



**MASSEY**  
**UNIVERSITY**  
TE KUNENGA KI PUREHUROA

UNIVERSITY OF NEW ZEALAND

# **A 21ST CENTURY COLLEGE OF HEALTH** **TE KURA HAUORA TANGATA**

Transformative approaches to health and wellbeing

**2014** to **2020**

**PROFILE** AND  
**STRATEGIC PLAN**

THE ENGINE  
OF THE **NEW**  
NEW ZEALAND



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# A 21st century College of Health

**So what is the best approach to building health and wellbeing in the 21st century? How do we best allocate our energies to improving the 'healthspan' of New Zealanders?**



If you want to grow old, now is a good time to be born. Statistics New Zealand puts the average life expectancy of a New Zealand boy born between 2011 and 2013 at 79.7 years and that of a New Zealand girl at 83.2.

These are the highest life expectancies New Zealand has ever known, and viewed in an historical context, they are extraordinary tallies.

For my parents' generation, breaking 70 was 'a rich, full life'. Today, for better-off New Zealanders – a necessary distinction – 70 is almost a given and

to die in one's 60s is to have a life cut tragically short.

Between 1990 and 2010, average life expectancy soared by 5.4 years. These bonus years are the result of a rich mix of interacting factors. Immunisation, family planning, medical advances, restrictions

on the sale of alcohol and tobacco, better housing, cleaner air, safer food... the list is long.

But whether we continue to live yet longer, healthier lives as the 21st century advances towards its third decade, bringing fresh challenges (climate

change, drug resistance and many others), is much less certain, as is the quality of the time we are gaining. An 80-plus-year lifespan sounds far less attractive when you know that the current estimate is that the average New Zealander will spend 11 years with disability or disease.

So what is the best approach to building health and wellbeing in the 21st century? How do we best allocate our energies to improving the 'healthspan' of New Zealanders?

One useful guide is provided by the factors and weightings employed by the University of Wisconsin Population Health Institute to rank the health of America's communities.

First comes 'Social and Economic Factors' – education, employment, income, family and social support, and community safety – at 40 per cent, then 'Health Behaviours' (a title I dislike, for 'behaviours' implies personal choice when it is more productive to view things like tobacco use as the expression of the characteristics of the societies in which people live) – tobacco use, diet and exercise, alcohol and drug use, and sexual activity – at 30 per cent, then 'Clinical Care' (access to care and quality of care) at 20 per cent and finally 'Physical Environment' (air and water

**Professor Paul McDonald** took up his appointment as the Pro Vice Chancellor in 2013. Before joining Massey, Professor McDonald spent 15 years as the Director of the School of Public Health and Health Systems, Chair of the Department of Health Studies and Gerontology, and Director of the Population Health Research Group at the University of Waterloo in Canada. Professor McDonald's expertise in public health, population health intervention, and tobacco control has been called on by a wide array of governments, nonprofit and private sector organisations internationally. A Fellow of Britain's Royal Society for Public Health, Professor McDonald holds a PhD in health studies with a specialisation in population health, and an MA in clinical psychology.

## College of Health/Te Kura Hauora Tangata

### Mission

To enhance and protect human health, health equity and wellbeing through transformational ideas, people and partnerships.

### Vision

Aotearoa/New Zealand will be a global leader in enabling better health and wellbeing for all.

### Values

Integrity, excellence, equity, independence, upholding the principles of Te Tiriti o Waitangi/ the Treaty of Waitangi.

quality and housing and transit) at 10 per cent.

This multifactorial way of thinking is a useful corrective to the idea that public health is mainly about what goes on in doctors' surgeries and hospitals – although no-one would deny the need for surgeries and hospitals – and it shows just how cross-disciplinary the business of public health has become.

Given the opportunities for improving health in the 21st century, we should ask whether a 20th-century model of investment and training in medical care is the right approach.

Physiologists, nutritionists, epidemiologists, food technologists, exercise scientists, Māori and Pasifika health experts, nurses, social workers, public policy practitioners, psychologists, microbiologists, social scientists, town planners and transport experts: all will have their part to play.

This is why Massey's College of Health – the newest of Massey's colleges – is poised to make a positive difference. In its 50-year-plus existence, Massey has accumulated a critical mass of expertise in a range of health disciplines. With the arrival of the College of Health, we are purposefully marshalling those strengths and setting out to make a difference. I invite you to watch our progress – or better still, to work with us.



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# Massey University and the College of Health

From a small, elite agricultural college in Manawatū, Massey University has grown to become New Zealand's largest university, with campuses in the cities of Auckland, Wellington and Palmerston North. It also has more distance students than any other New Zealand university.

In 2014 Massey celebrated a number of anniversaries: 50 years as a university, 50 years since it introduced the world's first degree in food technology, and 21 years since it opened its campus in Albany, Auckland.

Massey offers the only veterinary science programmes in New Zealand and the only aviation degree. Its qualifications are recognised worldwide and several programmes have international accreditation. Massey is consistently ranked among the world's top 3 per cent of universities.

The university has approximately 30,000 students studying online or on campus. It also operates in Singapore, Brunei and Qatar. Recently the university launched Massey Worldwide, an initiative that is extending its global presence and global strategic partnerships.

Founded in 2013 and incorporating five schools, the College of Health builds on the world-class expertise that the university has built up during its history. The college hosts a number of major research centres and has approximately 3000 students and 300 academic and support staff, who work and study in fields that include nursing, nutrition, dietetics, public health, biomedicine, social work, disability and rehabilitation, sport, exercise and food technology. The college is developing new programmes and research expertise in healthy ageing, health promotion, health analytics, health evaluation, health system integration and design, and indigenous health.



