Government initiatives to improve food environments. Aotearoa New Zealand has the third highest rate of overweight and obesity within the OECD countries, which the INFORMAS report concluded is largely due to its unhealthy food environments and the degree to which healthy food policies, shown to be effective elsewhere, are not implemented. In fact, fewer than half of international best-practice healthy food policies had been implemented.

Some basic food policies, such as nutrition labelling on packaged food and regulations guiding nutrient and health claims on foods, are in place for Aotearoa New Zealand. But comparable countries (Australia, the UK, Canada and the US) have implemented considerably more policy initiatives to improve their food environments and the health of their populations.

This was also the finding of the 2019 food and physical activity environment policy stocktake commissioned by Healthier Lives. An additional policy inventory, commissioned by Healthier Lives in 2022, found there was no action plan or current policy in place for three major NCDs (cardiovascular disease, obesity and diabetes), all of which are impacted by the food environment.<sup>9</sup>

In Aotearoa New Zealand, the first (and only) nationally coordinated intervention aimed at improving food and physical activity environments was implemented in 2004. Healthy Eating–Healthy Action: Oranga Kai–Oranga Pumau (HEHA) was a government programme aimed at improving nutrition, increasing physical activity and reducing obesity. It was delivered through schools, district health boards and other agencies, with actions in many sectors. The overall focus of HEHA was to create supportive environments, strengthen community actions, develop personal skills and build healthy public policy. It included targeted initiatives for Māori and Pacific Peoples, socioeconomically deprived communities and families or whānau. However, the programme was disestablished soon after a change in government in 2008 and an evaluation of HEHA was never completed.

4 Backholer, K., Beauchamp, A., Ball, K., Turrell, G. et al. 2014. A framework for evaluating the impact of obesity prevention strategies on socioeconomic inequalities in weight. *American Journal of Public Health*, 104(10), e43–e50. <https://doi.org/10.2105/ajph.2014.302066>

5 Swinburn, B., Sacks, G., Hall, K.D., McPherson, K. et al., 2011. The Global Obesity Pandemic: Shaped by global drivers and local environments, *The Lancet*, Vol 378: 814–814.

6 Ni Mhurchu, C., Blakely, T., Jiang, Y., Eyles, H.C., & Rodgers, A. 2010. Effects of price discounts and tailored nutrition education on supermarket purchases: a randomized controlled trial. *The American Journal of Clinical Nutrition* Volume 91, ISSUE 3, P736–747.

7 INFORMAS is the International Network for Food and Obesity/Non-communicable Diseases Research, Monitoring and Action Support.

8 Mackay, S., Swinburn, B., Vandevijvere, S. & D'Souza, E. 2018. INFORMAS Food Environments 2018 Full Report, University of Auckland. Journal contribution. <https://doi.org/10.17608/k6.auckland.6741788.v1>

9 At the time of writing, work is underway to develop a national diabetes action plan.



Another programme, Healthy Families New Zealand, began in 2014 in ten locations and focused on community-driven solutions to locally identified needs. An evaluation of this programme after four years showed increasing rates of adult obesity and overweight in all ten locations compared to the total population; however, inequalities for Māori in adult obesity and overweight had decreased. One key finding of the evaluation was that regulatory inaction had constrained local action. An evaluation of the second phase of this programme (2018–21) showed that it provided significant value to local communities for the resources invested. However, to see large-scale improvements in quantitative indicators of health and wellbeing, a stronger and more coordinated ‘whole system’ action and investment in the prevention system is needed.<sup>10</sup>

In this context, Healthier Lives funded two research projects to investigate how Aotearoa New Zealand could improve its food environments. The first of these was an evaluation of one of the few existing national policies – albeit a voluntary one – aimed at improving food environments in hospitals, other health facilities and government department workplaces. The second project modelled the health impact of national adoption of a healthy and sustainable diet and identified a range of strategies for creating a population-level shift towards such a diet.



<sup>10</sup> Matheson, A., Wehipeihana, N., Gray, R., Uia, T., et al. 2022. Community-up system change for health and wellbeing: Healthy Families NZ Summative Evaluation Report 2022. Health New Zealand Te Whatu Ora, Wellington.

## Applying research evidence to population-level initiatives in Aotearoa New Zealand

Aotearoa New Zealand has previously implemented population-level initiatives in areas that impact the health of the nation.

One example of this, which spans over 50 years, is the introduction of measures to combat harm from smoking. In 1975 a steering committee, comprising members from the Department of Health, the Cancer Society and the New Zealand Heart Foundation (Heart Foundation NZ), was established to consider a World Health Organization report on smoking and health. Then in 1976, a question on smoking was included in the Census for the first time. An important series of publications followed, which documented the pattern of smoking in New Zealand, in particular the high rates among Māori and young women.

The 1986 US Surgeon General's report on passive smoking further mobilised action to reduce smoking. Researchers in New Zealand used international data to estimate the number of deaths attributable to passive smoking in Aotearoa. In 1988 the Southern Hemisphere's first local authority bylaws to restrict smoking in public places were introduced, and in 1990 the New Zealand Parliament enacted the Smoke-Free Environments Act, one of the strongest pieces of anti-tobacco legislation ever passed. The Act was further strengthened by an amendment in 2003 that prohibited smoking in all workplaces, including hospitality venues, airports and schools. Further measures, such as increased taxes on cigarettes, restricted marketing, the use of warning labels and plain packaging on tobacco products, have contributed to further declines in tobacco use.

Another example, implemented in the 1980s, is the population-level initiatives to prevent diet-related diseases. Aotearoa New Zealand at the time had one of the highest rates of coronary heart disease in the world. Measures to reduce saturated fat intake by making low-fat milk and polyunsaturated table spreads widely available were followed by the introduction of the Pick the Tick programme by the Heart Foundation NZ. This programme helped consumers to make healthier food choices and resulted in the inclusion of a nutrition information panel on the back of all 'Tick' packaged foods a decade before it was mandated by government.

Further Heart Foundation NZ initiatives resulted in New Zealand food companies reducing the use of salt (another dietary risk factor for heart disease) in bread, breakfast cereals, margarine and other commonly consumed items. An evaluation of the Tick programme in 1999 found that 33 tonnes of salt had been removed from food products over a 12-month period.<sup>11</sup>

Subsequent evaluations and modelling suggest these initiatives are still helping to reduce salt and saturated fat in the diet of New Zealanders.<sup>12,13</sup>

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11 Young, L. 2002. Impact of the Pick the Tick food information programme on the salt content of food in New Zealand. *Health Promotion International*, 17(1), 13–19. <https://doi.org/10.1093/heapro/17.1.13>

12 Ning, S. X., Mainvil, L. A., Thomson, R. K., & McLean, R. M. 2017. Dietary sodium reduction in New Zealand: influence of the Tick label. *Asia Pacific Journal of Clinical Nutrition*, 26(6), 1133–1138. <https://doi.org/10.6133/apjcn.032017.06>

13 Wilson, N., Nghiem, N., Eyles, H., Ni Mhurchu, C., et al. 2014. Possible impact of the Tick Programme in New Zealand on selected nutrient intakes: Tentative estimates and methodological complexities. *New Zealand Medical Journal*, 127(1399), 85–88.

In 2015 the Ministry of Health requested that all New Zealand district health boards (DHBs) introduce a healthy food and drink policy for staff and visitors. The National Healthy Food & Drink Policy (NHFDP) was subsequently developed by nutrition and public health representatives from DHBs and the Ministry. Although voluntary, the NHFDP was recommended for use by DHBs and other public health sector organisations.

Five years later, the HYPE study, led by Professor Cliona Ni Mhurchu (University of Auckland), began an evaluation to find out if and where the NHFDP had been adopted and what its impact had been. The study also set out to determine what resources were needed to support implementation of the policy and maximise its adoption by public sector institutions, and to examine the equity implications of the policy for Māori, Pasifika and low-income New Zealanders.

Comprehensive audits of food and drink availability were undertaken at 19 DHBs and at the Ministry of Health. Forty-three sites encompassing 229 retail settings (including cafes, cafeterias and vending machines) were audited. A total of 8,523 food and drink items available for sale were classified according to NHFDP criteria: green (healthy), amber (neither healthy nor unhealthy) and red (unhealthy). The NHFDP guidance was that ≥55% of foods available for sale should be green category items, and there should be no red category items on offer.

**Key findings**

The HYPE study found that eight of the 20 DHBs and one central government agency had adopted the voluntary NHFDP. The policies of organisations that had not adopted it were generally not as comprehensive as the NHFDP, and there was regional inconsistency in policy content and scope. However, some individual DHB policies contained stricter or additional clauses that would be useful to incorporate into the NHFDP, such as promoting environmentally sustainable and socially responsible practices for the purchase and supply of food and drinks.<sup>14</sup> No organisation met the criteria for full alignment with the NHFDP (≥55% green category items and 0% red category items).

Table 1 below shows the average alignment according to policy adoption.

	Green	Amber	Red
NHFDP guidance	≥55%	≤45%	0%
Sites that adopted NHFDP	22.0%	45.5%	32.3%
Sites that did not adopt NHFDP	22.2%	30.5%	47.5%
All sites combined	22.1%	38.9%	38.9%

The prevalence of red items ranged from 24.2% to 64.2%. Organisations that adopted NHFDP had healthier foods and drinks on average than those using their own organisational policy, but the proportion of red items remained high at 32.3%.

<sup>14</sup> Several DHBs had stricter policies that required a higher percentage of food and drinks to meet the 'green' criteria for healthiness and sustainability. Various DHBs had policies focused on: reducing food waste (by asking people to confirm attendance at a catered event); prioritising local food suppliers and producers; reducing single-use plastic packaging; reducing consumption of meat and processed meat; making vegetarian and vegan options available; and implementing meat-free Mondays and fish Fridays.

The study found that both the benefits and the costs of implementing the policy were likely to impact Māori and Pacific staff to a greater extent, because they reported buying food on site more frequently than other staff. This suggests the policy is pro-equity as it would help to reduce Māori and Pacific Peoples' greater risk of nutrition-related diseases. However, the policy is undermined when the healthier (green) foods and drinks provided are seen as poor value for money. Māori and Pasifika staff noted that the relative pricing meant they were more likely to choose less healthy options that were cheaper, or to purchase food off site.

Interviews undertaken with food retailers and providers suggested that the voluntary nature of the NHFDP, and having unhealthy food outlets located close to hospitals, were barriers to implementation; greater central government support and funding would be potential facilitators. Surveys also identified that staff and visitors experiencing financial insecurity were concerned about limited food choices and increased costs, which could limit the equity potential of the policy by impacting adversely those on lower incomes who cannot afford to purchase healthier foods on site.

Overall, the HYPE team concluded that a voluntary NHFDP was not effective in ensuring greater provision of healthy food and drink options in New Zealand health sector organisations, and recommended that a mandatory national policy be implemented to improve health and equity.

### **Implementation**

Study results provided evidence of the ineffectiveness of a voluntary national healthy food and drink policy as a health promotion tool. However, they also highlighted improvements that could be made to it. The research team produced several tools to enhance its future impact.

- A digital tool to support food environment audits and assessment of policy compliance by individual organisations. Previously, only paper-based tools were available, and there was no way of collating data across multiple organisations.
- The Healthy Kai Checker database to help food service managers and retailers search for and identify foods that meet policy criteria. The lack of such a tool was a reported barrier to effective implementation of the NHFDP.
- A customised reporting framework to enable reporting of individual organisations' performance against specific areas of the NHFDP, and identification of areas for improvement.

The findings from the HYPE study offer insights to strengthen any future healthy food policies, including those designed for other settings such as schools and early childhood education centres.

### **Kaupapa partner perspectives**

Stakeholders were involved in the HYPE study from its initial design phase through to implementation. The research proposal was developed in collaboration with the Ministry of Health and the National DHB Healthy Food and Drink Environments Network, which developed the NHFDP. The study collected data from hospital sites, visitors, clinical and administrative staff, food service staff and food retailers.

In July 2022 the New Zealand health and disability system was reformed and the 20 DHBs were disestablished and replaced by a national entity, Health New Zealand Te Whatu Ora (HNZ). The National Public Health Innovation and Advancement Team within HNZ is now exploring whether a mandatory healthy food and drink policy should be introduced for all New Zealand public hospitals and health services. In scoping this, they considered the HYPE study's policy analysis, audit results, survey and interview findings, as well as HYPE student projects on meat-free Monday initiatives and environmental sustainability guidance.

HNZ found the HYPE team’s analysis of the factors that contributed to poor implementation of the NHFDP policy particularly useful, along with the evidence-based recommendations for strengthening the policy and improving future implementation:

*Our team has been tasked with coming up with a Te Whatu Ora-wide Healthy Food and Drink policy. We found the HYPE study results incredibly helpful with the design of the new policy, particularly the HYPE recommendations which were evidence-based and pragmatic.*

**Dr Rob Beaglehole**  
Lead, National Public Health Innovation and Advancement Team  
National Public Health Service, Te Whatu Ora



*By having the HYPE team complete a full evaluation, not only of every food and drink item being sold, but also gathering staff, visitor and foodservice staff feedback, we now will have evidence to update the policy. This update will be more meaningful as we now can take into account the thoughts and opinions from consumers and the struggles from vendors to ensure greater success with implementation by understanding where our focus needs to be.*

**Amanda Buhaets**  
Advanced liaison dietitian, Te Toka Tumai Auckland  
Chair, National Healthy Food and Drink Environment Network





## Sustainable New Zealand Kai: Assessing the health and environmental benefits of sustainable New Zealand diets

The food we eat affects not just the health of our people but also that of our planet. Food production accounts for 26% of greenhouse gas (GHG) emissions worldwide; in New Zealand it contributes 50% of GHG emissions.<sup>15</sup>

In 2019 the international EAT-Lancet Commission delivered a scientific review of what constitutes a healthy diet sourced from a sustainable food system, known as the EAT-Lancet diet.<sup>16</sup> The Sustainable New Zealand Kai project, led by Dr Cristina Cleghorn (University of Otago), designed a New Zealand version of the EAT-Lancet diet (the first country-specific version of this ideal diet) to meet New Zealand's dietary guidelines. It was to be no more expensive than the typical New Zealand diet that people reported eating in the last national nutrition survey. With more fruit and vegetables, some fish, and no beef, lamb, pork or poultry, this theoretical diet differed greatly from that which New Zealanders typically eat.

The research team then worked with Māori nutrition and health experts to design a culturally appropriate version of the New Zealand EAT-Lancet diet. This contained less dairy, more potatoes, kūmara, taro, fish and seafood, and some poultry, lamb, mutton, other meats and eggs.

Researchers used modelling methods to estimate the health and environmental impacts of these theoretical diets, including various scenarios for replacing red and processed meat in the New Zealand diet.

The team also collaborated with researchers from Our Land and Water National Science Challenge, to see whether it would be possible to produce the right crops in Aotearoa New Zealand to feed our population a healthy, sustainable diet while reducing greenhouse gas emissions or freshwater contamination and minimising the financial impact on families and food producers.

A systematic review of international research was undertaken to identify examples of viable strategies for shifting a population towards a healthier and more sustainable diet. Only two such strategies were found, both aimed at reducing meat intake.

Given the sparse international evidence, the research team consulted government, industry and community representatives, including Māori stakeholders and researchers, to identify policies that could potentially support New Zealanders to adopt healthier and more sustainable eating patterns. They produced a list of 111 potential policies aimed at: changing the food system (59% of suggested policies); the food environment (32%); and individual behaviour (10%). This was whittled down to five stakeholder-selected policies with good evidence of effectiveness, which the research team then modelled to estimate their potential health impacts:

- Supporting more māra kai and community gardens
- Expanding garden-to-plate programmes in schools/kura
- Ensuring all schools/kura have healthy food and drink policies
- Providing community education about sustainable and healthy food
- Removing GST from sustainable core foods.

<sup>15</sup> Ministry for the Environment. NZ Greenhouse Gas Inventory 1990–2019. 2021. Ministry for the Environment. New Zealand's Greenhouse Gas Inventory 1990–2022: Snapshot. Wellington, 2024.

<sup>16</sup> The EAT-Lancet Commission on Food, Planet, Health, co-chaired by Walter Willett and Johan Rockström, brought together 19 commissioners and 18 co-authors from 16 countries with expertise in various fields including human health, agriculture, political science and environmental sustainability. A sustainable food system is one that remains within nine 'planetary boundaries' that affect Earth's life support system.

## Key findings

Modelling results showed that adoption of the New Zealand version of the EAT-Lancet diet across the population would generate large health gains, cost savings to the health system, and reductions in GHG emissions. Shifts towards this diet would also improve health equity between Māori and non-Māori significantly.<sup>17</sup> The health gains of adopting the culturally appropriate version of this diet for Māori were 15% lower than the original optimised diet, but still substantial.

The research undertaken with Our Land and Water National Science Challenge showed that changing land use (in the parts of the country where it already needs to change to meet water quality targets) would enable Aotearoa New Zealand to produce a home-grown healthy diet based on the New Zealand version of the EAT-Lancet diet. What's more, this would meet environmental targets without severely impacting export trade.<sup>18</sup>

Several options for replacing red and processed meat with plant-based alternatives were also modelled. All were found to be nutritionally adequate and likely to generate large health gains, health system savings, reductions in GHG emissions and improvements in health equity between Māori and non-Māori.<sup>19</sup> Together, this series of modelling studies showed that a healthy, climate-friendly, cost-neutral diet adopted across the New Zealand population would lead to numerous benefits.

Modelling of the five policies identified by stakeholders showed that, if implemented, they could help shift population-level food consumption in Aotearoa New Zealand towards healthier and more sustainable food. All five policies would result in health benefits and more equitable health outcomes. Three of them (removing GST from core sustainable foods;<sup>20</sup> a mass media campaign to educate adults about sustainable, healthy foods; and healthy food and drink policies at schools/kura) would result in overall cost savings. The other two would be cost-effective (expand garden-to-table programmes in schools/kura) or borderline cost-effective (more māra kai and community gardens).<sup>21</sup>

## Kaupapa partner perspectives

Incorporating the views of stakeholders was central to this research project. The study team elicited stakeholder views on what 'sustainable diet' meant to them; what policies they would like to see the government implement to support New Zealanders to eat healthily and sustainably; how they rated these policies; and how they thought the selected policies should be implemented in Aotearoa New Zealand.