ALBANY



MANAWATŪ



WELLINGTON



### College of Health enrolments 2013

Students enrolled in one or more College of Health papers	5382
Students	3000
PhD students	186
Staff	302

### Massey Performance-Based Research Funding programme ranking among New Zealand universities

Nursing	1
Health studies	2
Sport and exercise science	3

Research income 2013 **\$12 million**

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## 21st-century health challenges

The 20th century ushered in a long list of extraordinary advances in health: vaccinations, new medical products and procedures, road

### Climate change

While there are various scenarios for the speed with which global warming will advance this century, the fact that significant global warming is happening is undeniable. The incidence of severe weather events, both storms and droughts, is increasing, and these events and their aftermaths will affect public health. Rising temperatures will change the distribution of some diseases. Dengue fever and malaria, for example, travel with their temperature-sensitive mosquito hosts. The effect of climate change will even be seen in the prevalence of airborne pollution and allergens. In New Zealand's region, some low-lying countries, such as Kiribati, will become increasingly uninhabitable due to sea-level rise and salt-water contamination, leading to mass migration. Food production will be greatly affected by changing patterns of rainfall and drought.

By 2050 the **world's population** is projected to climb by

**38**  
per cent.

From 6.9 billion in 2010 to 9.6 billion in 2050. United Nations, Department of Social and Economic Affairs, *World Population Prospects: 2012 Revision*, June 2013

### Food production and distribution

The year-on-year dividends of the green revolution – the development and take-up of new fertilisers, fungicides, pesticides, plant varieties and farming practices that enabled the world to more than double its population between 1960 and 2012 (from three billion to seven billion) and to feed people better – are faltering. In the 1960s the growth in crop yields was around 3 per cent per year for staple crops. Today it sits at around 1 per cent – and many of our current-day practices are environmentally unsustainable.

Even now, according to the Food and Agriculture Organisation of the United Nations, nearly 900 million people, or one in every eight of Earth's inhabitants, are chronically undernourished. In 2050, in a more resource-constrained world, there will be two billion more mouths to feed – the equivalent of adding two extra Indias to the population. What is more, as the inhabitants of countries such as China increasingly join the city-dwelling middle classes, they will add to the demand for what we already have: a resource-hungry diet rich in meat, dairy and fats.

Food security – ensuring that all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life – is a pressing issue.

### Global urbanisation

At some point in 2008 the balance of where the world's population lived shifted from rural to urban, and globally that shift continues. In already-urban New Zealand the local effects will be modest, but elsewhere in the world – in India, China and Africa – the consequences will be huge. Urbanisation changes how people work, eat, sleep and play. It changes smoking, alcohol consumption, and sexual behaviour. It brings higher incomes and greater opportunities – but there are drawbacks too. Many of the factors associated with urbanisation increase the risk of chronic diseases and of some infectious diseases.

### Health disparities

When it comes to average life expectancy, New Zealand may sit towards the top of the international league tables, but statistically if you are a Māori or Pasifika New Zealander, or you are born into an area of socioeconomic deprivation, or you lack educational qualifications, you do not fare nearly so well. This problem is not going away: in the past three decades New Zealand has become a more unequal society.

In 2010 **inactivity-associated medical costs** in New Zealand amounted to

**\$1.3** billion

Market Economics Ltd, Wellington Regional Strategy, Waikato Regional Council and Auckland Council (2012). *The Costs of Physical Inactivity: Towards a Regional Full-Cost Accounting Perspective*.

safety, better occupational health, fluoridation, environmental protections, and the enormous agricultural advances that enabled the world to feed its expanding population, to name but a few. These advances continue incrementally to improve our lives. But the 21st century brings fresh challenges and demands both new solutions and new health professionals.

## Building social capital and a healthy society

Although the idea of individual agency – that people choose to smoke, drink to excess, eat poorly, or avoid physical activity – is attractive to those of a laissez-faire cast of mind, the weight of evidence is that we are very much the products of our social and physical environments.

An example: in a famous United States study it was found that if someone had a friend who had become obese, the likelihood that they too would become obese increased by 57 per cent; if it was a close friend, the likelihood tripled.

We need to build societies in which healthy behaviours – such as diet and exercise – are the easy default. We need to build social capital – the network of relationships that creates cohesive, caring communities and societies that foster health, wellbeing and prosperity.

We tend to think of such things as smoking or obesity as medical issues with social implications, when it is more productive to think of them as social challenges with medical implications.

How we act now will have enduring effects. Epigenetics – the study of changes in gene expression occurring in the absence of changes in DNA sequences – has shown that the patterns of diet, exercise, stress and environmental exposures we experience over our lifetimes affect both our health and that of our descendants.

## The rising cost of healthcare

We live in an age when medicine can perform miracles, but these come at an escalating cost.

Between 1950 and 2010, New Zealand's indexed real growth in gross domestic product (GDP) per capita was 133 per cent while the rise in Crown health expenditure was 417 per cent.

This reflects internationally prevailing trends. Healthcare spending across the Organisation for Economic Development and Co-operation (OECD) in the next 40 years is expected to increase from 7 per cent to 13 per cent of GDP.

New Zealand currently spends 10.3 per cent of its GDP on health, coming in at ninth highest of the 33 members of the OECD.

Where are these cost increases arising? One set of factors is the prevalence of chronic diseases – such as type 2 diabetes, cardiovascular disease, cancer, dementia and Parkinson's – that require sustained and frequent contact with the medical system. Another related set (six of the 10 most prescribed medicines in New Zealand being for 'chronic conditions', such as cholesterol, acid reflux, asthma and diabetes) comes in the form of drug costs: from 2000 to 2009 OECD drug costs rose 50 per cent. A third is the expanding use of expensive technologies, such as MRI and CT scans.

## Dramatic demographic shifts

Like most Western nations – and China – where people are generally living longer and having fewer children, New Zealand has an ageing population profile. It is projected that by 2031 one in five of the population (most of them women) will be over the age of 65, and after 2031 the ageing of the population will accelerate.

Accompanying this phenomenon will come changes in our living circumstances. Within 15 years couples without children will outnumber couples with two children as the most common household configuration, and a further 600,000 New Zealanders will be living alone, some struggling with social isolation.

New Zealand's ethnic mix and geographical demography are changing too. New Zealand's Asian population is projected to reach 790,000 by 2026, an increase of 390,000 from 2006, and Auckland's demographic rise continues: it is projected that three-fifths of New Zealand's population growth between 2011 and 2031 will be in Auckland.

These shifts have huge social, health and economic implications. How, for example, do we set about reducing the burden of the chronic diseases associated with – but not necessary consequences of – age\* or the risks of social isolation? What do we do as the ratio of the working population to those no longer working falls? How do we maximise the potential of our ageing population? What should our healthcare system be doing to accommodate New Zealand's changing cultural make-up?

\* Studies have shown that, after controlling for chronic diseases and end-of-life care, ageing is only responsible for 0.1 per cent of annual increases in health costs. Ageing is not a set of diseases requiring complicated geriatric care. Healthy ageing is a time to reap the rewards for a lifetime of contributions to family and society.

People over age 65  
added to world population  
every month:

**870,000**

*Aging World Report, 2008, United Nations New York, 2008*

## 21st-century health careers

The health and social sector is the largest sector in the country (employing one in 10 New Zealand workers, the sector is larger than the engineering and technology sector); it pays well; it has low unemployment; and the job prospects are only going to get better. Between 2006 and 2013 the sector grew by 20 per cent, and up to 40 per cent is projected for the next decade, mirroring international trends.

Who will fill these positions? As matters

stand, 42 per cent of New Zealand's health workforce were trained overseas and many of its members are now late career.

New Zealand's tertiary education providers face a challenge: turning out not just more graduates but graduates who are flexible, know how to solve problems, and have the confidence and experience to hit the ground running. The sector needs systems thinkers and transformational leaders.

Much of the growth will come in postgraduate study. Increasingly, a Bachelor degree is a bare minimum; to advance into management requires more.

Tertiary education providers must rise to the challenge of this fast-changing sector. New occupational categories are emerging (data scientist has been dubbed the "sexiest job of the 21st century" by *Harvard Business Review*) and existing occupations are evolving and extending their scope.

### Established and evolving careers

- Interventional microbiologists
- Virologists and cell biologists
- Immunologists
- Molecular biologists (gene therapists)
- Infection control specialists
- Genetic counsellors
- Nurses, including nurse practitioners, aged-care specialists and home care specialists
- Epidemiologists, bio-statisticians and disease surveillance specialists
- Public health nutritionists
- Health promotion specialists, including policy, marketing and communication experts
- Health protection specialists, including toxicologists and environmental health officers
- Alternative and complementary therapists, especially traditional Chinese medicine
- Social workers
- Disability and rehabilitation case managers and assessors, policy advisors
- Clinical nutrition and dietetics professionals
- Sport, exercise, recreation, and kinetics specialists, including personal and team coaches and recreation co-ordinators
- Sleep specialists, especially as applied to aged care and child development
- Food technologists and engineers
- Enteric disease specialists and inspectors
- Occupational health specialists
- Health promotion



Above: School of Nursing alumnus **Andrew Cameron** was Australian Nurse of the Year in 2004 and has been awarded the Florence Nightingale Medal by the Red Cross. Below: Social-work entrepreneur **Emeline Afeaki**.

### New and emerging careers

- Health analytics and informatics
- Health system planners and policy developers
- Global and international health specialists, including surveillance and travel health specialists and 'screeners'
- Health evaluation specialists
- Social media managers
- Social network interventionists







## An evolving profession

In 2010, of New Zealand's 87,000 health practitioners (doctors, nurses, radiographers, psychologists, dieticians and others), 47,000 were nurses. They are the mainstay of our health system, and the profession's role and scope are only going to expand, says Professor Annette Huntington, the head of Massey's School of Nursing, who is part of this reinvention.

One of the most exciting advances, she says, is the advent of the nurse practitioner, a nurse who practises autonomously within a prescribed scope of practice and who holds prescribing rights.

A nurse practitioner requires an advanced degree credentialled by the Nursing Council of New Zealand. Massey's research-informed Master of Nursing degree is fully credentialled (the School of Nursing has been ranked number one for research in New Zealand<sup>1</sup>) and, says Huntington, a large proportion of New Zealand's nurse practitioners are Massey graduates.

Huntington is immensely proud of the reputation that the school, with its 40-plus-year history, has earned and she looks forward to the cross-disciplinary synergies that will increasingly come in to play as the new College of Health evolves.

A number of such synergies are already in place. Huntington and her colleagues are already working with sport and exercise scientists in a programme that is employing physical activity to help people who have experienced strokes or transient ischaemic attacks and with sleep/wake scientists to mitigate the damaging effects of shift work, not least within the nursing profession itself.

It is projected that population growth and ageing will lead to a nursing shortage from 2020 on, rising to a shortage of 15,000 nurses by 2035<sup>2</sup>.

1. *Performance-Based Research Fund: Evaluating Research Excellence - the 2012 Assessment*, Tertiary Education Commission, April 2013

2. *The Future: Nursing Workforce: Supply Projections 2010 - 2035*, The Nursing Council of New Zealand/ BERL Economics, August 2013

**Professor Annette Huntington** has conducted internationally recognised research into nursing and particularly into the nursing workforce; in 2012 she was made a Member of the New Zealand Order of Merit in the New Year Queen's Honours for services to nursing research. She is the New Zealand Director of both the Nurses and Midwives e-Cohort Study, and the Graduate Nurses Study, in collaboration with Australia, Canada, Ireland and the United Kingdom.



# 15,000

Estimated shortage of nurses in New Zealand in 2035.

## A definition

**'Health'** and **'wellbeing'** mean something more than the simple absence of disease. These are holistic concepts with physical, emotional, cognitive, cultural and spiritual dimensions, and they help to determine every aspect of our lives and those of our societies. Similarly, the determinants of health represent a complex interaction of biological, genetic, social, economic, cultural, political, developmental, behavioural and environmental factors, and not everyone is equally advantaged. Fostering health, health equity and wellbeing, will require action and leadership across a range of individuals, disciplines and organisation sectors.

Left to right: Centre for Public Health Research researcher **Dr Lis Ellison-Loschmann**, Professor **Roger Lentle**, technician **Corrin Hulls** and senior lecturer **Dr Pat Janssen** of Massey's digesta research work group. **Dr Francis Kweku Amagloh** and **Associate Professor Jane Coad** are developing a vitamin A-rich complementary food for infants in developing nations.