Stakeholders saw value in this research and were keen for it to lead to action:

*I think it is important to do whatever we can to make healthy and sustainable diets a viable reality for people in Aotearoa. We need to be bold and change our current practices in order to have a meaningful effect on the health of our people and planet.*

## Community focus group participant

17 Cleghorn, C., Nghiem, N., & Mhurchu, C. N. 2022. Assessing the health and environmental benefits of a New Zealand diet optimised for health and climate protection. *Sustainability*, 14(21), 13900. <https://doi.org/10.3390/su142113900>

18 McDowell, R. W., Herzig, A., Van Der Weerden, T. J., Cleghorn, C., & Kaye-Blake, W. 2022. Growing for good: producing a healthy, low greenhouse gas and water quality footprint diet in Aotearoa, New Zealand. *Journal of the Royal Society of New Zealand*, 54(3), 325–349. <https://doi.org/10.1080/03036758.2022.2137532>

19 Reynolds, A. N., Mhurchu, C. N., Kok, Z., & Cleghorn, C. 2023. The neglected potential of red and processed meat replacement with alternative protein sources: simulation modelling and systematic review. *EClinicalMedicine*, 56, 101774. <https://doi.org/10.1016/j.eclinm.2022.101774>

20 The cost savings from removing GST from core sustainable foods are likely to be offset by the drop in tax revenue, but of the five policies modelled this one has the highest positive impact on health.

21 A policy is deemed to be cost effective if the cost per HALY (health-adjusted life year) is less than the level of gross domestic product per capita.

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*Consumers are being increasingly bombarded with messages about eating sustainably, but I think in some cases it's hard for people to decipher what is and isn't sustainable, and whether eating sustainably is affordable – especially during a cost-of-living crisis. It needs to be easier for people to make healthy and sustainable choices. This isn't just up to individual consumers, but needs some bold decisions to make sustainable eating choices easy and affordable.*

**Community focus group participant**

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## Healthy physical activity environments

Regular physical activity is essential for good health. It can improve blood glucose control in people with diabetes and prediabetes and reduce the risk of heart attacks, strokes, type 2 diabetes and some cancers.<sup>22,23</sup> However, almost half the adults surveyed in the most recent New Zealand Health Survey (2021/22) did not undertake the recommended level of physical activity, and 12.8% undertook almost none. Evidence from the Dunedin Multidisciplinary Health and Development Study indicates that New Zealanders may be losing physical fitness at a startling rate; participants born in 1986/1987 were found to be 19–36% fitter than their children.<sup>24</sup>

How can we reverse this population-wide decline in physical activity? Simply encouraging individuals to do more exercise (i.e. physical activity that is purposefully focused on physical fitness) has limited effectiveness and is likely to exacerbate existing health inequities, because it relies on people having the money, time, education, self-confidence and physical ability to participate.

Exercise is only one form of physical activity, however; there are other ways to incorporate more physical activity into our daily lives.<sup>25</sup> Switching from the use of motor vehicles for short trips to more active modes of travel – such as walking, biking or using public transport – is one of the most effective ways of increasing physical activity. (It also improves air quality, reduces carbon emissions and fosters neighbourhood social connections.) However, dependency on cars is entrenched in Aotearoa New Zealand and is reinforced by car-supportive urban environments, making it challenging to create such a population-level shift.

The environment that we live in influences how we move around in it. Increasing the ease, safety and attractiveness of walking and cycling may be one of the most effective and equitable ways of changing travel behaviour and increasing physical activity at a population level.<sup>26</sup>

22 Boniol, M., Dragomir, M., Autier, P., & Boyle, P. 2017. Physical activity and change in fasting glucose and HbA1c: a quantitative meta-analysis of randomized trials. *Acta Diabetologica*, 54(11), 983–991. <https://doi.org/10.1007/s00592-017-1037-3>

23 Kyu, H. H., Bachman, V. F., Alexander, L. T., Mumford, J. E. et al. 2016. Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013. *BMJ*, i3857. <https://doi.org/10.1136/bmj.i3857>

24 McAnally, H.M., Reeves, L.M., Sligo, J.L. & Hancox, R.J. 2018. Intergenerational changes in adolescents' physical fitness and weight in New Zealand. *New Zealand Medical Journal*, 131: 1482.

25 Dasso, N. A. 2018. How is exercise different from physical activity? A concept analysis. *Nursing Forum*, 54(1), 45–52. <https://doi.org/10.1111/nuf.12296>

26 Curl, A., Kearns, A., Macdonald, L., Mason, P., & Ellaway, A. 2018. Can walking habits be encouraged through area-based regeneration and relocation? A longitudinal study of deprived communities in Glasgow, UK. *Journal of Transport & Health*, 10, 44–55. <https://doi.org/10.1016/j.jth.2018.06.004>

Urban renewal programmes provide an opportunity to modify street layouts and transport infrastructure in ways that support active travel and discourage the use of motor vehicles for short trips. They also provide an opportunity to engage residents in co-designed community trials, which can generate new knowledge about what strategies are most effective in enabling a shift to healthier and more sustainable transport behaviours.

Increasing access to shared e-bikes and other vehicles is another way of overcoming car dependence and creating a shift in travel behaviour. Although there is a slight inconvenience in booking a shared vehicle, research shows that people who adopt this method start thinking about every journey and often end up walking, cycling or catching the bus.<sup>27,28</sup> People may need a vehicle to get to work, access healthcare, buy groceries or visit family. Having access to a shared car or e-bike, without the associated costs of owning one, makes them less likely to travel by car unless they really need to, and allows equitable access to vehicles for those times when they do.

The business models of many commercial shared vehicle schemes can increase inequities in transport choice because they favour locating services in high socioeconomic and central-city locations. Reliability of access is critically important in determining whether shared transport is a viable option, and cost can be a major barrier for low-income groups, especially for regular journeys such as travelling to work.

Achieving population-scale changes in levels of physical activity in New Zealand's traditionally low-density, car-dependent cities will require more integrated land use, housing and transport planning. Robust evidence will also be needed about the range of factors – built environment, regulatory, institutional, social, cultural and economic – that need to come together to support behavioural change.

No single agency, professional group or organisation has the requisite skill set or mandate to achieve these desired outcomes alone. But bringing together the knowledge and expertise of mana whenua, residents, urban designers, transport planners and researchers, to explore new ways of designing urban infrastructure and develop locally attuned approaches, could have the power to challenge conventional practices.<sup>29,30,31</sup>

Healthier Lives therefore joined forces with Ageing Well NSC to co-fund research that engaged residents of two cities and generated new knowledge of what works (and what doesn't) to increase healthier, more sustainable transport behaviours, and to create more socially connected communities. In Ngā Hau Māngere, South Auckland, the research investigated how retro-fitting an urban environment and increasing transport choice could encourage more active modes of transport. In Ōtautahi Christchurch it explored how shared transport schemes could support active travel by relieving the need for private vehicle ownership.

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27 Kumar Mitra, S. 2021. Impact of carsharing on the mobility of lower-income populations in California. *Travel Behaviour and Society*, 24, 81–94. <https://doi.org/https://doi.org/10.1016/j.tbs.2021.02.005>

28 Schure, J., Napolitan, F. & Hutchinson, R. 2012. Cumulative impacts of carsharing and unbundled parking on vehicle ownership and mode choice. *Transportation Research Record*, 2319(1), 96–104. <https://doi.org/10.3141/2319-11>

29 Marletto, G. 2014. Car and the city: Socio-technical transition pathways to 2030. *Technological Forecasting and Social Change*, 87, 164–178. <https://doi.org/10.1016/j.techfore.2013.12.013>

30 Geels, F. W. 2014. Regime Resistance against Low-Carbon Transitions: Introducing Politics and Power into the Multi-Level Perspective. *Theory, Culture & Society*, 31(5), 21–40. <https://doi.org/10.1177/0263276414531627>

31 Geels, F. W. 2012. A socio-technical analysis of low-carbon transitions: introducing the multi-level perspective into transport studies. *Journal of Transport Geography*, 24, 471–482. <https://doi.org/10.1016/j.jtrangeo.2012.01.021>

## Activating change through interventions for active travel in our neighbourhoods (ACTIVATION)

### Ngā Hau Māngere, South Auckland

There is little research evidence, either national or international, about how to transform low-density, suburban neighbourhoods into environments that support active travel, or how to promote active travel in ways that offer equitable transport opportunities and outcomes to everyone.

The Ngā Hau Māngere ACTIVATION study, led by Professor Karen Witten (Massey University), Dr Hamish Mackie (Mackie Research), and Professor Alistair Woodward (University of Auckland), comprised a cluster of eight sub-projects<sup>32</sup> that collectively gathered evidence for an optimal mix of neighbourhood-scale interventions to promote active travel and increase physical activity in lower-socioeconomic suburban neighbourhoods.<sup>33</sup>

The first project investigated walking and cycling cultures in South Auckland and identified the importance of whānau- and community-based opportunities for active travel, which informed subsequent projects. The second project co-designed a series of e-bike trials in partnership with Triple Teez, a community organisation promoting cycling in Ngā Hau Māngere. E-bikes have huge potential for increasing physical activity, reducing GHG emissions, and reducing household fuel costs. Although ubiquitous in some communities, prior to these trials e-bikes were absent from Ngā Hau Māngere due to the prohibitive up-front purchasing cost.

Stage 1, the 'Give-it-a-Go' trial, tested the level of interest in e-bikes by offering residents skills training and the opportunity to ride an e-bike. Stage 2, 'E-bikes in Everyday Life', provided 40 residents with an e-bike for three months to see how people would incorporate them into their daily lives. Stage 3, 'A Pathway to Permanence?', established the Ngā Hau Māngere community e-bike library to find out whether this would be a sustainable way of keeping the e-bikes in the community.

The research also investigated the features of street design that promote active travel for older people and allow mana whenua to see their identity and culture represented in streetscapes, as well as the factors that support or hinder inter-agency collaboration around the planning, designing and funding of active travel infrastructure.

### Key findings

Give-it-a-Go established strong local interest in the opportunity to ride an e-bike, which challenged preconceptions about e-bike use in lower-income communities, especially for older Pasifika women. There was strong use of e-bikes for recreation and commuting in Ebikes in Everyday Life. Participants identified many benefits, including lower fuel costs, more exercise, more time spent in nature and the ability to travel further afield. Data collected in the seven days

<sup>32</sup> The eight projects were: 1. South Auckland walking & cycling cultures; 2. Trials of services and infrastructure; 3. Kaumātua Māori residents' everyday experiences of community redesign and wellbeing; 4. Everyday experiences of Pasifika elders; 5. Māori residents' photovoice perceptions of cultural landscapes and re-indigenising streetscapes; 6. Interagency collaboration; 7. Māngere residents' survey; 8. Investigating changes in population level HbA1c.

<sup>33</sup> These projects built on Te Ara Mua – Future Streets (TAM-FS), an earlier study funded by the Health Research Council of New Zealand that focused on changing the built environment to make walking and cycling to local destinations easier and safer for residents. ACTIVATION extended TAM-FS and was greatly aided by relationships between the research team and local government, mana whenua, and community groups established during the TAM-FS study.

prior to the trial and its final seven days showed that participants' cycle trips had increased from 4% at baseline to 33%; their car trips were reduced by 25%. Drawing on findings from the earlier trials, Triple Teez then set up an e-bike library in Ngā Hau Māngere to maintain community access. A strength of the library was its relational approach, which ensured e-bike borrowers understood and observed Triple Teez's community-centric kaupapa. As a result of this, no e-bikes were lost or damaged during the trial period.

More broadly, the study found that whānau or group activities that offer social connection and fun are key to building and sustaining walking and cycling in South Auckland. Wide, off-road walking and cycling spaces that provide opportunities for exercise (and access to nature) for groups of people are favoured over infrastructure designed for solo riders. Kaumātua and Pasifika elders value wide footpaths and raised pedestrian crossings, as these increase their confidence that approaching cars will come to a complete stop. Mana whenua value features in the cultural landscape that act as markers of connection and belonging to place.

These are significant findings. The ways that people participate in walking and cycling differs between communities, so understanding community aspirations for future investments in walking and cycling infrastructure is an increasingly important focus for local transport agencies.

The study also found that alignment between the transport, housing and local government sectors is strong at a strategic level, but delivery can stall due to a lack of agreement over design features and funding responsibilities, especially the costs of long-term asset maintenance. Acceptance of innovative solutions is harder to win when considered alongside business-as-usual designs and their well-established long-term maintenance costs.

**Kaupapa partner perspectives**

From 2021 onwards, the research team convened monthly Zoom meetings attended by researchers and representatives from NZ Transport Agency Waka Kotahi (NZTA), the Ministry of Transport and Auckland Transport who were involved in trialling, promoting and developing policy to support greater use of e-bikes. This was a useful avenue for rapid knowledge exchange. An e-bike symposium hosted by the ACTIVATION team in March 2024 had its genesis in these monthly meetings.

Members of the research group were asked to participate in NZTA, Ministry of Transport and Auckland Transport policy development processes, and the Ngā Hau Māngere e-bike trials appeared as a case study in NZTA's 'Cycling Action Plan'.<sup>34</sup>

External agencies valued the expertise of ACTIVATION research team members and the knowledge and evidence they had accumulated:

*E-bikes continue to be a critical tool in our efforts to decarbonise the transport system, with them providing a healthy, cost-, space- and energy-efficient way to complete the journeys we make most often. Research like that done by the ACTIVATION team is critical for informing decision making, supporting public messaging and advocating for change.*

**Kathryn King**  
Urban mobility manager, Waka Kotahi

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34 [www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/strategies-and-plans/waka-kotahi-cycling-action-plan/](http://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/strategies-and-plans/waka-kotahi-cycling-action-plan/)

## Ōtautahi Christchurch

The Ōtautahi Christchurch arm of the ACTIVATION project tested the hypothesis that providing people with options for shared transport could have a positive impact on their health and wellbeing. It also looked at the best ways of operating shared transport schemes to maximise their potential. To our knowledge, it is the first New Zealand study to examine how to incentivise shared travel in a residential setting.

The research team, led by Professor Simon Kingham (University of Canterbury) and Dr Angela Curl (University of Otago), undertook case studies in two residential settings in central Christchurch:

- The 90-unit Brougham Street social housing complex operated by the Ōtautahi Community Housing Trust (ŌCHT), which offered shared access to five e-bikes at no cost to residents and two electric cars for hire (with support from Lime and Zilch respectively); and
- The Park Lane lifecare village for older people, which has around 80 units operated by Arvida Group, who introduced 15 electric and hybrid cars for residents to share at no cost.

Researchers interviewed and surveyed residents and control groups in each setting to find out how access to shared transport affected their travel practices, attitudes, experiences and social connectedness.

### Key findings

The baseline survey of Brougham Street residents, conducted in 2021 before the shared vehicle scheme was introduced, produced stark findings. Lack of access to transport prevented the majority of residents from participating in activities that are fundamental for health and wellbeing and which most New Zealanders take for granted. Over the preceding 12 months, at least occasionally, the majority of residents reported being unable to attend a medical appointment, do their grocery shopping or visit friends or family because of transport issues.

A follow-up survey conducted in 2022 found that while walking remained the most common form of transport in the week prior to the survey, around 25 Brougham Street residents had made good use of the five shared e-bikes and reported enhanced wellbeing. For example, one tenant used a bike as their means of getting to work each day, a return journey of 18km. Another tenant, who was isolated and unhappy due to an injury that prevented them from riding a conventional bicycle, was able to re-establish their social connections because the e-bikes were easier to ride. A third tenant was able to visit their GP – usually a two-hour walk.

These personal stories reveal the powerful impact that access to shared transport can have. The e-bikes were 'phenomenally important' for some residents, according to ŌCHT tenancy manager Trudy Morris, who also noticed that the scheme created a stronger sense of community and reduced conflict among residents.

Mental health and community benefits were also evident in the Park Lane retirement village trial, in which residents organised group outings in the shared vehicles and showed other residents how to use them, sparking new social connections and improving the atmosphere of the village. The reduction in the use of petrol or diesel vehicles also provided environmental benefits. Retirement village operators favour such schemes as they require less land to be set aside for individual car parks.

Park Lane is close to the city centre, and residents have multiple public transport options within easy reach. Residents of Burlington, a retirement village in an outer suburb of Christchurch, have far less access to public transport. In a sign of growing interest in shared transport, after hearing about the Park Lane study the Burlington residents contacted the research team to ask for similar research to be conducted in their community.

**Implementation**

A key question for the research team was how shared mobility schemes could be rolled out on a bigger scale and made sustainable beyond the research phase. The team collaborated with other researchers investigating different shared transport schemes in Ngā Hau Māngere and Wainuiomata, to see if it was possible to identify a model that works best, or perhaps a suite of models that work well in different contexts. While that work has not yet reached the implementation stage, one incidental finding of the research has already been implemented.

In March 2022 the New Zealand Government introduced half-price bus fares for 15 months as part of a suite of temporary measures to alleviate the cost-of-living crisis. In the second survey of Brougham Street residents, the research team took the opportunity to include a question about the impact of these reduced fares. The results showed that half-price bus fares were critically important in enabling people on lower incomes to travel by bus; almost half the residents reported being able to make trips that they wouldn't otherwise have been able to afford.