## Understanding health and wellbeing

Health and wellbeing are more than the absence or treatment of disease, illness or injury, they are the foundations of life and prosperity.

The health and wellbeing of individuals, families/whānau, hapū, iwi, and other communities and populations are determined by a complex interaction of biological, genetic, social, economic, cultural, political, developmental, psychological, behavioural, environmental and geographic factors that can vary across the lifespan, contexts and populations. Health and wellbeing have multiple interconnected dimensions, including but not limited to, physical, emotional, cognitive, social, cultural and spiritual. This is consistent with Emeritus Professor Sir Mason Durie's Te Whare Tapa Whā model of Māori health. This model affirms health as an holistic concept that is seen like four walls of a house – each interrelated but independent. The four cornerstones of the model include: whānau (family health), tinana (physical health), hinengaro (mental health) and wairua (spiritual health).

The basic prerequisites for health include sufficient amounts of safe, nutritious food, clean water, safe, appropriate shelter, peace, education, a stable ecosystem, adequate income, sustainable resources, and social and distributive justice. The distribution of income and wealth, education, early child support, cultural identity, the ability to participate in and contribute to society, the physical environment, community leadership, autonomy, and other factors and conditions have profound effects on health and wellbeing.

Health and wellbeing are influenced by both individual and collective actions (and inactions) and conditions. Not all people have equal opportunities to achieve or improve health and wellbeing. Therefore, the college acknowledges the need to achieve *both* health and health equity. The college is also clear on the distinction between healthcare and health, while recognising that timely, equitable access to basic, effective care for the treatment of illness and injury can enable health.

The college accepts that efforts to treat and prevent illness and injury, or enhance health and wellbeing, are not the purview of any particular profession or discipline. Rather, enabling and enhancing health and wellbeing, preventing disease and injury, and treating illness require collaborative efforts from individuals, multiple professions, community members and groups, whānau, hapū and iwi, and public, private and non-profit organisations.

Health is a fundamental human right that requires proactive and deliberate leadership, and action from all sectors at local, national and international levels. These actions include: the creation of health-enabling policies (public, organisational, corporate and individual); the creation and utilisation of health-enabling products, services, relationships, environments and contexts; enabling people and organisations to identify and work towards the achievement of their aspirations; the development of knowledge and skills essential for achieving and maintaining health; and enabling and integrating effective services in multiple sectors.



## Mission, vision and values

### Our mission

To enhance and protect human health, health equity and wellbeing through transformational ideas, people and partnerships.

### Our vision

Aotearoa/New Zealand will be a global leader in enabling better health and wellbeing for all.

### Our values

Integrity, excellence, equity, independence, upholding the principles of Te Tiriti o Waitangi/the Treaty of Waitangi.

## Our goals

The college will produce high-quality, innovative research, scholarship, partnerships and teaching programmes that have both national and international impacts; and develop strong, strategic and mutually beneficial partnerships with a broad range of groups including whānau, hapū and iwi. The college accepts that it is responsible for using its talents to enhance society, professions and academia. It will manage its resources to engender positive impacts, diversity, operational efficiency, accountability, growth and stability within the college while building a culture that promotes collective and individual success, growth, excellence and satisfaction for staff. Our actions will be consistent with, and contribute to, the mission, vision, goals, values and strategies of Massey University.

Within Aotearoa/New Zealand, longstanding inequities in health must be addressed by building on the principles of Te Tiriti o Waitangi/the Treaty of Waitangi. The treaty and the college regard Māori and non-Māori as equal partners whose future health and prosperity are bound together. The college will, to the best of its ability and to the extent that its resources and jurisdictional authority permit: act in good faith; actively recognise, respect and protect Māori interests; and respect and incorporate Māori culture and values. It will actively strive to embed treaty principles in all aspects of its work, including the governance and management of the college, schools and research and practice centres/teams.



## Our goals

To focus its work, facilitate the allocation of resources and help measure its performance, the College of Health has set out three impact goals and five enabling goals.

### IMPACT GOALS

- 1 High-quality, innovative and engaging educational programmes and teaching that enhance national and international human resource capacity for human health, equity and wellbeing.
- 2 High-quality, innovative research and scholarship with national and international impacts to enhance human health, health equity and wellbeing.
- 3 Use of our talents, ideas and resources to responsibly and ethically protect and improve the health of our communities, country and humankind (service responsibility).

### ENABLING GOALS

- 4 A global perspective and impacts through teaching, research, service and culturally safe enterprise.
- 5 Strong, strategic and mutually beneficial partnerships and connections within Aotearoa/New Zealand and around the world to enhance our mission.
- 6 Increase and diversify our income as well as use our fiscal, physical, human and intellectual resources efficiently.
- 7 A culture that enables collective and individual success, growth, excellence and satisfaction.
- 8 To embody and promote the principles, obligations and spirit of Te Tiriti o Waitangi/the Treaty of Waitangi within our college.

## Defining features

Solution and impact oriented

Responsive, adaptive and efficient

Innovative, entrepreneurial and enterprising

Diverse

Prevent disease and injury, enable health and wellbeing, integrate health-enhancing services, policies and other instruments

Connection with and support for all sectors, including business

## Who we are

The College of Health/Te Kura Hauora Tangata is solution and impact oriented. We do not simply describe problems, conditions or risks: the measure of the success and impact of our research and teaching programmes is their relevance in addressing significant health issues facing our nation and the world.

Our operating structures, procedures and policies are responsive, adaptive and efficient and our mode of business is innovative and entrepreneurial, – where entrepreneurship is defined by the ability to identify or generate opportunities and innovations and respond in a manner that improves value and social good.

Research tells us diverse communities are more resilient and creative, which is

why we embrace diversity in its perspective, practice, methods, models, students, staff, partnerships and approaches.

The college places a particular emphasis on the prevention of major forms of illness, disease and injury, as well as protecting and enabling health and wellbeing in ways that are equitable and empowering.

The college is distinguished by its collaborations. Our evidence and expertise inform decision-makers and community members, influencing policy, environmental design, products, services and individual and community actions.

The college also works alongside business and private enterprise to conceive, produce, distribute and market products such as food and beverages, health aids and services.

Safe and satisfying jobs, as well as successful, innovative businesses form the basis of a stable, prosperous economy, which is itself an essential determinant of health. Hence we work closely with business to advocate for and develop innovative, effective and ethical health-enabling products, services, policies, structures and practices.

The college values partnerships that embrace excellence, integrity, equity and academic independence, and that uphold the principles of Te Tiriti o Waitangi/ the Treaty of Waitangi.

The college works with businesses and private enterprises to develop, implement and evaluate policies and practices that protect and enable environmental and occupational health. It also independently works to identify products and services that put health at unacceptable levels of risk, and it constructively advocates for the discontinuation of such products and services.

The college works with prospective employers in all sectors, including private enterprise, to prepare the current and future workforce to be highly competent and qualified, innovative leaders and connectors capable of addressing complex problems.



A food pilot plant was opened at Massey University in 2008. It is designed and run under the strict risk management programme guidelines expected in a modern food manufacturing plant. The pilot plant serves as a facility for teaching students traditional and new processing techniques for today's food manufacture. Food manufacturers commission the pilot plant for cost-effective trials of new product formulations. The plant includes a separate room that can be hired for confidential work. Staff and students use the pilot plant for research projects, often sponsored by the food industry. All work in the pilot plant has the support of skilled technicians and scientists with expertise in all aspects of food manufacture.



## Wicked problems and complex solutions

### Complexity theory may help New Zealand to address some pressing issues

How do you address societal problems such as the prevalence of obesity and type 2 diabetes, or the poor diet of many New Zealand children or the incidence of family violence? These are complex issues calling not for one single-fix answer but a mix of approaches.

During a career that has taken him from Porirua City Council to a London housing authority to Child, Youth and Family and on to academia, Dr Mat Walton has spent most of his professional life thinking about 'wicked problems' like these.

He has witnessed first hand the way that systems succeed and fail – that organisations evolve, that different interventions interact, and that any action can lead to chains of intended and unintended consequences. He has witnessed, in other words, the workings of what is known as 'complexity theory'.

What would be a good real-world example? Take the issue of food security: the physical and economic access to sufficient, safe and nutritious food to meet the dietary needs and food preferences for an active and healthy life, according to the United Nations' definition. While studying for his PhD, Walton was enlisted as a team member

in a study of food security and physical activity in low-income Māori and Pasifika families.

Whether a household is food secure or food insecure is the result of multiple interactions, he explains. "It relates to income, to the number of people living in the household, to their knowledge of nutrition, to their distance from the supermarket, to their access to a car or public transport, to the number of hours they work – if they are employed." And complexity theory says that the success of interventions will vary. Some will be absorbed without impact, many will become less cost effective as they scale, and, in rare instances, some will change the nature of the system itself. Complexity theory, says Mat, won't tell you precisely what will happen, but it can be used to map out the dynamics of a system and help generate a range of scenarios that could follow an intervention.

Walton's current interest is in how complexity theory applies to evaluation methods (his Marsden Fast Start-funded project is called 'Developing complex evaluation strategies for wicked problems') and in seeing complexity theory and systems thinking put to practical use by policymakers.

In April of 2014, the High-Value Nutrition National Science Challenge – the first of 10 National Science Challenges – was launched by the Government. The multi-million-dollar initiative, led by University of Auckland, will see Massey University, the University of Auckland and the University of Otago, along with Crown research institutes AgResearch and Plant & Food Research, work alongside other collaborators to undertake the cutting-edge, multidisciplinary research that New Zealand companies will need if they are to take advantage of the global demand for foods with health benefits. One of the challenge leaders is Massey's **Professor Marlena Kruger**, an expert in bone and joint health whose work helped to establish the benefits of the high-calcium milk product ANLENE™, a Fonterra-owned adult milk brand formulated to encourage optimal bone health and sold across Asia.



Food scientist **Dr Marie Wong** helped pioneer the avocado oil industry, assisted the prize-winning firm Heilala Vanilla in product development, and is currently advising the olive oil industry.

### Transformative 21st-century education

We offer distinctive, leading-edge teaching, through problem-based, experiential learning, a multidisciplinary approach, a multi-determinant view of health and a whole-systems orientation.

Experiential learning enables students to develop the skills and confidence to work in applied settings. It includes internships, practicums, co-operative work placements, thesis projects, the use of simulation labs and activities,

site visits, field trips, exchanges, and professional consultations.

Our students produce and employ high-quality evidence, solving challenges through creativity, innovation, connectivity and perseverance. Our programmes are competency based, enabling graduates to pursue professional and academic career paths and creating entrepreneurial and transformational leaders.

Our distinctive systems approach

emphasises the dynamic interrelationships of variables and structures at multiple levels – from cells to society – over time. A systems orientation is useful for making the implicit assumptions about complex phenomena explicit. This helps us to develop interventions that account for dynamic interactions and to run simulation models that generate ‘alternative futures’. Students learn formal systems theory and systems science.

## Not just in our DNA

### Good news: the way we live regulates our gene expression.

Dr Michelle Thunders was one of those kids. “I was always asking, ‘Why mum? Why mum, why? Why are we different? How does this work?’,” the lecturer in life sciences remembers. “I must have driven my mother insane.”

So when it came to her choice of study at university in the 1990s, genetics seemed ideal, the ultimate in how-and-why. Here was life’s essence distilled in the four-letter nucleotide alphabet.

It was a time of scientific excitement. During Thunders’ time as an undergraduate, the first complete genome for a living organism was published, and by the time she had finished her PhD (both degrees at London’s UCL) and embarked on postgraduate work on the genetics of Alzheimer’s disease, the complete human genome existed in draft.