The research team provided this evidence to government agencies and regional councils, and the Government subsequently announced that half-price fares would continue to be offered to Community Service Card holders through the Community Connect programme:

*The research on the impact of half-price fares provided an important layer of insight into the outcomes of the fare stimulus in Canterbury. The national research, conducted by Waka Kotahi, provided useful information into the mode shift that the fares influenced, as well as what new trips were induced as a result of the discounts. Overlaying this local research provides valuable insight into how important this new travel can be. It's easy to write off induced demand from an outcomes perspective, but for the group that this research focused on it was clear that important journeys such as shopping for essentials or accessing healthcare were enabled through the improved affordability of fares. These insights were referenced in a briefing to our council earlier this year and are a useful reference point as we launch the Community Connect Community Services card discount as part of our reduced fares package in July.*

**Thomas MacNaughton**  
Manager, Public Transport Customer Experience and Marketing,  
Environment Canterbury (June 2023)



**Kaupapa partner perspectives**

E-transport companies Lime and Zilch committed to the ACTIVATION project from a sense of social responsibility but also because the researchers worked hard to facilitate their involvement, organising regular meetings between the transport and housing providers, a monthly check-in for Brougham Street residents, and agreements to make data sharing easier for all parties:

*Lime's mission is to build a future where transportation is shared, affordable and carbon-free. Being involved within this project helps us trial solutions and communicate to those who need affordable transport options most. We hope the learnings from this and similar projects will shape the future transport systems, and our involvement within the transport space.*

**Liam Carroll**  
Operations manager, Lime





As well as regular contact with the housing and transport providers, the project had a steering group with representatives from the Ministry of Transport, NZTA, Christchurch City Council, Ngāi Tahu and Health New Zealand Te Whatu Ora. Intended to be 'low energy, high value' for its members, it met twice a year to share information and help guide the project. Steering group members were important stakeholders in the research who could take its findings directly to their own organisations:

*The ACTIVATION project has provided valuable insights into the accessibility challenges faced by sectors of our community with fewer transport options, and the impacts our investments have on them. The trial has added to the body of knowledge on how access can be provided to those that benefit less than average from our current transport system in a way which is cost effective. It has also helped our understanding of the challenges resulting from implementing innovative solutions to addressing these access issues. The ACTIVATION project has also brought together a group of people from across government and academic institutions to help the learnings from the project influence decision making more rapidly.*

**Darren Fidler**

Christchurch City Council/Waka Kotahi

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As evidence accumulates, policymakers may consider whether a shared mobility fund for lower-income communities is as important as investing in cycleways and public transport subsidies.

## New ways of doing research

All Healthier Lives research in this theme was designed to move the policy agenda forward in Aotearoa New Zealand by pointing to gaps or limitations in existing policies and producing evidence and tools that can be used to strengthen policy implementation.

Policy approaches are critically important tools for the prevention of NCDs and are widely used internationally. However, when compared to most other OECD countries, New Zealand has a dearth of public policy to improve the health of its population. Where policies do exist, there are few available resources to support their successful adoption.<sup>35</sup>

The research that Healthier Lives commissioned – a mix of evaluation, small-scale trials, qualitative surveys, systematic reviews and epidemiological modelling – produced a raft of evidence to inform policy development, as well as tools and models to enhance policy adoption. It also raised awareness about the need for new policies to improve food and physical activity environments in Aotearoa New Zealand.

The research was undertaken in close collaboration with policymakers, stakeholders and end-users, and its findings are already providing valuable insights and information. Until recently, policy guidelines were typically developed by a select group of experts. Healthier Lives' emphasis on co-designing research with stakeholders and end-users meant that a wide group of voices was heard, such as hospital food providers and staff (HYPE), urban and rural Māori (Sustainable New Zealand

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<sup>35</sup> Among the few policies in place to improve New Zealand food environments are: the voluntary Health Star Rating system to alert consumers to the overall nutrition content and healthiness of packaged foods; the voluntary National Healthy Food and Drink Policy to encourage health sector leadership in promoting and normalising healthy food environments in work and public places; and the Ka Ora, Ka Ako Healthy School Lunches programme.

Kai), social housing tenants, mana whenua and older people (ACTIVATION). This strengthened the findings by ensuring that they are applicable in the real world.

The research projects in this theme were commissioned following a 2019 workshop that brought together policymakers and researchers to identify priorities. In 2021, Healthier Lives hosted another workshop with policymakers, researchers and community health providers to consider, more broadly, the pathways between research evidence and policymaking (and also practice) in Aotearoa New Zealand. The ensuing report, *Pathways Between Research, Policy and Practice*, identified underpinning principles and key elements to strengthen these pathways, and led directly to the establishment of a forum for knowledge exchange between policymakers and researchers on nutrition-related health issues.

Healthier Lives' contribution to improving food and physical activity environments in Aotearoa New Zealand has been to focus on the importance of effective policy in the health and transport sectors, produce evidence that can be used to enhance policy, and develop tools that can support the implementation of policy.

## Next steps

International experience shows that to address the underlying causes of lifestyle-related diseases, Aotearoa New Zealand needs to introduce bold policy actions and then evaluate them as 'natural experiments'. Lack of evidence is often cited as a reason for not implementing a population health intervention, but large-scale trials in this area would be unrealistic, expensive and unethical. We need a practice-based evidence pathway, where sensible interventions based on the best available evidence are implemented and then evaluated to produce evidence of their effectiveness along with strategies for enhancing them.<sup>36</sup>

Historically, vested interests have lobbied to reverse, stall or water down legislative initiatives to improve food and physical activity environments, so bi-partisan political support for them is needed. Making a strong case for action and creating public awareness will be critical in achieving this.

## Healthy food environments

Diets that are more sustainable for the planet are also healthier for humans. At a time when Aotearoa New Zealand is grappling with climate change and unprecedented strains on its health system, understanding the impact of the foods we eat on GHG emissions and health system costs is vitally important. The findings of Healthier Lives research provide policymakers with invaluable data to inform policies for improving both health and environmental outcomes.

One piece of evidence urgently needed in Aotearoa New Zealand, to enable accurate policy evaluation, is comprehensive information about what foods our population is currently eating. This can only be obtained from a national nutrition survey. The last such survey of adults was undertaken in 2008–09 and the most recent survey of children in 2002, making the information collected in those surveys very dated. In 2019 Healthier Lives called for a new survey. The Ministry of Health subsequently commissioned a team at the University of Auckland and Massey University Wellington to develop the methodology and tools for a national survey. This work has been completed.<sup>37</sup> At the time of writing, however, confirmation of funding for a national nutrition survey is still awaited.

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36 Ogilvie, D., Adams, J., Bauman, A., Gregg, et al. 2019. Using natural experimental studies to guide public health action: turning the evidence-based medicine paradigm on its head. *Journal of Epidemiology and Community Health*, 74(2), 203–208. <https://doi.org/10.1136/jech-2019-213085>

37 Mackay, S., Ni Mhurchu, C., Grey, J., Follong, B. et al. 2023. Nutrition Survey Development. Final Report and Recommendations. The University of Auckland. Report. <https://doi.org/10.17608/k6.auckland.23938116.v1>

Integrating information about what New Zealand produces and eats with the multifaceted effect it has on people and the planet is critical for sustainable solutions to the most important issues facing the country. In 2023, along with six other National Science Challenges, Healthier Lives called for a science-informed food strategy to address the complex ways in which food consumption and production impact our health, wellbeing, climate, environment, economy, livelihoods and resilience to natural disasters. NSCs have collectively produced robust evidence that could underpin the development of a food strategy for Aotearoa New Zealand.

## Healthy physical activity environments

Central government policies around urban planning and transport priorities were significantly altered by a change of government in 2023. Consequently, the 2024 Government Policy Statement (GPS) on Transport did not acknowledge the transport sector's contribution to environmental degradation, population-level declines in physical activity and health inequities. Members of the ACTIVATION research team made submissions highlighting these omissions and presenting an evidence-based position.

Despite the deprioritising of active travel investment by central government, the monthly online networking meetings convened by the ACTIVATION team will continue as a forum for sharing e-bike and cycling promotion initiatives. Research teams will look elsewhere for partners to advance the research findings on active travel and shared mobility. Local government, iwi groups, community organisations and commercial e-bike companies have a keen interest in promoting transport choices.

There is strong evidence that the way we design our streets, cities and transport systems is associated with the physical activity patterns of residents. Those who use active travel are more likely to meet recommended levels of physical activity than those who drive. Supporting active travel is an efficient and equitable way to increase population-level physical activity, thereby reducing the risk of cancer, cardiovascular disease, diabetes and obesity. It is a message embraced by many major cities around the world. The research evidence produced by Healthier Lives will assist decision-makers to implement these health- and climate-friendly policies.

## Conclusion

Improving food and physical activity environments in Aotearoa New Zealand is an urgent priority. It would lead to health gains across our population and reduce pressure on our health system, which is at risk of being overwhelmed by rising rates of lifestyle-related diseases. It would also have co-benefits for planetary health.

Isolated, small-scale initiatives will not be sufficient to reverse, or even slow, the current trajectory of NCDs. Government-led and nationally coordinated action plans for improving food and physical activity environments are needed if we are to improve the health of all New Zealanders equitably.

Raising public awareness about these issues may be a pre-requisite for achieving political consensus to act on them. Meanwhile, independent research will continue to build the evidence for effective and equitable ways to improve population diets, activity and health.



# Culturally engaged health programmes for Māori and Pacific Peoples



## The right to health

Health is a fundamental human right and is essential to the social and economic fabric of society. The New Zealand Human Rights Commission states that the right to health (tika ki te whai oranga) includes access to healthcare as well as the underlying social and economic determinants of health.<sup>1</sup> However, data on health outcomes show stark inequities for some parts of our population, in particular for Māori and Pacific Peoples.

In addition to the personal and social consequences of health inequities, a conservative estimate of their cost to the country is almost one billion dollars per year.<sup>2</sup> As well as moral and economic imperatives, there are legal requirements to address this human rights issue. Article 3 of Te Tiriti o Waitangi / The Treaty of Waitangi guarantees Māori the same rights as non-Māori, and the United Nations Declaration on the Rights of Indigenous Peoples requires states to take the necessary steps to meet the health needs of Indigenous populations.

The need to eliminate health inequities is also enshrined in legislation such as the New Zealand Bill of Rights Act 1990, which creates an obligation to act on unlawful discrimination, and the Pae Ora (Healthy Futures) Act 2022, which is intended to 'achieve equity in health outcomes among New Zealand's population groups, including by striving to eliminate health disparities, in particular for Māori'.

For all these reasons, Healthier Lives set the achievement of equitable health outcomes in Aotearoa New Zealand as its central goal: a starting point for greater health and wellbeing for all New Zealanders.

## Health inequities

Health inequities have been defined as differences in health outcomes that are 'unnecessary and avoidable' but also 'unfair and unjust'. They are widely recognised as resulting from inequalities in the distribution of the social, environmental, economic and political determinants of health.<sup>3</sup>

Aotearoa New Zealand is not currently meeting its obligation for all citizens to have equitable access to healthcare and equitable health outcomes. Māori (17.8% of the population in 2023) and Pacific Peoples (8.9%) experience significant health inequities, as revealed by mortality rates for each of the major NCDs within Healthier Lives' remit. In 2021 Māori mortality was 1.8 times higher than non-Māori for cardiovascular disease, 1.6 times higher for cancer, and 3.6 times higher for diabetes mellitus; the mortality of Pacific Peoples was 2.0 times higher than the European/Other population for cardiovascular disease, 1.4 times higher for cancer, and 9.1 times higher for diabetes mellitus.<sup>4</sup>

Overall life expectancy for Māori is increasing, but it is also increasing for non-Māori. A stubborn gap of around seven years remains between the life expectancy of Māori and that of the rest of the population; for Pacific Peoples in Aotearoa New Zealand, the life expectancy gap is six years.<sup>5</sup> Some progress in closing the gap for Māori has been made over the last 20 years, but at the current slow rate of progress it has been estimated that it will take another 75 years to close completely; for Pacific Peoples the gap is not closing.<sup>6</sup> Given that the prevalence of type 2 diabetes among Pacific Peoples

1 Te Kāhui Tika Tangata Human Rights Commission. (n.d.) *Right to Health*. Retrieved June 16, 2024, from <https://tikatangata.org.nz/human-rights-in-aotearoa/right-to-health>

2 Reid, P., Paine, S. J., Te Ao, B., et al. 2022. Estimating the economic costs of Indigenous health inequities in New Zealand: a retrospective cohort analysis. *BMJ Open*. 12(10):e065430. doi:10.1136/bmjopen-2022-065430

3 Robson, B., Harris, R. (eds). 2007. *Hauora: Māori Standards of Health IV. A study of the years 2000–2005*. Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare.

4 Health New Zealand Te Whatu Ora. 2024. Mortality Web Tool. Retrieved June 29, 2024, from <https://tewhatuora.shinyapps.io/mortality-web-tool/>

5 Health New Zealand | Te Whatu Ora. 2024. *Aotearoa New Zealand Health Status Report 2023*. Health New Zealand | Te Whatu Ora.

6 Association of Salaried Medical Specialists and the Canterbury Charity Hospital Trust. 2021. *Creating Solutions Te Ara Whai Tika: A roadmap to health equity 2040*. Association of Salaried Medical Specialists and the Canterbury Charity Hospital Trust.



is projected to increase significantly over the next 20 years, this gap will widen unless action is taken to reverse the trajectory of this disease.<sup>7</sup>

Health inequities are primarily driven by factors within wider society, but research has shown that some inequities arise from factors within the health system itself. These factors are within the capacity of the health system to address. Māori and Pacific Peoples experience inequities across the spectrum of healthcare, including access to screening and immunisation programmes, access to primary, secondary and tertiary health services, and the quality of care received. The persistent life expectancy gaps, and differences in mortality rates for potentially preventable conditions over many decades, point to the absence or ineffectiveness of current measures to address these inequities.

In this context, when Healthier Lives asked Māori community leaders and researchers about their priorities for research, there was consensus in favour of research to reduce inequities in future health outcomes through informing systemic changes in service delivery. Pacific communities and health providers emphasised the importance of family-centred approaches to ensure the success of programmes that aimed to reduce health inequities.

## Effective models of healthcare

There is a greater likelihood of developing effective healthcare models when the people impacted by them have a say in their development. Health programmes developed in partnership with communities can be more effective for Māori and Pacific Peoples than those which are not. Such programmes may be adapted from existing models or developed from scratch, but a critical factor in their effectiveness is that they are culturally relevant and engaged.

To ensure their long-term sustainability, culturally engaged health programmes must be capable of being scaled up from a local context and/or adapted for use by others, within prevailing policy and funding parameters. Co-designed and community-led models of healthcare delivery have great potential to increase health equity, but the 'mainstream' health system also needs to deliver healthcare in ways that will lead to equitable outcomes.

Healthier Lives therefore focused research within this theme on: 1) co-designing culturally engaged health programmes and resources in partnership with communities; 2) developing strategies to embed the design of equitable health programmes within the New Zealand health system; 3) using data and modelling to prioritise research evidence for implementation; and 4) establishing an Implementation Network to facilitate the uptake of new research programmes.

### Health inequity research in Aotearoa New Zealand

Research on the determinants of health inequities between Maori and non-Maori began as early as 1914.<sup>8</sup> In the 1960s and 1970s intermittent Department of Health publications collated official health statistics focused on Māori health. It was not until the 1980s that research by Eru Pomare, Neil Pearce and others systematised the description of Māori health inequities, resulting in the seminal Hauora series of publications and inequity-focused journal articles.

Inequity is now a routine focus of descriptive health statistics in the Ministry of Health's National Collections datasets. These publications highlight the fact that health inequities in Aotearoa New Zealand are both pervasive and persistent; despite Government policy to reduce health inequity throughout the 1980s and 1990s, little (if any) improvement was made over the last 20 years.

<sup>7</sup> PwC New Zealand. 2021. *The Economic and Social Cost of Type 2 Diabetes*. PwC New Zealand.

<sup>8</sup> Te Rangihira. 1914. The smallpox epidemic among Maoris in the Northern District. *Australasian Medical Congress, Transactions of the Tenth Session 1914*, 212-24.



## 1. Culturally engaged health programmes and resources

### Kimi Ora and Poutiri Health Challenge



The He Pikinga Waiora (HPW) project aimed to find out how to create effective health programmes for Māori. The team developed the He Pikinga Waiora Implementation Framework as a tool for planning, implementing and evaluating new health programmes, and used it to co-design, implement and evaluate two separate community-based programmes.

- Kimi Ora was delivered by Te Kōhao Health, a Māori health provider in an urban, marae-based setting in Hamilton, in partnership with researchers Dr Nina Scott (Health New Zealand Te Whatu Ora, Waikato) and Dr Bridgette Masters-Awatere (University of Waikato). It consisted of a ten-week programme for people with pre-diabetes, newly diagnosed diabetes or obesity. The participants during the research phase were mainly women. They received two weeks of screening followed by eight weeks of intensive, structured lifestyle activities (delivered from a te ao Māori worldview) and shared healthy kai.
- The Poutiri Health Challenge was delivered by the Poutiri Charitable Trust, which provides Māori health and wellbeing services across the Bay of Plenty region, in partnership with researchers Professor John Oetzel and Dr Moana Rarere (both University of Waikato). The Health Challenge was a 12-week physical activity and nutrition programme for men living in Whakatāne who were at risk of type 2 diabetes, CVD or obesity. The health system had not engaged constructively with these men before, so many of them had a range of unmet health needs and low levels of trust in the health system. Kaiārahi (community health workers) were employed to help participants navigate the health system by providing guidance, advocacy, and support to attend appointments.

Both programmes offered lifestyle interventions focused on improving access to healthy nutrition and physical activity that were holistic, community-centred and inclusive of whānau (extended family and friends). Both also offered screening for a range of health conditions and linked participants with relevant health and social services.

#### Key findings

The high level of community engagement through the co-design process was a crucial factor in both programmes achieving outstanding retention rates. Kimi Ora had 100% retention and the Poutiri Health Challenge had 97% retention, demonstrating that co-designed programmes can be very popular with participants.

Both interventions achieved significant improvements in clinical markers of health. Kimi Ora resulted in reductions in weight (4.3%), BMI<sup>9</sup> (1.80) and HbA1c<sup>10</sup> (8%). The weight and BMI reductions were greater than a comparison group (HbA1c measures were not available for the comparison group). The Poutiri Health Challenge resulted in reductions in weight (4.7%) and BMI (1.87), and an improvement in health-related quality of life and self-rated health. There was no comparison group, but the effect sizes were large.

<sup>9</sup> BMI or Body Mass Index is a measure of body fatness used to indicate the likelihood (or risk) of developing health conditions related to obesity.

<sup>10</sup> HbA1c or glycated haemoglobin is a measure of blood glucose control used to help diagnose type 2 diabetes.