But deciphering the human genome has not been quite the same as being able to turn it to medical advantage. The workings of the genome have proved to be unexpectedly complex, and it does not act alone, but is expressed, as Thunders puts it, “in a complex

interplay with the environment”. Indeed, in a phenomenon called epigenetics, that interplay can contribute to both changeable and heritable characteristics: our experience of life may affect not just our health but potentially the health and wellbeing of our children and



Director of Teaching and Learning, geneticist **Michelle Thunders**.

grandchildren. It is understanding epigenetics – particularly the role of our environment, diet and exercise in regulating gene expression – that now most interests Thunders, and not just at an abstract level. “It’s fine doing

beautiful science, but we need to translate what we do to a population level so that it has an impact on the health of New Zealanders.”

The other aspect of Thunders’ professional life is her passion for teaching, something that Thunders, cripplingly shy as a schoolgirl, discovered during her PhD. Teaching, says Thunders (who now holds the college position of Director of Teaching and Learning), lets her break down a topic to the point where she knows she truly understands it, and it lets her pass on that all-important sense of enthusiasm.

She finds the hows and whys of conveying knowledge fascinating. Today’s students, she says, are, in technological terms, generationally different from their teachers. Thunders only acquired a computer when she began her PhD. “My students will come to my lectures with their own devices. They will consult the notes in the online learning environment. They may have my lecture videoed.”

The teaching environment should be tailored to the needs of this new generation. This means fewer marathon PowerPoint presentations and a greater emphasis on shorter, bite-sized presentations and on collaborative, experiential, case-study-based learning.

“We want to produce graduates who have the skills and confidence to go out and solve big problems.”

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The other aspect of Thunders’ professional life is her passion for teaching, something that Thunders, cripplingly shy as a schoolgirl, discovered during her PhD.

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Exercise physiologist **Dr Lee Stoner** is one of the people who runs Massey on the Move, a multidisciplinary paper delivered by the College of Health in partnership with the University of Georgia (UGA), USA. As part of the paper students and staff from both universities travel across Australia.



Biology, sociology, psychology, ecology, and anthropology came to life for us as we swam with sea turtles amidst undersea forests on the Great Barrier Reef, hiked across the rocks of Ubirr to experience a collective shiver of awe as we saw the sun settle over the billabongs at Kakadu and listened, with tears in our eyes, to a brave lady in Katherine who relayed her mother's experiences as one of the many indigenous children of the 'Stolen Generation' who were ripped from their families in the early 20th century...

Student Karajane Chapman writes about her experience of Massey on the Move.

## Defining research areas

Prevention of chronic and infectious diseases and injury

Healthy ageing, human development, and optimum performance

Food and nutrition to enable health, health equity, wellbeing and economic prosperity

Health equity and inclusion (with a particular focus on Māori and indigenous health)

Health systems, care integration and reform

Environmental and occupational health

## Solutions-based research and enterprise partnerships

Our research activities add value to society and provide a positive return to investors and partners.

We focus on six signature research platforms: the prevention and management of chronic and infectious diseases; the challenges posed by a rapidly ageing population, enhancing children's development, and optimising human performance; food and nutrition for health, health equity, wellbeing and

economic prosperity; health and healthcare system reform and integration through informatics, analytics, and workforce planning and development; reducing health inequities, especially those applying to Māori and indigenous peoples; and environmental and occupational health.

Our approach to these signature research platforms is cross-school and multidisciplinary.

Professional clinician and social work staff member **Helen Simmons** visits Palmerston North community member **Roni Fitzmaurice**.





## A third of our lives

### The Sleep/Wake Research Centre

In a building within a building on Massey's Wellington campus lies a domain without time or season, a pristine, window-free complex of bedrooms, living spaces and testing laboratories where the temperature is constant and the lighting, coming from the ceiling panels, is evenly dispersed and eerily flat. This is the Sleep/Wake Research Centre's new time isolation unit. Professor Philippa Gander finds it serene. "I sometimes think I could live here," she confesses.

For all sorts of reasons, this is a good time to be a sleep scientist, says Gander. The practical worth of the research evidence accumulated in the discipline's 60-year history is now widely accepted, particularly by those sectors and industries where shift work, night work and extended working hours are commonplace.

In the air travel industry, the Sleep/Wake Centre has worked with an international roll call of well known airlines, aircraft manufacturers, unions and regulators. In the health sector, it has work underway to help junior doctors manage the demands of shift work.

"Industry can see how we can make a difference in terms of productivity, safety, efficiency and flexibility," says

Dr Leigh Signal, the centre's Associate Director.

But the importance of sleep to society runs much more broadly, says Gander, affecting every aspect of our health and wellbeing. This is, after all, an activity to which we devote roughly a third of our lives, something programmed into our biological machinery by our evolutionary past.

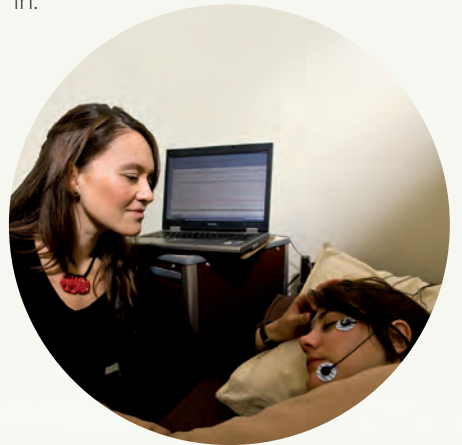
So what happens when society defies biology and becomes a 24-hour, seven-day-a-week affair? The experiment is already well underway, and some of the results are unfortunate. Sleep – or the lack of it – links to our epidemic rates of diabetes and obesity, says Gander, and the correlation between shift work and social disadvantage may explain some of today's health disparities. "The more we understand about the physiology of sleep and the way it works, the better equipped we are to help people lead healthier lives," says Gander.

It is that fundamental understanding of the nature of sleep that the new time isolation unit will help the centre's researchers to explore.

Replacing an earlier three-bed unit, the internationally compliant four-bed

unit will let the Sleep/Wake Research Centre collaborate in multicentre studies.

"It is kind of cool to be working at the coal face, doing basic science in our time isolation unit, figuring out how things work at the very intricate level, right through to seeing how your science is applied at the policy end of the continuum," says Signal. "This is a phenomenally exciting area to be working in."