As well as improving clinical markers, the research led to greater understanding of how to harness community involvement so that interventions and treatment programmes are more readily adopted and sustainable beyond the research phase.

**Implementation**

Delivery of both programmes continued beyond the research phase. More than five years on, Kimi Ora has been re-configured as an eight-week programme that continues to be offered as an integral part of Te Kōhao Health’s suite of health and wellbeing services to help whānau lead healthier, more active lifestyles.

**Kaupapa partner perspectives**

Te Kōhao Health and Poutiri Trust were full partners in this research, which was key to the success of the programmes that were co-designed. The Poutiri Health Challenge had ambitious goals and strong indicators of success but was ultimately not sustained. Nevertheless, its potential was recognised:

*What we did initially with the group down there was amazing. If that would have got off the ground it would have got huge traction and that was no fault of anyone; it was again the environment at the time. But I think that approach and how you guys [academic researchers] approached it in accordance with your framework, perfect.*

**Poutiri Trust community researcher**

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Kimi Ora was sustained over time and a key factor was the strong partnership between the He Pikinga Waiora research team and Te Kōhao Health:

*This project has been a great collaborative approach between HPW and Te Kōhao Health. The value of this partnership is the alignment to the kaupapa – it having like-minded people working together with the intent and drive to make positive sustainable health changes and turn the curve of diabetes for Māori.*

**Te Kōhao Health community researcher**

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## Mana Tū: A whānau ora approach to long-term conditions

Māori and Pacific Peoples comprise a high proportion of those with poorly controlled diabetes who present at hospital with complications that require significant levels of care, such as dialysis, limb amputations and treatment for blindness. General practitioners (GPs) can struggle to help this group of patients, who need more attention than a GP can offer within a short appointment slot. As a result patients are often left to their own devices as their HbA1c levels creep higher.

To address this gap in care, the National Hauora Coalition, a Māori-led primary health organisation, introduced the Mana Tū programme to improve delivery of services and health outcomes for people living with poorly controlled type 2 diabetes<sup>11</sup> and their whānau. Mana Tū was co-designed with whānau, clinicians, health service planners and whānau ora providers.

Mana Tū employs Kai Manaaki as case managers or health navigators to help patients and whānau manage their own health. The Kai Manaaki are embedded within general practice teams and supported by a central hub. Their skills and experience range from those of nurses to social workers, psychologists and community health workers with diabetes experience. Their role extends from clinical input to enabling access to a holistic range of support systems, including those addressing the social determinants of health. A key philosophy of the Mana Tū programme is to empower people to set their own health goals so they feel valued through this process and can eventually manage their health independently.

This study, led by Associate Professor Matire Harwood (University of Auckland), evaluated the effectiveness of Mana Tū in a 12-month cluster randomised controlled trial of 400 participants across ten GP clinics. Qualitative research explored the patient and whānau experience of Mana Tū from an Indigenous perspective, including its acceptability and adoption.<sup>12</sup> The primary clinical outcome measure for the trial was HbA1c; the secondary measures were blood pressure and lipid markers.

### Key findings

The trial demonstrated significant improvements in five of six 'domains of change' that are closely related to effective chronic disease management: nutrition, self-management, physical, health literacy, cultural safety and smoking. Only the last of these showed no change.

One of the biggest changes was an increase in the amount of fruit and vegetables consumed daily by Mana Tū participants. They also increased their level of physical activity by 10% on average. By far the biggest increase was in their sense of cultural safety and readiness to engage with health and social services, which rose by 84%.

Over two thirds of the intervention group had some reduction in HbA1c over the 12-month period, but the difference between the intervention and control groups was not statistically significant. There was little change in blood pressure, low density lipoprotein (LDL) or high-density lipoprotein (HDL) and no difference between the intervention and control groups. The observed change in HbA1c was comparable to changes found in systematic reviews of chronic disease management programmes.

<sup>11</sup> Poorly controlled type 2 diabetes was defined as having an HbA1c level greater than 65.

<sup>12</sup> The Mana Tū evaluation was funded by the Long-Term Conditions Partnership established in 2017 between the Ministry of Health, the Health Research Council of New Zealand and Healthier Lives – He Oranga Hauora National Science Challenge.





The evaluation found that the Mana Tū programme had a positive impact on the lives of participants. Importantly, there was a clear improvement over time in their confidence to achieve goals and in feeling empowered to do the work needed to achieve future goals.

### Implementation

The National Hauora Coalition continues to operate the Mana Tū programme at GP practices in West, Central and South Auckland. It plans to increase the scope from diabetes to other long-term health conditions, and from adults only to adults and children, including those living with rheumatic heart disease.

There is considerable interest in wider use of health navigators within primary care, and this is likely to become a feature of New Zealand's health service in future.

### Kaupapa partner perspectives

Kai Manaaki contributed to a stronger team environment at GP practices:

*Before I came in, they [the clinicians] all worked in silos ... but I'm really sociable so naturally started doing things with them socially and it kind of weaved the team into a stronger position. I almost started doing social work with the team ... and it worked because we're really close as a team now and you can see that in the way we work with patients.*

#### Kai Manaaki

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The role and importance of Kai Manaaki was highly valued at GP practices, such that teams looked at ways to keep these positions going after the study finished:

*I think really what [the Kai Manaaki] showed was what I suspected, that we only see the tip of the iceberg. And she saw underneath, the incredible social chaos and need.*

#### General practitioner

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Kai Manaaki also facilitated a smooth transition for patients to other related clinic programmes, providing context and a coordinated approach:

*It was great, because it was culturally adept, it was nimble, and the flexibility. And it also, the joy, I think the genius of the Kaiarahi [health navigator], particularly because we know them, is that they pull us up when we can overlook things in our hurry, they'll go, nah, look at this.*

#### Clinic worker

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# Pasifika Prediabetes Youth Empowerment Programme

The 2021 *Economic and Social Cost of Type 2 Diabetes* report, commissioned by Healthier Lives and others, showed that Pacific Peoples living in New Zealand have a diabetes prevalence of 15%. This is projected to reach 25% by 2040.

The Pasifika Prediabetes Youth Empowerment Programme (PPYEP), led by Associate Professor Ridvan Firestone (Massey University), aimed to develop effective community-centred programmes for preventing type 2 diabetes, specifically by empowering Pasifika youth to be health advocacy leaders.<sup>13</sup>

PPYEP developed a collaborative partnership between researchers and two Pacific community-based health service providers: South Waikato Pacific Islands Community Services (SWPICS) in Tokoroa and the Fono Health and Social Services in West Auckland. Through these partnerships, a programme was delivered to empower youth to co-design, facilitate and evaluate a diabetes prevention intervention using Pasifika models of health and mental wellbeing.

Pacific youth with identified leadership potential learned about the factors that predispose people to prediabetes. They acquired the skills to co-design a prediabetes prevention programme with a focus on improving physical activity and health literacy. The empowerment programme for youth was co-delivered by university and community-based researchers, while the prediabetes prevention programmes in each community were delivered by youth, who also collected the research data.

### Key findings

The young people were very effective in mobilising their community, which resulted in a high retention of participants (81% completed the prediabetes prevention programmes). Participants showed statistically significant improvements in several key health parameters (2.4% decrease in body weight, 1.6% decrease in waist circumference and an increase in the average number of daily steps), even though the programmes ran for a relatively short period of eight weeks.

### Kaupapa partner perspectives

The partnership between university researchers and Pacific community-based health service providers was essential to this study. It built community researcher capability and led to new research projects with the SWPICS in Tokoroa.

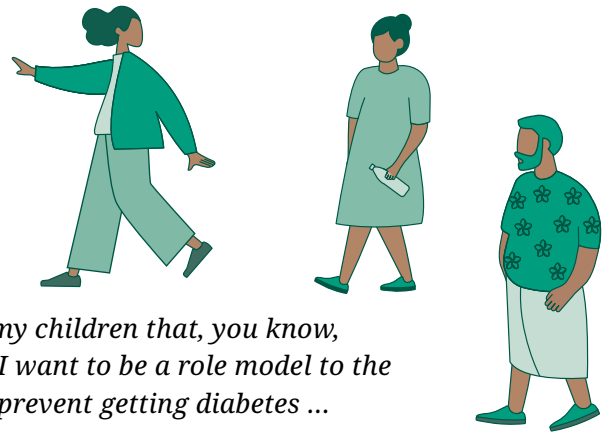
The programmes designed by the young people led to positive health outcomes for members of their community:

*One participant continued the walking and now she looks amazing! She is still continuing that today because she was on that line of being prediabetic – she didn’t want to go there! People who saw the change in her, like her sister, said “this programme has changed my sister’s future”. The eight-week challenge that this group of young people created has made an actual lifetime change for someone. That’s an awesome outcome for us.*

### SWPICS staff member

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13 The PPYEP study was funded by the Long-Term Conditions Partnership established in 2017 between the Ministry of Health, the Health Research Council of New Zealand and Healthier Lives–He Oranga Hauora National Science Challenge.



Participants gained new knowledge that they were able to share with their families:

*I want to be healthy so I want to show my kids, my children that, you know, this is the best way to go, you have to take care, I want to be a role model to the rest of my family, this is the way we need just to prevent getting diabetes ...*

.....

*It was free, free to participate and not only that, having those marvellous fruits after classes.*

.....

*What worked for me, it was to be active with my age group, catching up with people and just being able to motivate myself and motivate other people on this walk.*

.....

*Ever since [attending the programme] I'm losing weight up to 5kgs now. I'm trying to maintain that.*

.....

*What I liked [about] this intervention programme ... is you get to understand the importance of healthy living. Making sure that you're committed to your diet and all the important things in life to be able to continue on with your lifestyle.*

.....

*I ended up bringing my mum as well as my own children [to the programme] ... That's what I liked about it, you can bring anyone, don't have to worry about babysitter, make them walk it's all good. I love that I showed my mum as well 'cause she does walking but she doesn't walk in a group ... And it also showed myself with my children that they just like spending time, that quality time with me and so I just love that it hit all aspects in one thing.*

**Study participants**

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**Implementation**

Evaluations of the programme showed the importance of trust and reciprocity in community partnerships, the capacity and capability of youth advocacy, and the importance of community-centred and culturally relevant programmes. After the study, some young people went on to design and implement new health interventions independently in their communities.

The learnings from PPYEP directly informed a new study, the Oire Tokoroa Family Lifestyle Diabetes Prevention Programme, which again used the concept of health advocates. This time, however, the champions were key members of the family unit and the programme was based around intergenerational activities that involved the whole family.

## Oire Tokoroa Family Lifestyle Diabetes Prevention Programme

The six-month Oire Tokoroa Family Diabetes Lifestyle Programme, led by Associate Professor Ridvan Firestone (Massey University), was co-designed with SWPICS. The family focus of Oire Tokoroa emerged as a priority during a workshop to scope Pacific-led research in the second phase of Healthier Lives. It acknowledged the central role of vaevae orooro (family champions) in supporting Pacific families.

Twenty vaevae orooro attended empowerment training sessions (adapted from PPYEP modules) to build their knowledge and leadership skills, and they became the driving force behind family actions to prevent diabetes. To facilitate cooking and eating meals together, family groups co-created an intergenerationally friendly Pacific cookbook with 16 culturally appropriate (and dietitian-reviewed) recipes. The local supermarket agreed to stock the food needed for the recipes, leading to new food items becoming available to the whole community.

The meal ingredients were provided for families in a food bag named 'Kai Tari', a humorous and positive take on the idea of a 'doggy bag'. Over the 16-week period, families were provided with Kai Tari food bags containing the ingredients for four family meals each week. Family exercise activities were developed and led by vaevae orooro, along with exercise cards to assist families to undertake physical activities at home. At a Family Information Day and final talanoa (conversation), the community received input from Pacific diabetes professionals and reflected on the study findings.

### Key findings

During the Oire Tokoroa programme, families improved their nutrition and budgeting knowledge and learnt new ways to prepare healthy meals. Children helped with meal preparation and improved their literacy skills through reading recipes. Social media such as Facebook and TikTok were used to share meal preparation tips and organise fun activity nights with other families.

Doing things together as a family was hugely valued. Even after the programme finished, families continued to use the cookbook and meet with other families they had developed connections with during the programme. One vaevae orooro used a recipe from the book to lead a cooking demonstration at a local Healthcare Expo, and the book is being reprinted to meet demand from other communities who have heard about it.

An important outcome of this study was the increased knowledge around type 2 diabetes, which resulted in more culturally relevant wrap-around support for those living with diabetes as the families developed a better understanding of the disease.

### Implementation

The family-centred empowerment model used in the Oire Tokoroa programme was adapted for use in the Fanau Manuia programme in Wellington, funded by A Better Start National Science Challenge, to prevent prediabetes in children. Longer-term interventions using the family-centred empowerment model are now required to detect meaningful changes in risk factors for type 2 diabetes.



## **Kaupapa partner perspectives**

A vital factor in the success of Oire Tokoroa was the central role of the community health provider SWPICS. In turn, the project provided opportunities for developing the skills of community members. One youth intern who worked on the project and some of the vaevae orooro are now employed by SWPICS.

The SWPICS employee who led the empowerment sessions was crucial to the delivery of this community-led programme. Through her work she was able to see its long-term effects:

*The vaevae orooro continue to make healthy choices today. We did have one of our vaevae orooro who ... liked fizzy drinks prior to joining the programme, joined the programme ... and today still drinks water, still provides her family with water ... and her children still make meals from the Kai Tari cookbook.*

### **SWPICS staff member**

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The Kai Tari Cookbook contains recipes based around familiar, much-loved Pacific flavours. The ingredients were adapted with advice from a dietician, such as using low-fat coconut milk and reduced salt. Some unfamiliar ingredients were included to keep meals economical.

*My family and I were a bit sceptical because of the chickpeas, but they pretty much disintegrated into the curry and no one even knew they were in there.*

.....

*The book is marvellous. Also have my daughter-in-law that lives with us, who's not really a cook. With that book, now, she's quite confident that she's a cook now. That's also helped her to navigate her way around using ingredients that she wouldn't think that she would like.*

.....

*We had an expo a couple of months ago and we featured Kai Tari ... A lot of positive feedback. A lot of people asked to buy the cookbook.*

.....

*This has been so good for me because everyone else on this chat knows that sis can't cook. It's been really cool to just see everything broken down and it's a lot more relatable to who we are as Pacific people.*

### **Vaevae orooro**

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Study participants also enjoyed exercising as a family and saw the benefits of it:

*Doing it [exercise] as a family helps, because it helps with accountability, and doing community physical activities makes it easier to do too.*

*For me personally, it wasn't even about the exercise. It was about me spending time with the kids. Sometimes I don't balance my life very well. I work a lot more than I do being at home with my children. I think being able to go on a walk and listen to them tell me about their day really meant a lot.*

### **Vaevae orooro**

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Māori and Pacific communities in New Zealand are affected disproportionately by diseases that can be prevented and managed through lifestyle changes. Research shows that mobile phone-delivered (mHealth) programmes can improve people's motivation to make positive lifestyle changes, leading to better health outcomes.

This project developed and tested OL@-OR@, a culturally tailored smartphone app to support healthy lifestyles for Māori and Pasifika in New Zealand. The app allows users to set goals, invite whānau and friends to join them on their journey to achieve positive lifestyle changes, and track progress as individuals and communities. It contains spiritual wellbeing, healthy eating and physical activity content and uses proven tools and techniques to support behaviour change, such as goal setting, social support and regular motivational messages and tips.

The project was co-led by three university-based researchers – Professor Cliona Ni Mhurchu (University of Auckland), Associate Professor Ridvan Firestone (Massey University) and Professor Lisa Te Morenga (now Massey University) – in partnership with three community-based health providers: Toi Tangata, the Fono Health & Social Services and SWPICS.

To our knowledge, it was the first research project anywhere in the world to co-design and evaluate an mHealth programme in partnership with Indigenous and minority populations. It began with a year-long co-design phase that involved a series of focus groups, hui and fono (meetings) to design the direction and content of the programme. The communities decided which form of mHealth programme to develop and came up with detailed ideas about its content and functionality. Community members were then involved in testing and providing feedback on prototype designs.

OL@-OR@ was evaluated in a large-scale randomised controlled trial involving 69 communities and 1,451 Māori and Pasifika participants. A 12-week follow-up questionnaire was completed by 1,224 (84%) participants. The community partners were actively involved in the design of the trial, interpretation of trial findings and dissemination activities.

### Key findings

The results of the trial showed improvements over time in adherence to health-related behaviours, such as increased physical activity and fruit and vegetable consumption, in both the intervention and control groups.<sup>14</sup> The strong engagement of community coordinators with both groups most likely explains the lack of significant differences in overall outcomes between the two groups.

Within the intervention group, not all trial participants actively used OL@-OR@. However, those who set behaviour change goals showed significant improvements compared with the control group. These findings suggested that app-based programmes are not effective for everyone but may support behaviour change in those motivated to engage with them.

To achieve noticeable impact at a population level, effective government policies are needed to create environments that make healthier choices an easy choice for most people. However, it is also important to support and empower individuals who are looking to make personal lifestyle changes, and this evaluation showed that OL@-OR@ is a potentially valuable tool for Māori and Pacific Peoples.

<sup>14</sup> Ni Mhurchu, C., Te Morenga, L., Tupai-Firestone, R., Grey, J. et al. 2019. A co-designed mHealth programme to support healthy lifestyles in Māori and Pasifika peoples in New Zealand (OL@-OR@): a cluster-randomised controlled trial. *The Lancet Digital Health*, 1(6), e298-e307. [https://doi.org/10.1016/S2589-7500\(19\)30130-X](https://doi.org/10.1016/S2589-7500(19)30130-X)

## Implementation

When communities invest their time and energy in research, it is important for them to see a tangible outcome with lasting benefit. At the completion of the research phase in 2019, Healthier Lives made a further investment to fund the maintenance of OL@-OR@ for three years to enable different implementation approaches to be trialled.

A kaitiaki group was established and a business model was developed to cover the costs of ongoing app maintenance and ensure that OL@-OR@ remained free to end users. Unfortunately, community-based organisations could not afford the relatively modest licence fee.