Above: Senior Research Officer **Dr Sarah-Jane Paine** at work. Below, left to right: **Professor Philippa Gander**, Director of the Sleep/Wake Research Centre, **Dr Leigh Signal**, Associate Director and Senior Research Fellow, and **Dr Karyn O'Keeffe**, Research Fellow and Associate Director (Academic).



**Schools** develop and maintain high-quality, efficient academic programmes.

**Research centres and teams** undertake world-class research, addressing the issues and problems embraced by our signature platforms. They facilitate collaboration and share multidisciplinary expertise and data.

**Professional practice centres** provide timely, high-quality consultations, evaluations and advice to external partners.

## Our structure

The College of Health is built around a core of schools, of independent world-class research centres, and of professional practice centres.

The college currently has five schools (the School of Social Work, the School of Nursing, the School of Sport and Exercise, the School of Public Health and the School of Food and Nutrition); nine research centres (the Riddet Institute, the Centre for Public Health Research, the Sleep/Wake Research Centre, the SHORE and Whāriki Research Centre, the Research Centre for Māori Health and Development; the Centre for Ergonomics, Occupational Safety and Health, the Vitamin D Research Centre, the Centre for Postharvest and Refrigeration Research and the Roof Water Research Centre); and four professional practice centres (the Vascular Rehabilitation

Clinic, the Practice Research and Professional Development Hub, the Paediatric Infant Feeding and Nutrition professional practice centre, and FoodPILOT).

In the future, more research centres and professional practice centres will join this list. The new centres will respond to specific health-related challenges, such as healthy ageing, metabolic health, the advancement of foods for health, disabilities and rehabilitation, improving access to healthy housing, water safety, and food security. The professional practice centres will provide consultations, evaluations and advice to our partners, helping them to address their short- and long-term challenges.

External agencies are invited to appoint and fund highly qualified staff within our college.

Students relaxing on the Albany campus.





# Strategic plan

## Schools

Our schools are structured around our professional programmes, including nursing, nutrition, public health (including environmental health, disability, rehabilitation, occupational health and health promotion) and social work.

They also highlight specific career paths in sport and exercise, food technology, human biomedical sciences, medical laboratory science, healthcare

systems, informatics and analytics, and international health.

Each school will host one or more signature degrees at undergraduate, Masterate and Doctorate levels. Professional schools will offer qualifications to meet the needs of future evidence-informed health practitioners and practice-informed researchers.

The college is exploring the creation of a School of Māori and Indigenous

Health. This will complement the components of Māori and Pasifika health in our existing programmes.

We will also consult staff, students and stakeholders about creating a new School of Health and Biomedicine, a mantle that includes human physiology, interventional microbiology and biochemistry (biomics), immunology, medical laboratory science and human genetics.



## Our five schools

### School of Food and Nutrition

The School of Food and Nutrition is a leader in food and health innovation in New Zealand, offering integrated research and education across the entire food and health value chain. The school maintains expertise in food science and technology, human nutrition and dietetics. Among its facilities is FoodPILOT, a sophisticated, multi-million-dollar food pilot plant on the Manawatū campus. This is used for teaching and research and is available for commercial use by food manufacturers wishing to trial new product formulations. Academic staff currently involved in physiology and life sciences may form the core of a new School of Health and Biomedicine.

### School of Social Work

The School of Social Work conducts research on the impacts of social problems on diverse populations, about the social work profession and to enhance social work practices with individuals and groups, among organisations and across the community. It offers recognised professional qualifications for registration as a social worker, continuing professional education courses and advanced research degrees. Our graduates are highly regarded both within New Zealand and internationally (for example Australia and the South Pacific, North America, the United Kingdom and Europe).

### School of Public Health

The School of Public Health embraces disability, rehabilitation, occupational safety and health, environmental health, health promotion and Māori health. Our students and staff also collaborate with four of our major research centres: the Centre for Public Health Research, the SHORE and Whāriki Research Centre, the Sleep/Wake Research Centre and the Research Centre for Māori Health and Development. The school is actively exploring new academic programmes in health services, programme evaluation, health analytics and healthy ageing as well as New Zealand's first undergraduate programme in public health.

### School of Nursing

Massey's School of Nursing was ranked the highest in New Zealand for research in the Government's 2012 Performance-Based Research Fund assessment. The school's undergraduate nursing degree is taught in Auckland, Palmerston North and Wellington. The school offers an extensive postgraduate programme and is New Zealand's leading provider of nurse practitioners.

### School of Sport and Exercise

The School of Sport and Exercise is one of New Zealand's most innovative researched sport and exercise academic groupings, with a strong record of research and teaching. Education programmes include specialisations in exercise prescription, sport management, coaching and physical education. The school maintains laboratories on each of Massey's campuses: the Human Performance Laboratory on the Manawatū campus, the Sport Science and Research Laboratory on the Wellington campus, and the Sport and Exercise Science Research Laboratory on the Albany campus. Many of New Zealand's most successful elite sportspeople can be counted among the school's students and alumni.



Linking huge amounts of data and identifying patterns may be key to addressing big problems in public health, social science and business. **Dr Andy Towers** of the School of Public Health, is working on New Zealand's first 'Big Data on Older Adults' project. Part of Massey's award-winning Health and Ageing Research Team, Dr Towers is working with the Ministry of Health to determine key health, social and economic factors underpinning disease in older New Zealanders.



Blueberries may be the food of champions. **Professor Steve Stannard** of the School of Sport and Exercise (picture on opposite page) has found that athletes who eat blueberries recover from exercise more quickly than those who don't. The findings have been published in the *Journal of the International Society of Sports Nutrition*.



Olympic gold-medallists **Hamish Bond** and **Eric Murray** are among the many elite athletes who have studied with the School of Sport and Exercise.

## Not just about bones

### Vitamin D is more important than you may think

Dr Pamela von Hurst is a believer in restorative power of sunshine for a well founded scientific reason: its central role in allowing the body to synthesise vitamin D. For vitamin D, which until recent times was typecast for its role in the body's calcium economy and bone health, turns out also to be crucial to the proper operation of the immune system.