Another approach to implementation was tried to test whether a grassroots marketing campaign could generate sufficient consumer demand for OL@-OR@ to warrant interest from other potential funders. This campaign coincided with the immediate aftermath of the Auckland Covid-19 lockdown (a difficult time), but nevertheless resulted in a significant increase in users over six months. Although this demonstrated OL@-OR@'s potential, it also revealed the need for further investment to improve technical aspects of the app and update its content.

Healthier Lives wrote a report to share its experience with the Ministry of Health in the hope that this would inform future mHealth policy and research funding strategies. The report concluded:

*Implementing research-based mHealth programmes is inherently difficult in Aotearoa New Zealand, regardless of whether there is evidence of their efficacy and despite relatively modest costs. The two main barriers to implementation are: lack of funding for ongoing maintenance and regular updates to mHealth programmes beyond the research phase; and the absence of an agency responsible for implementing new health technologies and guiding the best approach.*



The OL@-OR@ research team

At the time of writing, several community-based health providers have expressed new interest in using OL@-OR@ within pilot programmes being run through the Healthier Lives Implementation Network. Healthier Lives extended funding for the maintenance of the app to support these pilot programmes, but ongoing funding will be required to make the app available into the future.

**Kaupapa partner perspectives**

The strong, positive and ongoing relationships built between university researchers and community-based health providers was an achievement in itself, as testified by the desire of community partners and local communities to work together with academics on future research projects:

*When we talk about partnership, there is partnership that is written on paper, but there’s also the partnership that allows us ... a real, organic approach to how we develop relationships, and that’s certainly been evident from the framework that Healthier Lives has been able to accord us in the relationship that we have developed with Auckland University, and being able to co-design a pilot and trial.*

*[In the co-design process] we never lost who we were but were able to grow and develop under a model that allowed us to determine what wellbeing looked like for us. We began a process here that asked: ‘what are our dreams and aspirations for our community?, what does good wellbeing look like?’ and to unpack all of that has been ... invaluable.*

**Akarere Henry, CEO, SWPICS**

.....

OL@-OR@ won two bronze awards at the 2019 Designers Institute of New Zealand Best Design Awards and users appreciated its cultural design:

*I love the Māori designs on it. Even opening it, you’ve got a Māori waka there.*

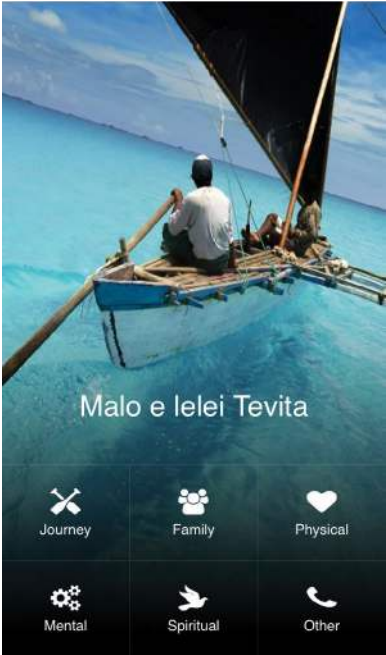
**Māori study participant**

.....

*We hold our culture very close to our heart, so when you open something and you can relate to it, you know that’s a bonus for us.*

**Pasifika study participant**

.....





## Te Kāika DiRECT

New Zealand's rate of diabetes is amongst the highest in the world. A 2021 report, *The Economic and Social Cost of Type 2 Diabetes*, commissioned by Healthier Lives and others, modelled the potential impact of several health interventions that could benefit people with established diabetes in New Zealand. One of these was a dietitian-supported programme involving rapid weight loss followed by a longer weight-loss maintenance phase, known internationally as the Diabetes Remission Clinical Trial or DiRECT approach. In other countries, this form of weight loss had been shown to achieve remission of type 2 diabetes, reducing the risk of related conditions such as cardiovascular disease and diabetes-related chronic kidney disease, retinopathy, nephropathy and lower-limb amputation.

While the findings from DiRECT studies stimulated great interest worldwide, their acceptability and feasibility in Aotearoa New Zealand had not yet been investigated. Healthier Lives therefore co-funded a feasibility study, led by Dr Andrew Reynolds, Associate Professor Justine Camp (both University of Otago), and clinician Dr Kim Ma'ia'i (formerly Te Kāika Health), to test the DiRECT approach in Aotearoa. It was conducted in partnership with Te Kāika Health, a Māori primary care provider in South Dunedin that serves a Māori, Pacific, refugee and low-income clientele.

The Te Kāika DiRECT study recruited 40 participants with obesity and prediabetes or type 2 diabetes who were looking to lose weight. Of these, 40% were Māori and 40% Pasifika. Participants were randomised to either one year of dietitian-supported usual care or the DiRECT approach to weight loss (three months of total meal replacement (~3400kJ per day) followed by nine months of supported weight loss maintenance).

### Key findings

After twelve months, participants in both groups had lost weight, but the DiRECT group lost over 3.8kg more on average than those in the dietitian care only group. This was despite the latter receiving the same level of dietitian support, a free gym membership and grocery vouchers to help them purchase the foods promoted by the dietitian. There was a 30% dropout of participants by three months, but this was due to factors other than the study itself.

Beyond weight loss, DiRECT participants improved their blood sugar control, an important outcome for those with diabetes as it indicates a reduced likelihood of downstream complications and premature mortality. Before the study, participants spent around 10% of their day in normoglycaemia (the normal or desired range for blood sugar levels). After three months, this increased to 78%, compared with 48% for those receiving usual care. DiRECT participants also had lower blood pressure levels and medication use than the usual care group.

Alongside monitoring clinical health markers, a qualitative study was undertaken to understand participant experiences. Among participants in the DiRECT group there was a feeling that they were doing something special. They reported that the radically new diet became easier and more acceptable within one week and felt worthwhile when they noticed rapid improvements in their weight and mood.

One of the major themes that emerged from the qualitative study was the invaluable support of the dietitian in helping people in both arms of the study to make changes towards a healthier lifestyle. As well as working with individual study participants, the dietitian worked with their whānau and extended family, which created an additional layer of support.

**Implementation**

The findings of this feasibility study indicated that the DiRECT approach is effective and acceptable for people in Aotearoa. A nationwide network of Māori and Pacific healthcare providers has been assembled to apply for funding to conduct a larger trial.

**Kaupapa partner perspective**

The Te Kāika DiRECT study was initiated when GP Dr Kim Ma`ia`i approached researchers for ideas about how to better support the increasing proportion of his patients seeking help to manage type 2 diabetes and obesity. For him, the study offered new ways to help his patients:

*Having a dietitian on site at the clinic who I could work with as a sort of ‘partner in crime’, I’d have to say has been one of the highlights of my career ...*

**Dr Kim Ma`ia`i, GP**

.....

For study participants who had been wanting to lose weight for some time and who achieved clinically significant results using the DiRECT approach, it was also a positive experience:

*If I do it I can help my family, and my family’s my first priority.*

.....

*You actually saw results relatively quickly, so it was encouraging for you to keep going.*

.....

*It wasn’t as hard as I expected.*

.....

*You’ve got a plan, and you see results quickly and those results motivate you to keep going.*

.....

*How has it made me feel? It’s made me feel great about myself.*

.....

*I can do this on my own now.*

.....

*This study has just allowed me to actually hone in on that long-term lifestyle change, as opposed to quick fixes.*

**Study participants**

.....



## 2. Embedding equitable outcomes within the health system

### He Pikinga Waiora: Making health interventions work for Māori communities

Despite persistent inequities in health outcomes for Māori, the evidence used in developing new health programmes is often drawn from research studies of a non-Indigenous population and doesn't always reflect the lived experience of Māori communities. Even when there is clear evidence of steps that could be taken to improve Māori health, factors ranging from systemic inertia to institutionalised racism can lead to inaction within the health system.



The He Pikinga Waiora project, led by Dr Nina Scott (HNZ, Waikato), Professor John Oetzel and Dr Bridgette Masters-Awatere (both University of Waikato), in partnership with community-based health providers Te Kōhao Health and Poutiri Trust, wanted to find out what makes health programmes work effectively for Māori and how evidence can be translated into action. While co-designing new health programmes in two Māori communities, the project explored the role of community partnerships and matauranga Māori in developing sustainable, effective, evidence-based health interventions.

As a result of this work, a framework was developed to guide the process of planning, implementing and evaluating new health programmes for Māori. The He Pikinga Waiora Implementation Framework, which integrates kaupapa Māori, systems thinking, community engagement and implementation science, was designed to support improvements in health service delivery that will lead to equitable health outcomes.

The framework, and an accompanying toolkit,<sup>15</sup> is a resource for health providers wishing to engage with Māori communities to translate research findings into health gains for Māori. It supports the autonomy and engagement of community organisations in such processes.

#### Implementation

The framework was widely disseminated and to date it has been used successfully in two national health screening programmes, research projects funded by the New Zealand Health Research Council and several National Science Challenges, teaching programmes at the University of Waikato, and health services in the Waikato region. Canadian researchers working with First Nation communities have also used it.

#### Kaupapa partner perspective

For those working within the health system, using the framework led to greater understanding of how to harness community involvement so that interventions, including screening and treatment programmes, are more readily adopted and sustainable beyond the research phase.



<sup>15</sup> The toolkit is available at the He Pikinga Waiora website: [www.hpwcommunity.com/](http://www.hpwcommunity.com/)

Māori health providers found the framework to be an effective tool for supporting meaningful engagement in co-design processes, which resulted in more lasting benefits for the community:

*Having that framework sets really strong measures. It's a proper framework that you can actually measure against. You don't have to do a lot of extra mahi to figure out whether what you're doing aligns with it.*

**Carey Manuel**  
COO, Poutiri Trust

.....

*He Pikinga Waiora in my mind is a kaupapa Māori community-led approach to engagement with Māori for the purpose of research. It emphasises partnership and participation in all aspects of the research journey from conception to completion and beyond. Working in this manner ensures something meaningful can be left behind for the community involved. It appeals to me personally because it gives Māori voices a right and not just a privileged segment in the journey.*

**Rangimahora Reddy**  
CEO, Rauawaawa Kaumātua Charitable Trust

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Cardiovascular disease (CVD) remains the leading cause of death in New Zealand, but many cardiac events are preventable. Māori and Pacific Peoples are less likely to receive treatment and more likely to die from heart disease than other New Zealanders, so understanding the barriers to accessing heart healthcare is important to help rectify these disparities.

Healthier Lives and Heart Foundation NZ co-funded research focused on equitable prevention and treatment of CVD. The Manawataki Fatu Fatu project set out to translate what we already know about heart health into more equitable health outcomes for Māori and Pacific Peoples living in Aotearoa New Zealand.

Manawataki Fatu Fatu, co-led by Associate Professor Matire Harwood (University of Auckland) and Dr Corina Grey (Ministry for Pacific Peoples), formed a multidisciplinary team to identify, quantify and understand the barriers to better heart health outcomes, and to develop practical solutions that could be implemented to improve outcomes for Māori and Pacific Peoples.

Three senior research fellows and seven postgraduate students contributed to the project. All were Māori and/or Pacific, and their involvement helped to build the capacity of a Māori and Pacific health research workforce and nurture the next generation of leaders. The team included diverse expertise from across the healthcare spectrum, including public health, primary health, nursing, paramedicine, speech and language therapy, epidemiology and communications.

In the initial stages of the project the team held several hui to bring together heart health researchers, clinicians, first-responders, funders and planners. This led to the creation of a national network of investigators undertaking research on equitable access to evidence-based heart healthcare. It cemented collaborations with Hato Hone St John's and Wellington Free Ambulance, the Cardiac Network, teams from Health New Zealand Te Whatu Ora and Te Aka Whai Ora, and heart health research groups based at the University of Auckland.<sup>16</sup>

The quantitative arm of the programme used hospitalisation, ambulance and other routinely collected data to identify and quantify equity of access to care across the heart health spectrum, including in CVD risk assessment and management, and in access to paramedic and hospital care.

The qualitative arm of the programme captured stories of people's journey through the health system and their ideas for how it could be improved. Team members conducted in-depth kōrero and talanoa (conversations) with patients, whānau and kaimahi (health providers) to better understand the barriers to accessing care, to ensure that the research would be mana-enhancing by elevating the voices of patients and whānau in healthcare planning.

### **Key findings**

A key finding from the programme was that, in order to deliver and sustain equitable care, the capacity and cultural safety of Māori and Pacific heart health researchers needs to be increased [to build a workforce that is representative of the population it serves.

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<sup>16</sup> These research groups include: Manaaki Manawa | The Centre for Heart Research; Pūtahi Manawa | Healthy Hearts for Aotearoa New Zealand Centre of Research Excellence; and the Vascular Risk in Adult New Zealanders (VARIANZ) Studies.



Qualitative research with whānau further illustrated the importance of strengthening the Māori and Pacific heart health workforce to deliver culturally appropriate and excellent care. Māori and Pacific people want to take charge of their heart health but face challenges. Participants described important obligations to family, community and tikanga (the culturally correct way of doing things). They also described times when healthcare undermined these existing responsibilities, their dignity and/or their mana such that they felt excluded from treatment.

Quantitative analyses demonstrated that Māori and Pacific people who do not have diabetes are less likely to be risk assessed for CVD compared with Europeans, despite their higher risk of CVD. Among Māori, these inequities persisted for those with diabetes. In addition, emergency medical services (EMS) data analysis showed that Māori and Pacific are less likely to have used EMS than European New Zealanders.

Through hui and systematic reviews, the team identified areas of heart healthcare that could be improved to address inequities. Discharge planning was one such area. One team member developed a comprehensive picture of current discharge planning for people with heart failure in New Zealand public hospitals, and scoped out a new discharge process designed to meet the communication needs of Māori and Pacific patients and their care in the community.

### Implementation

The Manawataki Fatu Fatu research programme created a Quality–Improvement–Equity Roadmap as a living plan for the health system, to focus attention on the gaps between evidence and practice. The national leadership roles of Manawataki Fatu Fatu team members in the heart health sector will enable the roadmap to have an enduring impact on future service improvement.

## Supporting the health system to implement interventions and improve health equity



Some health inequities arise from well-documented differences in access to and quality of healthcare. Implementation Science offers a structured way to address this by building an explicit focus on equity into frameworks and tools to guide the design and implementation of health services.

The Health Systems Change research team led by Professor Sue Crengle (University of Otago) developed the Framework for Effective and Equitable Implementation in Aotearoa (FrEEIA) and the FrEEIA readiness assessment tool for use across the health sector, including HNZ, general practice and primary health organisations, pharmacy, hauora Māori providers, and non-governmental organisations.

These tools were developed through collaboration with HNZ, following a review of international best practice and adaption and refinement of existing models through iterative engagement with consumers, stakeholders, researchers and the project's Kāhui Māori.<sup>17</sup>

<sup>17</sup> FrEEIA was adapted from the Equity-based framework for Implementation Research (EquIR); the FrEEIA readiness assessment tool was adapted from the Wandersman Center 'Readiness Thinking Tool'.

FrEEIA establishes principles to guide both the design of the implementation pathway and the implementation process itself. It places whānau aspirations and needs at the centre of the process, recognises the determinants of health, and is underpinned by a commitment to collaborative design with the people who will experience a health programme, as well as those involved in delivering it.

The FrEEIA readiness assessment tool is designed to help teams initiate the implementation of new health programme or review the performance of an existing programme to ensure it delivers equal outcomes. Based on the concept of 'organisational readiness' (used in organisational psychology, project management and quality improvement), it is a quick survey that each team member completes to lay the groundwork for team discussion and creation of an action plan.

**Key findings**

The research team tested the FrEEIA readiness assessment tool with multidisciplinary teams in HNZ, including teams responsible for service planning and those involved in the implementation of lung cancer screening in Auckland and Waitemātā. The preliminary findings showed that use of this tool:

- helped teams develop a better understanding of equity readiness and the different dimensions to consider
- was reasonable in terms of the time commitment required
- was useful to a range of groups for demonstrating readiness to implement or scale up interventions, e.g. funders and iwi partners, and
- had added benefit as a team-building exercise.

**Implementation**

Several steps were taken towards embedding the use of FrEEIA and the FrEEIA readiness assessment tool in the health system. The research team appointed a stakeholder group to build awareness of the new resources at senior levels in the health sector, planned further testing of the resources in the disability and policy sectors; and ran Implementation Science masterclasses and workshops for healthcare policymakers, planners and providers.

**Kaupapa partner perspective**

Māori consumer groups and the project’s Kāhui Māori were integrally involved in adapting and refining FrEEIA and the FrEEIA readiness assessment tool for use in Aotearoa New Zealand and contributed regular feedback on changes and improvements to both. A Senior Health Leaders and Researchers Stakeholder Group was convened to canvas opinion and offer feedback about their usefulness in the wider health system. Members of this group, who will have an important role in building awareness to assist with uptake of the framework and assessment tool, saw value in them:

*This is important work and getting the [FrEEIA readiness assessment tool] into mandatory usage (in the system) would be important.*

.....

*The [framework and readiness assessment tool] could be applied in policy settings or even in developing analytical frameworks for monitoring and evaluation of the health system.*

.....

*The user friendliness and simplicity of this tool is great.*

**Members of the Senior Health Leaders and Researchers Stakeholder Group**

.....

### 3. Utilising data to prioritise health interventions

#### Capitalising on New Zealand's health data

New Zealand has one of the world's richest sources of linked data, available to researchers in anonymised form through the Statistics New Zealand Integrated Data Infrastructure (IDI).<sup>18</sup> These data have enormous potential to answer research questions about the health of our population.

This study, led by Dr Andrea Teng (University of Otago), created linked data sets to identify traits that can either reduce or increase the risk of a person with prediabetes progressing to type 2 diabetes. Three groups joined forces to carry out the research: the National Hauora Coalition (a Māori-led primary healthcare organisation), researchers from the He Pikinga Waiora project, and big data experts from the Virtual Health Information Network (VHIN).

A sample of 14,000 patients enrolled with the National Hauora Coalition in the upper North Island were retrospectively observed from the time they were diagnosed with prediabetes to see if they progressed to developing type 2 diabetes. The researchers linked anonymised data on each patient's HbA1c level and BMI to government health, census and social datasets held within the IDI, enabling them to look at progression rates by age, sex, ethnicity and socioeconomic status.

This was the first time that data from a primary healthcare organisation had been linked with other data held in the IDI, a milestone achieved through close collaboration between the National Hauora Coalition, Statistics New Zealand and researchers.

#### Key findings

The study identified several factors associated with increased risk of progression from prediabetes to type 2 diabetes: being younger, being male, having a higher level of HbA1c and having a higher BMI. It also identified factors associated with *reduced* risk of progression: having a healthy weight, being female and being older.

The research found that Māori and Pacific Peoples had a greater rate of progression from prediabetes to type 2 diabetes than the rest of the population. This was likely because they had more advanced prediabetes (as indicated by higher HbA1c levels) at the time that it was diagnosed.

Notably, however, the study found a correlation between a patient's ability to speak te reo Māori with a 19 to 88 percent lower progression to type 2 diabetes, independent of age, sex, income, education, deprivation, ethnicity and HbA1c.

This novel and intriguing finding suggests that being able to speak te reo Māori could be a factor in preventing Māori with prediabetes from progressing to type 2 diabetes. It also suggests that language and cultural identity may be a positive and protective factor for health, particularly for Indigenous communities.

#### Implementation

The study's findings have been used to inform a review of New Zealand criteria for defining prediabetes and diabetes (underway at the time of writing), which will help prioritise interventions for those most at risk of developing this serious illness.

<sup>18</sup> The IDI is a research database containing linkable datasets of de-identified data about people and households relating to education, income, benefits, migration, justice and health. The data, which comes from government agencies, Statistics New Zealand surveys and non-government organisations, can be linked within the secure IDI data environment.



## The Economic and Social Cost of Type 2 Diabetes

New Zealand's rate of type 2 diabetes is amongst the highest in the world and contributes to the incidence of other major non-communicable diseases. For example, around 30% of New Zealanders with type 2 diabetes also have cardiovascular disease. Health inequities have resulted in diabetes mortality being 3.6 times higher for Māori than non-Māori and 9.1 times higher for Pacific Peoples than for those of European descent.

The lack of a national strategy or plan of action for type 2 diabetes prompted Healthier Lives to join forces with the Edgar Diabetes and Obesity Research Centre (EDOR), Diabetes New Zealand and philanthropists Tony and Heather Falkenstein to commission an investigation into the economic and human cost of type 2 diabetes in Aotearoa New Zealand.

PwC New Zealand undertook the study over 12 months in 2020, guided by regular meetings with the Directors of Healthier Lives, EDOR and Diabetes New Zealand and expert advice from national and international clinicians and researchers, the Ministry of Health, Statistics New Zealand, district health boards and community-based health providers.

Four possible interventions to prevent or manage type 2 diabetes were selected (based on robust research evidence) and modelling was undertaken to determine the costs and benefits of government investment in each of them: a lifestyle intervention to *prevent* type 2 diabetes; a lifestyle intervention to *achieve remission of* type 2 diabetes (DiRECT); new medications to manage type 2 diabetes; and better footcare screening to avoid lower limb amputations.

### Key findings

In 2018 there were ~228,000 people living with type 2 diabetes in Aotearoa New Zealand. This study found that the prevalence of this disease was expected to increase by 70-90% over the next 20 years. People of Pacific, Asian and Māori ethnicity were disproportionately represented among New Zealand's type 2 diabetes population, with the highest prevalence (15%) among Pacific Peoples. This was projected to increase to 18-25% over the next 20 years, meaning one quarter of Pacific Peoples living in Aotearoa New Zealand could have type 2 diabetes by 2040.

The total annual cost of type 2 diabetes (including the health costs, lost income and lost tax revenue) was estimated to be \$2.1 billion per year – 0.67% of New Zealand's Gross Domestic Product – and this was projected to increase to \$3.5 billion by 2040.

The results of modelling the four selected interventions showed that Government investment in each of them would protect lives, alleviate years of suffering and save the taxpayer hundreds of millions of dollars.

The PwC report made numerous recommendations, including the need to develop a 'national diabetes and associated long-term conditions strategy to...adopt and invest in a broad national package of interventions'<sup>19</sup>

### Implementation

*The Economic and Social Costs of Type 2 Diabetes* report was launched at Parliament in March 2021 by the Associate Ministers of Health Hon Peeni Henare and Hon Aupito William Sio. Press releases elicited widespread media and social media coverage of the report's findings, which continued for six weeks across national and regional media, revealing the depth of public interest

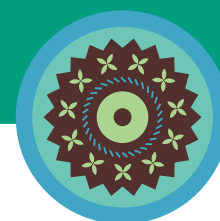
<sup>19</sup> PwC New Zealand. 2021. *The Economic and Social Cost of Type 2 Diabetes*. PwC New Zealand.

in this issue. Several health organisations issued statements in response to the report, and the report was frequently quoted in research literature and presentations.

One of the interventions modelled in the report, which can result in the remission of type 2 diabetes, was subsequently trialled in New Zealand as part of the Te Kaika DiRECT study, funded by Healthier Lives (see above). The study demonstrated that the DiRECT dietary intervention approach works in Aotearoa and is acceptable to Māori and Pacific families. The government also invested in two new classes of medication for treating type 2 diabetes.

In 2023 the Director of Healthier Lives, Professor Jim Mann, was asked to co-chair a HNZ working group to develop a national plan of action for diabetes. At the time of writing, consideration is being given to implementing some of the recommendations of *The Economic and Social Cost of Type 2 Diabetes* report.

## 4. Taking evidence into practice



### Healthier Lives Implementation Research Network

On average, it takes nearly two decades to translate scientific discoveries into real-world practices, and only a very small number (~15%) ever reach that point. For discoveries that relate to Māori and Pacific communities, it can take even longer. For these communities, new clinical practices and health programmes are often not translated in a way that is timely, culturally appropriate and acknowledges their right to self-determination. This increases health inequities.

To address this, the Healthier Lives Science Leadership Team proposed the development of a network among health providers and researchers to facilitate implementation of evidence-based health programmes to meet the health needs and aspirations of Māori and Pacific communities.

In the United States, around 100 practice-based implementation networks actively take innovative health programmes from the research arena into community practice. Prior to Healthier Lives' initiative, no similar infrastructure existed in Aotearoa New Zealand.

#### **The network**

Before deciding to establish a network, researchers formed a partnership with community-based health providers, undertook preliminary investigations and consulted leaders from across the health system to establish whether there was a need for such a network. This process identified not only a clear need but also strong interest, and offered guidance about how the network should operate.

The Healthier Lives Implementation Network was constructed through a co-design process involving more than 20 community providers, affiliated researchers and health system representatives. Separate Māori and Pacific branches were created, community researchers were hired to support each branch, and an advisory board of eight key stakeholders was appointed to provide guidance.

Following the wishes of community health providers, the network created a website with a dashboard to hold information about existing evidence-based health programmes and a hub space for members to share information. Monthly newsletters provided updates on research and funding opportunities to over a hundred affiliated network members.

One of the network's key principles was that Māori and Pacific communities should have control in determining their own health needs and aspirations, and in deciding which (if any) evidence-based health programmes to adapt for use in their community. The programmes highlighted through the dashboard therefore included, but were not limited to, those produced through Healthier Lives research. Their defining features were the ability to support community wellbeing, prevent a variety of health conditions, and improve health equity for Māori and Pacific communities.

### **The research**

Two strands of research were undertaken. The team conducted interviews with both Māori and Pacific health providers to explore their implementation needs and what they perceived as the barriers and facilitators to implementing research evidence. They also surveyed 80 researchers, health providers, and others with experience of implementing projects with Māori and Pacific communities. Through analysis of the interviews and surveys, the facilitators of implementation effectiveness were identified as leadership, relationships, sharing information, cultural alignment and community engagement. Barriers to implementation effectiveness included lack of funding, systems constraints and lack of cultural alignment.

The network then funded four pilot programmes to trial the adaption and implementation of evidence-based programmes. Community health providers in Rotorua, Kaitiāia, Tauranga and Auckland were supported to participate in these pilots through workshops to explain the programmes that could potentially be implemented and to help plan the implementation and evaluation of their chosen programmes.

Mixed methods research was conducted alongside the pilot programmes to improve understanding of what leads to successful implementation processes and outcomes. Participant engagement with the programmes was strong because providers were able to adapt the programme to fit their community. As a result, the effectiveness of the implementation process was also strong.

### **Kaupapa partner perspective**

To ensure that the network would be useful and enduring, kaupapa partners – leaders of organisations that might directly participate in the network or who had senior roles within the health system – were included in decision-making and goal-setting right from the start. Many groups saw the potential of the network. The Ministry of Health Long-term Conditions team provided financial support for the co-design process that resulted in the creation of the network. Others offered leadership to support it:

*This network has been instrumental in bridging the gap between research and practical implementation. It has allowed us to tailor health programmes specifically to the needs of our Pacific communities, ensuring that the interventions are culturally relevant and effective. The network's focus on evidence-based health programmes means that our community is receiving interventions that are proven to work. This not only improves health outcomes but also builds trust in health initiatives among our people.*

**Akarere Henry**

South Waikato Pacific Islands Community Services

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## New ways of doing research

For the last quarter of a century, research has documented health inequities in Aotearoa New Zealand but done little to alter them. Charting the scale and scope of these inequities was necessary and important, but Healthier Lives was determined to take the next step: to produce research-informed interventions to address persistent inequities.

The goal of health equity cannot be achieved by adding it to the end of a process; it must be addressed from the outset and at every stage along a research or service design pathway. In October 2016, Healthier Lives became the first national science challenge to adopt a co-governance model. This enabled equity principles to be placed at the heart of all its processes for commissioning, contracting, producing and disseminating research. Research topics were prioritised through hui and fono with Māori and Pacific community leaders; a process was introduced for community leaders to review research proposals at a formative stage; Māori and Pacific researchers led much of the research; and projects were authentically co-designed in partnership with Māori and Pacific communities.

Healthier Lives moved away from the traditional method of funding research with a pre-determined idea of what it would deliver, to funding partnerships between researchers and community organisations that would develop research-informed solutions within a particular context.

A kaupapa Māori evaluation of several projects that were co-designed in this way highlighted the benefits of a genuine partnership approach and distilled the lessons learnt through Healthier Lives' experience.<sup>20</sup> The report *Co-designing Health Research in Aotearoa New Zealand* and its accompanying short guide identified nine elements that reflect good co-design with, and as, Māori; and nine practical lessons that influenced the success of co-design research with Māori and Pacific communities. The report's authors, Dr Debbie Goodwin and Dr Amohia Boulton, developed the Co-Design Research Integrity Poutama, a model that conceptualises how the relationship between researchers and communities impacts the effectiveness of co-design processes.

Co-designing research within Healthier Lives generated new ideas through the partnership of diverse communities, health providers and researchers. This resulted in a broader foundation for knowledge and enabled the creation of novel health programmes and products that would otherwise have been impossible to develop or deliver. Healthier Lives' kaupapa partners are now aware of this way of working, and their expectations of future research have changed.

## Next steps

In the process of co-designing and evaluating a range of effective healthcare programmes for Māori and Pacific Peoples, Healthier Lives research challenged the way that the success of such programmes is measured. When working in partnership, predetermined ideas of success do not always match the aspirations of the partnership. When deciding what success looks like and how to measure it, honouring the *intent* of the partnership is vitally important.

Success in healthcare has typically been measured in terms of an improvement in markers of clinical health outcomes. However, health interventions designed to overcome longstanding health inequities may only realise such outcomes a long way into the future, perhaps over multiple policy cycles. As a country, we therefore need to identify steps along a pathway to those desired

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20 Goodwin, D., and Boulton, A. 2024. *Co-designing Health Research in Aotearoa New Zealand: Lessons from the Healthier Lives National Science Challenge* | *Te hoahoa tahi i te rangahau hauora i Aotearoa: He akoranga mai i He Oranga Hauora te Wero Pūtaiao ā-Motu. Healthier Lives—He Oranga Hauora National Science Challenge.*

outcomes (such as increased health literacy, improvements in health-related behaviour or a greater sense of cultural safety) and monitor the direction of travel towards the ultimate goal: equitable health outcomes and greater health and wellbeing for all. Appropriate evaluation can give confidence that the desired changes will happen if the intermediate steps are taken.

Research undertaken through Healthier Lives has shown Māori and Pacific communities can initiate and lead research. Central government is not the only provider of wellbeing policy for Māori and Pacific communities: iwi, hapū and local government can all play a part.

In future, community-led research partnerships will increasingly develop new modes of community delivery in which Māori and Pasifika peak bodies (umbrella organisations with a broad remit and enduring presence) will partner with researchers and central and local government to deliver health initiatives that meet the needs and aspirations of communities. This is starting to happen already.

## Conclusion

Healthier Lives' research has showcased the potential of co-design approaches to create health services that meet the needs and aspirations of groups within our population who, to date, have not been well served by the health system.

The co-design reports and conceptual poutama offer an evidence-based guide for co-designing research with Māori and Pacific communities in Aotearoa New Zealand, and a benchmark for assessing the integrity of future co-designed research projects.

The Healthier Lives Implementation Network needs ongoing funding so that it can continue to support community-based providers to co-design, adapt and implement evidence-informed solutions.

Evidence generated by the Healthier Lives–He Oranga Hauora National Science Challenge has informed the national action plan for type 2 diabetes (under development at the time of writing). A wealth of Healthier Lives' research findings is also available to inform Health New Zealand Te Whatu Ora as it establishes new services and clinical networks for other major NCDs.



## Precision medicine



### Treating individual rather than average patients

Precision medicine takes account of individual differences in a person's genes, environment and lifestyle, encompassing vast human variation; in the genomic era it has come into its own.

Until recently, all patients were treated using a 'one size fits all' approach based on what was known to work for the 'average' patient in clinical trials, usually conducted overseas. Now, treatments can be targeted to the individual, resulting in better health outcomes, better use of limited health resources, and potentially reducing inequities. Along with the availability of new healthcare technologies, the application of molecular-level information from individual patients has made it possible to harness the power of precision medicine as never before.

Although precision medicine holds great promise and has been used for more than a decade in countries such as the USA, UK, Singapore and Australia, there are few examples of it having entered routine disease management pathways in Aotearoa New Zealand. In 2015, Healthier Lives saw opportunities to contribute to the integration of precision medicine in this country by:

- searching for and validating new cardio-metabolic risk predictors that could be incorporated into the existing cardiovascular risk assessment undertaken by GPs across the country to identify patients at greatest need of potentially life-saving interventions; and
- creating, testing and supporting the roll-out of simple, cost-effective, genomic diagnostic tests for cancer surveillance that could be deployed in any location, including rural areas and marae clinics, to track the progression of a patient's cancer and guide their treatment.

Healthier Lives research teams set out to create new evidence and tools with the goal of embedding these into healthcare pathways. This required researchers to work alongside the 'next-users' of these tools, such as the Ministry of Health, diagnostic pathology services, community health providers, GPs, oncologists and cardiologists.

### Cardiovascular disease research

Cardiovascular disease (CVD) is a significant cause of death and serious illness among middle-aged and elderly New Zealanders. It is the cause of almost one in three deaths, and around 170,000 New Zealanders live with the disease.

Many heart attacks and strokes (the most common forms of CVD) can be prevented by lifestyle factors such as not smoking, following a healthy diet and engaging in regular physical activity. Along with medications, these can reduce key risk factors for CVD such as raised blood pressure, raised cholesterol and the development of diabetes. Lifestyle changes and medication can also reduce the risk of further heart attacks and strokes in those who have already developed CVD.

Risk prediction is a vital tool that allows GPs to identify those patients at greatest risk of suffering a heart attack, stroke or other cardiac event, and enables them to recommend treatment options ranging from lifestyle advice to intensive and sometimes costly drug treatment. Lifestyle changes alone may not be sufficient to control risk factors, so it is fortunate that there are effective treatments available to reduce both blood pressure and cholesterol, and to get diabetes under control. The right treatment can significantly reduce a person's risk of having a first heart attack or stroke, and can help prevent further events in those who have already developed CVD. Preventing cardiac events by targeting interventions to those at highest risk not only reduces loss of life but also results in healthcare savings.



## Changing rates of CVD

CVD deaths increased steadily in Aotearoa New Zealand during the last century. While some of this increase may be explained by improved diagnostic methods that led to more reported cases and deaths, there is no doubt that the frequency of heart attacks and strokes increased.

From the late 1960s, as campaigns to quit smoking and eat less saturated fat led many people to make lifestyle changes, CVD rates began to decline. Although some of this decline can be attributed to the introduction of more effective drugs, such as statins to treat elevated blood pressure and cholesterol, noticeable reductions in the rates of CVD prior to the introduction of statins confirm the importance of lifestyle changes.

Since 2015 this decline has slowed and may have plateaued in some age groups. Hospitalisation rates for coronary heart disease appear to be increasing, and CVD rates in Aotearoa New Zealand are higher overall than in comparable countries such as Australia and the United Kingdom. Inequitable CVD outcomes (both death and disease rates) for some groups within the population persist: Māori, Pacific Peoples and those of Indian descent have CVD rates approximately three times higher than European and other New Zealanders.

Continued research efforts are necessary to reduce the impact of this major cause of premature death and ill health.

## Major contributions to cardiovascular disease research in New Zealand

Aotearoa New Zealand has a history of internationally recognised CVD research.

In the 1940s Sir Horace Smirk of the University of Otago pioneered work on the use of ganglion-blocking drugs in the treatment of hypertension, and established the benefits of treating raised blood pressure. In the 1950s Professor Olaf Simpson, also from Otago, continued research in this field and provided evidence to underpin some of the therapeutic regimes in use then and subsequently. In the 1960s Professor John Hunter from the same university published one of the early case control studies in which he demonstrated the importance of cholesterol as a risk factor for myocardial infarction.

More recently, researchers at the Christchurch Heart Institute have demonstrated the potential of brain natriuretic peptide (BNP) to diagnose heart failure, a discovery that has revolutionised the management of this condition worldwide. Auckland research led by Professors Norman Sharpe and Rob Doughty helped to clarify the role of beta blockers in treating heart failure; and Professor Harvey White was the first to demonstrate that thrombolytic therapy improved left ventricular functioning.

Of equal importance is the ground-breaking New Zealand research, led by Professor Rod Jackson at the University of Auckland, to improve the prediction of CVD risk for individuals.



## Relative vs absolute risk

Until the 1990s, CVD risk was assessed as the *relative* risk to an individual and associated with a particular attribute. For example, the CVD risk of someone who smoked 20 cigarettes a day was compared with the risk of a non-smoker. In clinical practice, relative risk was considered separately for each risk attribute identified in an individual (such as smoking, diabetes, hypertension and cholesterol). This method provided no indication of the likelihood that an individual would experience a CVD event within a specified timeframe.

Research supported by Heart Foundation NZ and led by Professor Rod Jackson at the University of Auckland made the first attempt to estimate *absolute* risk based on the presence and level of several major risk factors. This provides the patient and their doctor with an overall individual risk assessment that indicates the likelihood of a major CVD event within the next five years. This assessment is extremely useful in deciding whether a patient needs medication in addition to lifestyle management. Initially promoted by Heart Foundation NZ and then adopted into national clinical practice, this approach has now been adopted globally.

## Approaches to risk management

The initial CVD risk prediction equations used to calculate the relative risk of CVD events were formulated using data from the Framingham Heart Study. This USA-based study began in 1948 when CVD rates were more than double what they are today.

Participants in the Framingham study were less socioeconomically and ethnically diverse than today's population in Aotearoa New Zealand. Until recently, when estimating absolute risk in New Zealand, an arbitrary 5% was added for high-risk ethnic groups. For example, an estimated 20% risk of a CVD event occurring within five years would be increased to 25% for a Māori patient.

In 2002, a computerised decision-support system was created to help New Zealand GPs implement national guidelines for reducing CVD risk based on the assessment of absolute CVD risk over five years. This system enabled the establishment of a new study involving all those who had had a risk assessment. Through follow-up of this cohort, it has been possible to investigate whether the risk factors identified in the Framingham study are applicable to an ethnically and socioeconomically diverse New Zealand population in the twenty-first century. It has also been possible to examine the extent to which more recently identified CVD risk factors influenced the accuracy of prediction.

## Equitable CVD risk prediction

Healthier Lives concentrated its research efforts on equitable CVD risk prediction and funded three projects. The first project was built on existing clinical practice and therefore began significantly further along a pathway to implementation than the other two; it has already been implemented into national guidelines and practice. The other two projects are gathering the scientific evidence needed to generate tools for clinical practice, and require input from communities and clinicians before they can be translated to the clinic. Taken together, the three projects are highly complementary; each improves our understanding of the differences in the way CVD manifests across ethnic groups, and how patients respond to therapy.





## Equitable cardiovascular and diabetes risk prediction

This study enabled the derivation and validation of new equations for CVD risk prediction, which now include measures of deprivation, ethnicity and other predictors of increased or decreased risk. The study was funded by Healthier Lives along with the Health Research Council of New Zealand (HRC) and Heart Foundation NZ.

The new equations were derived using clinical data from the PREDICT cohort, a group of over 400,000 people aged between 30 and 74 years at the time of their first PREDICT risk assessment. The average follow-up period for those in the study was 4.2 years; a third of participants were followed for five years or more.

### Key findings

The overall five-year risk of total CVD events predicted by the new equations was 2.3% in women and 3.2% in men. This is significantly lower (by about 60% in women and 40% in men) than it would have been using the equations derived from the Framingham study.

The findings also demonstrated the striking effect of socioeconomic factors and ethnicity: Māori, Pasifika and Indian patients had a 13–48% higher risk of CVD than European patients, while Chinese and other Asian patients had a 25–33% lower risk of CVD than Europeans. Factors that had not been included in the equations based on the Framingham study were also found to be important predictors of risk – the presence of atrial fibrillation was associated with increased risk, and the use of lipid-lowering, anti-thrombotic and other cardio-protective drugs was associated with lower risk.

These results are of considerable clinical relevance. Given the previous overestimation of risk for some groups, many people are likely to have been overtreated with expensive medications, some of which are associated with side effects. The underestimation of risk for those of Māori, Pasifika and Indian ethnicities and those who experience socioeconomic deprivation may have resulted in cardioprotective drugs not being prescribed for these groups. This may be partly responsible for an increase in the well-documented inequities associated with CVD health outcomes.

### Implementation

In 2018 the results of Professor Jackson's research were published in *The Lancet*, one of the world's top medical journals.<sup>1</sup> In February 2018 the Ministry of Health issued a *CVD Consensus Statement and New Zealand Guidelines for CVD Risk Assessment and Management for Primary Care*,<sup>2</sup> which adopted the new risk equations for use in Aotearoa New Zealand. These updated the previous guidance in the 2012 New Zealand Primary Care Handbook. To integrate the new equations into practice, the Ministry also issued a new data standard.<sup>3</sup>

The equations have subsequently been integrated into MedTech, the medical records system used by New Zealand GPs, and sold to Australia, Singapore and Canada. Although GPs across the country can already use the new risk prediction equations, full implementation requires access to

1 Pylypchuk, R., Wells, S., Kerr, A., Poppe, K., et al. 2018. Cardiovascular disease risk prediction equations in 400 000 primary care patients in New Zealand: a derivation and validation study. *Lancet*, 391(10133), 1897–1907. [https://doi.org/10.1016/s0140-6736\(18\)30664-0](https://doi.org/10.1016/s0140-6736(18)30664-0)

2 Ministry of Health. 2018. Cardiovascular Disease Risk Assessment and Management for Primary Care. Wellington: Ministry of Health. <https://www.health.govt.nz/publication/cardiovascular-disease-risk-assessment-and-management-primary-care>

3 HISO 10071:2019 Cardiovascular Disease Risk Assessment Data Standard supports the frontline implementation of two new sex-specific CVD risk equations for primary prevention; for the general population and for patients who have diabetes. <https://www.health.govt.nz/publication/hiso-100712019-cardiovascular-disease-risk-assessment-data-standard>

an electronic risk calculator that is linked to up-to-date management guidelines and integrated with a GP's patient management system. Access to such software enables GPs to target advice regarding diet, physical activity and medications, rapidly and effectively, to those most likely to benefit. Two major primary care organisations (PHOs) – the National Hauora Coalition (NHC) and ProCare Health – have created systems to do just this. Together, these PHOs provide coverage to more than 1.2 million patients. The NHC has also made its system available to other PHOs.

### **Kaupapa partner perspective**

Porirua GP and clinical director of Ora Toa PHO Dr Sean Hanna says it is 'incredibly useful' to have electronic calculators that determine risk based on New Zealand data gathered from people of different ethnicities:

*In the past, the only option was to show people where they fitted into the multi-coloured charts from which cardiovascular risk was derived. Then, often to the embarrassment of the doctor or nurse, it was necessary to explain to Māori and Pacific patients and those of Indian descent that their five-year risk of CVD had to be arbitrarily raised by 5% to a higher risk category because of their ethnicity, a conversation often associated with a sense of shame for the patient.*

*The new equations enable each patient to have accurate, individual risk assessment and advice regarding appropriate management without this barrier to further discussion.*

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### **CVD risk for people with diabetes**

People living with diabetes are known to be at high risk of CVD. Factors that increase CVD risk in the population at large are also clinically relevant for people with diabetes, but the relative importance of each factor in this setting had not been established clearly. Professor Jackson's research team undertook preliminary work to test whether the new CVD risk equations accurately predict CVD in people with diabetes. The team found room for improvement.

The high level of screening for diabetes in Aotearoa New Zealand (approximately 90% of eligible adults had been screened by 2016) enabled researchers to develop a new set of diabetes-specific CVD equations. These perform significantly better than the new generic equations at predicting CVD risk for people with diabetes.

This research was published in *The Lancet* in 2021, and the diabetes-specific CVD equations are available for use in primary care.<sup>4</sup> GPs can now identify CVD risk more accurately for patients with raised levels of HbA1c. The research also showed that patients with an increase in HbA1c that is *below* the threshold for diagnosing diabetes are still at increased risk of CVD in the next five years. The new diabetes-specific CVD equations were widely implemented in software platforms available to GPs.

This research generated further information to assist in health-care planning. The research team was able to provide PHARMAC with an estimate of the proportion of the population that would meet the criteria for the proposed new SGLT-2 inhibitor drugs, which have a striking cardio-protective effect in people with diabetes. In 2021 PHARMAC used these data to plan access to the new pharmaceuticals that are now available.

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4 Pylypchuk, R., Wells, S., Kerr, A., Poppe, K. et al. 2021. Cardiovascular risk prediction in type 2 diabetes before and after widespread screening: a derivation and validation study. *Lancet*, 397(10291), 2264–2274. [https://doi.org/10.1016/s0140-6736\(21\)00572-9](https://doi.org/10.1016/s0140-6736(21)00572-9)



## Multi-Ethnic New Zealand Study of Acute Coronary Syndromes

The Multi-Ethnic New Zealand Study of Acute Coronary Syndromes (MENZACS) was established to assess ethnic variation in the clinical expression of coronary artery disease and to identify risk markers for subsequent events. The study, funded by the HRC, Heart Foundation NZ and Healthier Lives, recruited 2,200 patients admitted to hospital with a first heart attack, and achieved better representation of Māori and Pasifika patients than any previous heart study.

When patients are hospitalised following a first heart attack or other coronary disease event, certain factors may be protective against future events while other factors may put them at risk of an event recurring. Management of these risk factors in the community is known to decline markedly in the 12 months after a person has left hospital. Greater understanding of them could enable those at highest risk to be monitored and treated more intensively.

Some risk factors may be associated with ethnicity, but this is not yet well understood. At present, treatments for coronary artery disease are based on what works best for the general population. In future, however, it may be possible to offer treatments that work better for specific ethnic groups (and eventually for individuals within those groups).

The MENZACS study is focused on identifying a range of possible markers (protein, genetic and epigenetic) that will aid the development of an advanced precision medicine risk model. It collects information about study participants' lifestyle (diet, physical activity and smoking) and links this data to the Ministry of Health's demographic and treatment data. It also collects echocardiography imaging, blood and DNA samples. These data will be invaluable for answering ongoing questions about coronary artery disease in New Zealand.

The first analysis of MENZACS data has already begun to unpick some of the factors that confer differences in coronary disease risk for Māori and Pasifika. A model identifying the clinical factors that contribute to Māori and Pasifika having a second coronary event has been produced, and researchers are now delving into the clinical factors not currently recognised in standard diagnosis and treatment systems, in order to find better ways of treating people from different ethnic groups.

## Using epigenetics as a precision medicine tool in equitable prediction of cardiovascular disease outcomes

Aotearoa New Zealand has made great strides with CVD risk prediction using clinical and metabolic data in addition to information relating to sex and ethnicity. However, there is still room for improvement in the sensitivity and specificity of risk prediction. For example, although smoking has long been recognised as a leading risk factor for a wide range of chronic conditions, including CVD and cancers, the limitations and inaccuracies of self-reported data about smoking are well recognised.

Epigenetics is a new and growing area of disease prediction. It looks at modifications to DNA that occur due to environmental factors such as smoking, nutrition, physical activity and stress. Throughout their life, each individual's interaction with the environment leaves imprints on their DNA without changing the underlying genetic code. These reversible changes reflect each person's unique past environmental history.

DNA methylation (DNAm), a form of epigenetic modification, is emerging as a precision medicine biomarker that can surpass the performance of conventional risk prediction markers. Certain highly specific DNAm patterns have been associated with cardiovascular disease. A simple blood test can identify these precise and nuanced markers in each individual.

This study, led by Professor Greg Jones (University of Otago) and Dr Anna Rolleston (The Centre for Health), aimed to identify novel epigenetic markers as precision medicine tools to improve the prediction of future CVD events in Aotearoa New Zealand's ethnically diverse population of patients with coronary heart disease. It examined DNAm in samples collected from a subset of 1,100 participants in the MENZACS study, carefully selected and matched by age and sex across four ethnic sub-groups (Māori, Pasifika, Indian and European).

The MENZACS Māori Governance Group and a member of the Genomics Aotearoa Vision Mātauranga team had active oversight and direct involvement in the design of the study and the analysis of data. The research group purposefully adopted this co-design and co-analysis approach to avoid a 'deficit lens' perspective in the interpretation of data.

Over 850,000 distinct DNAm markers in each sample were analysed for their relationships with CVD risk factors and five-year outcomes. For each of these comparisons, a sub-analysis was conducted to determine if the observed effects were consistent across ethnicities. These quality control studies confirmed that the data derived from samples accurately replicated observations made in previous international epigenetic studies, giving strong confidence of a well-functioning dataset.

### **Key findings**

The study identified many DNAm markers, some of which were selected for potential clinical translation. Of these, a DNAm marker called cg05575921 (located within the gene *AHRR* which helps process toxins) showed a consistently strong association with self-reported smoking status, and accurately predicted lifetime tobacco consumption, length of smoking cessation in ex-smokers and passive smoking exposure.

Unlike self-reported smoking status (currently used in clinical risk prediction tools), this marker can differentiate risk among ex-smokers (depending on when they stopped smoking) and those who have never smoked, identifying risk for people with significant exposure to passive smoking. When the team subsequently examined the presence of this marker in the entire MENZACS cohort of 2,000 patients, it was also associated with CVD outcomes within the next five years, and this observation was independently validated in the Otago Coronary Artery Disease outcome study.

The research team therefore developed a blood test to identify the marker in clinical settings. This simple and affordable test has potential to improve CVD risk prediction by removing reliance on a patient's recall and accurately assessing life-time smoking exposure for people whose risk may previously have been underestimated, such as those with extensive passive smoking exposure. This level of precision will enable patients at higher risk to have intensive management, and will free others from unnecessary worry.



## Cancer research

Cancer is a major non-communicable disease that accounts for a significant proportion of death and ill health in Aotearoa New Zealand. Every year approximately 25,000 New Zealanders are diagnosed with cancer and 9,000 die from it. Lung and colorectal cancer account for the highest number of cancer deaths in Aotearoa each year. While cancer survival rates have improved over the past 20 years, they are not improving as quickly in Aotearoa New Zealand as in other high-income countries, and there are ongoing and unacceptable inequities: Māori are 1.6 times more likely to die from cancer than non-Māori.<sup>5</sup>

Because cancer surveillance and treatment services are based in major hospitals, people who live in rural areas and those on low incomes find it more difficult than others to access these services. With little or no representation of Māori and Pacific Peoples in international drug trials, treatment strategies have in-built biases that favour the largest population groups. Aotearoa New Zealand has been slow to integrate genomic technologies into clinical practice, and this has delayed the uptake of personalised treatment and exacerbated health inequities that favour New Zealanders of European descent.

The goals for using precision medicine to improve cancer treatment include identifying a patient's dominant tumour mutations, determining their drug sensitivities and rapidly assessing their response to treatment. Healthier Lives chose to research the use of circulating tumour DNA (ctDNA), a disruptive technology at the vanguard of precision medicine, as a way of accelerating the integration of personalised cancer care into standard practice in Aotearoa New Zealand and reducing the inequities inherent in 'one size fits all' treatment.

CtDNA technology uses a simple and relatively inexpensive blood test to detect DNA that has been released from a tumour into the bloodstream; it provides a rapid and very accurate measure of a patient's tumour burden that can enable more nimble treatment.

There are numerous potential applications for ctDNA in the day-to-day care of cancer patients: initial diagnosis; confirming uncertain scan findings; identifying drug targets when a biopsy of a tumour is not possible; monitoring response to treatment so that futile treatments can be stopped and promising new treatments can be rapidly assessed; designing maintenance therapies to provide the best quality of life for patients whose condition is terminal; monitoring the evolution of tumours so that drug treatments can be changed accordingly; and assessing the likely prognosis. It could also potentially allow patients who are concerned about their health to take more control by proactively seeking information to confirm or exclude a cancer diagnosis.

As a tool for early cancer diagnosis and the follow-up of patients during and after treatment, ctDNA has the potential to increase community-based cancer management, reducing pressure on hospital radiology departments and improving access to healthcare for rural, Māori and Pasifika populations. Whereas the high-cost imaging technology (e.g. MRI) that is the current mainstay of cancer detection is only available at major hospitals, blood samples for ctDNA testing can be taken in isolated locations such as clinics in rural marae or Pacific Island communities. The simplicity and accessibility of blood tests could reduce travelling time and costs for patients, reduce costs to the health system, and result in more effective patient care.

Another example of the dual benefits of ctDNA to patient care and the health budget is its application to monitoring a patient's response to treatment. Expensive and toxic treatments that are not working can be stopped at an early stage and alternative treatments swapped in more rapidly.

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5 Health New Zealand Te Whatu Ora. 2024. Mortality Web Tool. Retrieved June 29, 2024, from <https://tewhatuora.shinyapps.io/mortality-web-tool/>

Healthier Lives focused its research programme on refining ctDNA technology, improving the sensitivity of the test and developing it for routine use in diagnostic laboratories, with a view to integrating it into clinical care in Aotearoa New Zealand. Two consecutive projects – effectively a nine-year research programme – were funded and led by Professor Parry Guilford (University of Otago), Professor Cristin Print and Dr Cherie Blenkiron (both University of Auckland).

### Major contributions to cancer research in New Zealand

Cancer research in New Zealand dates back to the early days of radio-oncology at the turn of the last century. In 1908, in what was perhaps New Zealand's earliest and arguably most successful n=1 oncology experiment, W.H. Hosking of Masterton cured a lip epithelioma using radium. The first laboratory-based cancer researcher, Andrew Begg, was appointed to the Cancer Research Laboratories in Dunedin in 1930, where he studied the role of connective tissue in tumorigenesis, an enduring topic that forms part of the larger field currently known as 'tumour-microenvironment interactions'. Beginning in the late 1940s, Marianne Bielschowsky began working in the Department of Pathology at the University of Otago. There she bred the New Zealand Black Mouse, a foundational mouse model for global cancer research. In the 1960s, Bruce Cain of Auckland's Cancer Research Laboratory was a pioneer in the field of medicinal chemistry, highlighted by the successful development of the DNA-binding drug amsacrine for the treatment of acute leukaemia.

In 1992, in an early foray into personalised cancer therapy, Bruce Baguley from the same laboratory began exploring the use of cultured melanoma cells as avatars for an individual patient's cancer drug sensitivity testing. In adjacent labs, Bill Wilson, Bill Denny and colleagues initiated studies that launched the field of hypoxia-activated prodrugs – a class of drugs that are inactive until they reach the tumour. Around the same time, Tony Reeve, in the Cancer Genetics Laboratory at Otago, pioneered discoveries that showed the importance of epigenetic markers to the development of childhood tumours; and soon after, Parry Guilford from the same laboratory, in collaboration with the McLeod whānau of Mt Maunganui, identified the first known gene for inherited stomach cancer, for which they were awarded the 2023 Prime Minister's Science Prize.

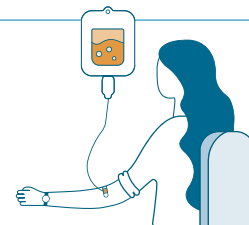
New Zealand researchers, both resident and those working in overseas groups, continue to excel in the fields of epigenetics, drug development, cancer genetics, precision medicine and cancer epidemiology.



Researchers from Healthier Lives precision medicine theme: Sandra Fitzgerald, Parry Guilford, Jordon Lima, Cristin Print, Anna Rolleston, Greg Jones.



## CtDNA for better cancer management: The application of precision oncology to the New Zealand healthcare system



Initial research developed the complex molecular techniques needed to get ctDNA research underway in Aotearoa New Zealand. It was centred on the treatment response of three cancers: colorectal cancer, melanoma and breast cancer. Colorectal and breast cancer were chosen because of their high incidence in Aotearoa New Zealand; melanoma was selected as an exemplar of an aggressive cancer that is responsive to targeted treatments and immunotherapies. Melanoma has the highest excess mortality in Māori compared to non-Māori of any cancer, in part due to the common perception that it is confined to Pākehā.

A similar study design was used for each of the three cancers. Study participants with advanced cancer were recruited and researchers obtained tumour samples at the start of their treatment to identify mutations that could be used as personalised markers of disease burden. The research followed participants throughout their treatment (which was monitored using standard radiological and clinical assessments) and took blood samples before each round of therapy so that ctDNA results could be compared with those from the standard assessments.

### Key findings

The research found that the ctDNA diagnostic test is a sensitive and rapid tool for monitoring cancer patients' response to treatment; it offers information in close-to-real-time that can help clinicians, patients and their families understand the trajectory of the patient's disease.

Around 97% of colorectal cancer patients with metastatic disease had detectable ctDNA, and, in comparison to current standard assessments, ctDNA faithfully portrayed the changing tumour burden through the course of treatment. By comparison, only 77% of colorectal cancers in the study could be tracked with a blood test called carcinoembryonic antigen (CEA) – the current standard test. Moreover, CEA's responses were often delayed compared to ctDNA.

Around 80% of melanoma patients undergoing immunotherapy treatment had detectable ctDNA that provided an accurate measure of response to treatment. This melanoma study strongly supported the use of ctDNA as a tool that could enable an expensive but ineffective treatment to be stopped, allowing patients to try other treatments before clinical deterioration and saving the healthcare system unnecessary cost. Finally, a longitudinal study on ctDNA in breast cancer patients undergoing chemotherapy showed ctDNA detection rates of greater than 80%, which was higher than expected in this cancer.

To determine whether ctDNA technology is pragmatic, researchers established that ctDNA measurements can be turned around in three days, an interval rapid enough for clinical use. They also demonstrated that blood samples could be stabilised for seven to ten days, providing sufficient time for sampling in remote locations and transport to centralised testing laboratories.

To accelerate implementation of the technology, the research team obtained aligned funding to develop a prototype indwelling device to capture ctDNA *in vivo*. This is needed in situations where smaller blood draws are preferable, such as surveillance of children and early diagnosis. The ribbon-like device is fed through a cannula into a blood vessel and left for ten to 30 minutes to maximise DNA capture.



## Integration of ctDNA into the New Zealand healthcare system

A second phase of ctDNA research was focused on finding ways to support its integration into clinical practice within the New Zealand healthcare system.

A bioinformatics pipeline for streamlining the analysis of biological data is essential for this purpose, so in partnership with the collaborative research platform Genomics Aotearoa, the research team built a prototype pipeline.

Team members also looked for new applications of ctDNA where the technology would not disrupt follow-on clinical practice and would therefore be easier to introduce. Supported by aligned funding and new collaborators, the research expanded to encompass different types of cancer and diverse clinical scenarios. Lung cancer stood out as a cancer where ctDNA could make a significant difference.

Targeted therapies are now available for lung cancer. These highly effective treatments can offer patients a better quality of life than chemotherapy, but before patients can receive them a biopsy is needed to determine the specific tumour mutation. However, some people are not well enough either to undergo a lung biopsy or to receive standard chemotherapy. The research team wanted to find out whether ctDNA could detect specific mutations and allow targeted therapy to be prescribed to this group of patients.

The HRC-funded FAST study, led by Dr Annie Wong (University of Otago), is investigating this question. The study is collecting blood samples from patients and sending them overseas for full genomic analysis, an expensive process that cannot currently be undertaken in Aotearoa New Zealand. Meanwhile, researchers are working on the development of an affordable, homegrown solution through clinical validation of a ctDNA test that would be sufficiently specific to allow patients to access targeted therapies for lung cancer.

A previous limitation of the ctDNA diagnostic test was that it could be hard to detect mutations when little tumour material was available, for example in the early stages of disease. However, cancer leads to global changes in the methylation of cancer tissue that acts almost like a fingerprint to differentiate cancerous from normal tissue. Researchers hope to combine mutation and methylation markers to produce a ctDNA test with a far higher level of sensitivity than at present. Their aim is to produce a standalone test for the early diagnosis of lung and colorectal cancer in people who have symptoms, high risk factors or a family history (but are not eligible for current screening). Such a test could be used close to where people live (in rural clinics for example), and could potentially become an adjunct to the existing bowel cancer and proposed lung cancer screening programmes.

### Impact of Covid-19

The Covid-19 crisis caused significant disruption to this research programme from the start of Aotearoa's national lockdown in March 2020. The ability of cancer clinicians to collaborate in clinical trials was severely restricted. During the height of the national Covid-19 testing effort, laboratory facilities were taken over and research staff were seconded to contribute to testing. Patient recruitment was not possible during the lockdowns and was difficult for several months afterwards because many clinic appointments were conducted via tele-medicine, and biobanking (to consent the patients and collect the samples) could not re-start immediately.



It took time for clinical and laboratory staff to recover from the impacts of Covid-19, and it was not until April 2021 that laboratory systems were fully operational again. Plans to build collaborations with two Māori communities in remote parts of the country were hindered by travel restrictions and the need for health providers in those communities to prioritise the vaccine roll-out. One of these collaborations went ahead but at a slower pace than planned.

While the progress of the research was affected by these factors, there were some silver linings in the form of increased public awareness of genomics and the skills gained by staff taken away from research to do Covid-19 testing.

Perhaps the greatest unexpected benefit, however, came from the pressure on the research team to think outside the box to keep research going during this difficult period. Unable to make progress with clinical trials, researchers whose labs remained open were able to re-focus on the 'basic science' underpinning ctDNA technology. They investigated the use of an alternative DNA sequencing technology (Nanopore) for remote ctDNA testing. Nanopore infrastructure is cheap (around \$5,000 for a basic device and computer) and transportable (the hand-held device is smaller than a cell phone). Its portability helps with education and mitigates concerns around data ownership. Enabling the use of this technology will be an important step in taking ctDNA-detected cancer diagnosis to remote regions.

## New ways of doing research

While the potential clinical applications of the research are novel and exciting, the way it is being conducted is also novel and is creating a paradigm shift in biomedical research. Two examples show how being part of an active research community within a co-governance model that focuses on equity, collaboration and improving health outcomes is changing the way research is being done.

### Epigenetics

When the Healthier Lives Governance Group and Kāhui Māori first considered funding the epigenetics study, it discussed concerns that applying a deficit lens to epigenetics could be used by some doctors to blame or stigmatise patients for their lifestyles. Epigenetic markers may be able to identify the environmental exposures of parents and grandparents, which could lead to difficult conversations within some families. Epigenetics may also shed light on the intergenerational effects of poverty and colonisation. When the decision was taken to fund this study, these concerns were conveyed to the research team. The team was charged with taking great care to avoid misuse of its findings.

The project was undertaken with governance oversight from the MENZACS Māori Governance Group, which provided guardianship of the data collected and ensured that the study adhered to the principles of Te Mata Ira Cultural Guidelines for Biobanking and Genomic Research.

The research team, which included Māori, Pasifika and Pākehā researchers, went a step further and established an epigenetics analysis group with strong Māori representation. This group agreed upon a kaupapa Māori framework and a set of core values for data analysis within the study. It met prior to each statistical testing phase to pre-approve statistical questions and ensure that a deficit lens was not applied to either the research questions or the subsequent analysis and interpretation of data.

While some research groups have Indigenous governance oversight, this may well have been the first biomedical research group anywhere in the world to apply Indigenous oversight to the analysis of data. During the first few rounds of data analysis, no ethnicity data was considered. The decision to begin probing ethnicity data was only made once trust had been established within the group.

This way of working undoubtedly slowed analysis, but Healthier Lives researcher Professor Greg Jones described it as ‘a wonderful journey’. He noted that in the past, biomedical researchers could take their eye off the ball regarding how their research would be used. The Healthier Lives focus on equity meant that Indigenous oversight became a core principle of this study and ‘every decision was put through an equity litmus test’:

*When we realised that we needed to look at the ethnicity data, we saw replication of Eurocentric scores but we asked whether these are appropriate for Māori and Pasifika.*

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The approach is being picked up elsewhere. The MENZACS management group is already mapping the processes for Indigenous oversight of data analysis into other areas of the larger MENZACS study.

**Cancer**

The ctDNA research leaders also noticed changes in their approach to science, which they attributed to Healthier Lives’ focus on achieving equitable outcomes. One such change was the creation of an active cancer research community, extending from technicians in the lab to patient groups and Iwi health groups:

*We never had that before we started our Healthier Lives project. We had small patches of connection but we didn’t have that end-to-end connection. This was my first truly end-to-end project. It built something that will endure and won’t go away. We had meetings where we sat in the same room with Māori nurse navigators, Iwi representatives, Pacific nurses, patient group representatives, me, an oncologist, a clinical lab scientist. That was unique and really powerful.*

**Professor Cristin Print**  
The University of Auckland

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Professor Print believes these connections will make a huge difference to ‘the nuts and bolts of getting something implemented in Aotearoa New Zealand’, because clinicians and patient groups are now convinced that ctDNA technology is viable and beneficial to them.

In the past, biomedical scientists may have been unsure about the value of community engagement. But Professor Guilford considers it to be ‘absolutely critical’ in creating demand for precision medicine from communities, which in turn generates ‘the enthusiasm, energy, direction and focus of the researchers’. He also thinks it can help researchers grapple with difficult questions about how and when their results should be used:

*You can see the guidance from communities that helps us with really difficult and important decisions that we struggle with all the time: when is our technology good enough to roll out? Rather than us making that decision, let’s ask the communities to tell us. Healthier Lives encouraged and enabled us to have this engagement [which] has helped answer some of these really important questions.*

**Professor Parry Guilford**  
University of Otago

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## Next steps



### CVD

The accuracy of CVD risk assessment for individual patients in Aotearoa New Zealand has been improved significantly thanks to world-leading New Zealand research led by Professor Jackson. Epigenetic research holds promise for further refining of risk prediction. If successful, this will be a step closer to genuine precision medicine: risk will be assessed for each individual based on an objective assessment of both environmental and genetic determinants of risk along with other biological measures.

Significant progress has been made in ensuring that GPs have access to the technology that makes CVD risk assessment easy to use, and the Ministry of Health has commissioned work on another system that has potential to enable consistency throughout the country.

However, the benefits of CVD risk assessment are only truly gained when an individual visits their GP, an assessment is undertaken, and appropriate treatments are prescribed for those at high risk. Close monitoring by GPs is also required to see whether the risk factors improve.

Māori and Pasifika patients are less likely to visit GPs than other sectors of the population, and evidence shows they encounter barriers in accessing treatments for heart disease (a sub-category of CVD) at every point along the healthcare continuum. Māori and Pasifika patients are less likely to receive risk assessment, less likely to receive treatment, more likely to present to a hospital with advanced heart disease, and more likely to die from heart disease than other New Zealanders.

Healthier Lives and Heart Foundation NZ therefore co-funded the Manawataki Fatu Fatu project (see above) to investigate the barriers in accessing healthcare that contribute to inequitable heart health outcomes for Māori and Pasifika and develop an equity roadmap towards removing them.

The Vascular Society of Aotearoa New Zealand, Heart Foundation NZ and the Australasian Cardiac Society have welcomed the new test for smoking exposure and suggested that a similar test for vaping exposure be developed.

Smoking is a key risk factor for other chronic conditions, so the test will be trialled as a possible pre-screening tool for both lung cancer and abdominal aortic aneurysm. Plans are also being developed for an Australasian collaboration to examine its use as a tool to predict which patients with peripheral artery disease are more likely to progress to the more serious critical limb ischaemia, which can result in sepsis or amputation.

This study identified many DNAm markers that could lead to improvements in healthcare, and research on these will continue for years to come. Another DNAm test (involving multiple markers) is currently being developed for the assessment of lifelong diabetes/metabolic syndrome effects. Given that rates of type 2 diabetes are predicted to rise steeply in Aotearoa New Zealand over the next 20 years, this test could have far-reaching benefits in enabling those at greatest risk of poor future health outcomes to be prioritised for early interventions.

### Cancer

CtDNA technology opens a wider window into the biology of an individual patient, allowing more informed decisions about their care. Economic data from overseas indicates that introducing ctDNA into clinical care will result in patients receiving the right treatment for them at no significant additional cost to the health system.

Healthier Lives supported ctDNA research in Aotearoa New Zealand for nine years, establishing tools and methods for its use. To maintain momentum as the Healthier Lives research ended, the research team supported other researchers to become involved in, and lead, ctDNA research.

Research into the potential application of ctDNA in the diagnosis and treatment of lung and bowel cancer (described above) is ongoing, and there are also plans to investigate other potential applications. For example, head and neck cancer requires radical surgery and has a high rate of relapse. Researchers want to investigate whether ctDNA can be obtained from post-surgical lymphatic fluid to identify residual disease and guide future treatment. Young women are being diagnosed with endometrial cancer in increasing numbers and many want to retain their fertility so prefer the option of hormone treatment to a full surgical hysterectomy. However, not everyone responds to hormone treatment and the test to predict this response is invasive. Researchers want to see whether they can develop a less invasive test using ctDNA.

The challenge of bringing ctDNA into clinical practice in Aotearoa New Zealand is ongoing; as the technology develops, stakeholders are becoming increasingly interested in using it and researchers are finding more applications for it. This will be an area of rising demand and expanding activity in coming years.

## Conclusion

In August 2023 the Ministry of Health published its first long-term insights briefing on precision medicine as a step towards the development of a cohesive national strategy. It identified precision medicine as an opportunity for different models of care to prevent illness and target treatments in the face of rising demand for healthcare services and unprecedented pressures on the healthcare system. To embed precision medicine as a service that can benefit New Zealanders, much work remains to be done within government on introducing the necessary legislation, governance, infrastructure, ethics, privacy and data sovereignty principles, as well as framing regulations to minimise the risk of genetic discrimination.

Meanwhile, researchers will continue to build on the work undertaken through Healthier Lives to develop multiple applications of precision medicine using epigenetic and genomic technologies that can equitably enhance healthcare in Aotearoa New Zealand over coming decades.

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## Afterword



Over nine years, Healthier Lives funded research to address some of the major health issues facing our country and we collaborated with like-minded organisations to initiate new research directions, develop co-design research methodologies, improve the pathways between research, policy and practice, and support the implementation of evidence-based health programmes.

Exceptional governance and leadership has played a major role in the success of Healthier Lives. The wise early decision to unite the Governance Group and Kahui Māori into a single governing body demonstrated the value of co-governance. The leadership of Dr Jenny McMahon and Sir Jerry Mateparae set an inspirational example of the collaborative approach needed to achieve our objectives. Advice from our International Science Advisory panel, chaired by Professor Shiriki Kumanyika, afforded an invaluable global perspective and helped to ensure that our research met high international standards.



Striving for health equity was a defining and transformative feature of our research programme. This was acknowledged by Professor Kumanyika when she visited Aotearoa in 2018 to review Healthier Lives research projects: 'Researchers around the world talk about equity but you are really trying to do something about it'. This focus on achieving equitable health outcomes changed the way research was conducted and will be an enduring legacy of Healthier Lives' approach.

Before the establishment of National Science Challenges a decade ago, mission-led research had not been funded on such a scale in Aotearoa New Zealand. The unwavering commitment of Healthier Lives research teams to the mission of equitably reducing the burden of non-communicable diseases led to a degree of collegiality amongst people (with divergent interests and backgrounds) that I have not previously witnessed in my long professional life. The contribution of community partners, health care providers and policymakers in determining research priorities and co-designing research was an equally important component of our mission-led approach.

I believe that Healthier Lives researchers and kaupapa partners can be proud of what they have achieved over the past ten years in developing and testing a wide range of interventions for clinical, community and public health contexts. Healthier Lives' vision of 'Aotearoa New Zealand with equitable health outcomes and a substantially reduced burden of non-communicable diseases' can become a reality if there is sufficient will to adequately resource these and other evidence-based programmes.

**Jim Mann**

Dunedin, June 2024

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Images right: Healthier Lives whānau, 2016-2024, including Members of the Governance Group and Kāhui Māori, ACTIVATION research team and International Science Advisory Panel.



## Appendix: Research Publications

### Publications from the Healthier Lives–He Oranga Hauora National Science Challenge

*Note: Further publications are expected after June 2024.*

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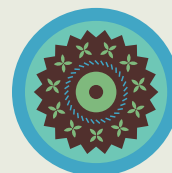




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