This may be something you have experienced. "Think about that bout of cold or 'flu you pick up right towards the end of winter, when it is starting to get warmer," says von Hurst. "Often that will be because the vitamin D you stored up over summer is virtually exhausted."

Or, on the other hand, vitamin D deficiency can be associated with much more serious conditions.

Multiple sclerosis (MS), type 1 diabetes and rheumatoid arthritis – all of them diseases where the immune system has turned against its host – are associated with low vitamin D levels, particularly during pregnancy, infancy and childhood, says von Hurst.

It was as a mid-life PhD student that von Hurst fell under the thrall of vitamin D. In her first career she had worked in the hospitality and recreational diving industries, travelling the world to exotic locales, but she had always been interested in health and nutrition, and when Massey announced that a BSc in nutrition would be offered on its Albany campus she threw in the company car and the expense account and enrolled.

For her PhD von Hurst conducted an intervention trial in women who were vitamin D deficient and insulin resistant. "I got quite a good result," she says. She was fascinated: vitamin D was not a topic she could leave alone.

The year after she graduated with her PhD, von Hurst was given a \$150,000 Health Research Council emerging researcher grant to pursue a study of vitamin D deficiency risk and its association with respiratory and allergy-related diseases in one- to four-year-olds. On the basis of goodwill, von Hurst

and her co-workers prevailed upon pharmacies around the country to use a simple pinprick blood test to assay vitamin D. Eventually, 1350 children were tested, from the top to the bottom of New Zealand. The results are now being compiled.

But it is a study just getting underway, an investigation into the links between autistic spectrum disorder (ASD), vitamin D and omega-3 fatty acids, that von Hurst is interested in talking about. Although, she says, the literature is sparse, there are case studies and anecdotal evidence showing that children with ASD have lower vitamin D levels than their peers;

and in a few individual case studies high-dose vitamin D supplements have been associated with some amelioration of ASD symptoms.

"But there is nothing in the literature about anyone having done any proper gold-standard randomised control trials."

Then there is the matter of omega-3. "We are also interested in the role of omega-3 fatty acids in the brain, because they are absolutely critical for proper brain functioning. Children with ASD often have quite restricted diets with a very low intake of omega-3 fatty

acids."

In the trial, which is being carried out in conjunction with the Waitemata District Health Board, the participants will be divided into four groups: one to be given a vitamin D supplement, one to be given an omega-3 supplement, one to be given a combined vitamin D and omega-3 supplement and, finally, one to be given a placebo.

Here, von Hurst has been lucky enough to enlist the support of Sir Graham Douglas and CEO Andrew McLeod of Douglas Nutrition, which, in a philanthropic gesture, is manufacturing and donating the supplements and placebo.

Does von Hurst yearn for the days of international dive junkets? Not for a moment. "This is the job that gives me the most satisfaction, because it is constantly meaningful. That's what you want."



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"But there is nothing in the literature about anyone having done any proper gold-standard randomised control trials."

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## Finding our way

Increasingly the world is outliving its eyesight. In the United Kingdom it is estimated that one in 12 people will have serious sight loss by the age of 60, rising to one in six by the age of 70, and once past the age of 80 one in every two people will be vision impaired.

This matters more than it did, for New Zealand, like most Western nations, is greying. “We need to find ways to ensure that people who stay at home and age in place do so successfully, without being at risk of injury and social isolation,” says Professor Steven La Grow (pictured), whose research speciality is rehabilitation for the blind.

Fortunately, technology is advancing apace. Computers, e-readers and global positioning systems (GPSs) are materially improving quality of life for the visually impaired.

Accessible GPSs (AGPSs) – GPSs that offer synthetic voice output and screen readers, and may take the form of software on cellphones or of dedicated hardware – are of particular interest to La Grow, who led a study of their use by a sample of 300 blind people.

“They take almost all the anxiety out of travel. We have found that the most valued aspect of the AGPS is the ‘where am I?’ button. Press the button and the AGPS will give you your relative location on the street, telling you the house numbers, the direction in which you are travelling, and the name of the next intersecting street.”

**Steve La Grow** is the Professor of Rehabilitation and Deputy Pro Vice-Chancellor of the College of Health. He has more than 30 years of experience teaching and researching in the area of rehabilitation for those who are blind or have low vision. His research focuses on the rehabilitation of those who have experienced late onset vision impairment with a particular emphasis on interventions designed to restore losses in orientation and mobility, the most disabling consequences of vision impairment.



# Strategic plan

## Research centres

Our research centres facilitate world-class applied research, identifying and working with partners from across the university and beyond. The centres collaborate across disciplines, across schools and with other centres. Funded

by a range of national and international bodies, commercial and governmental, the centres attract, mentor and upskill promising postgraduate students.

Over time, new centres will be created to address 21st-century issues of moment,

such as healthy weights, healthy ageing, child wellbeing, health workforce planning, healthy food development and preservation, healthcare systems design and integration, biotechnics and microbiomics.

### Research centres

#### Riddet Institute

The Manawatū campus-based Riddet Institute is dedicated to expanding the scientific knowledge of foods, food structures, and digestive and metabolic processes.

Established in 2003, the institute was accorded Centre of Research Excellence status in 2007. Drawing on a national and international multidisciplinary network of exceptional researchers, the institute has world-class competency in food materials science, in human digestive biology relating to nutrient absorption, and in the consequent effects on whole-body metabolism and health. It is funded by the Government and industry.

#### SHORE (Social and Health Outcomes Research and Evaluation) and Whāriki Research Centre

The SHORE and Whāriki Research Centre, located in Auckland, comprises two groups working in a Treaty of Waitangi partnership model. SHORE (Social and Health Outcomes Research and Evaluation) and Te Rōpū Whāriki are multidisciplinary teams undertaking policy and collaborative community research on and evaluations of a variety of health and social topics. The centre is also committed to capacity-building through training opportunities and postgraduate supervision.

#### Centre for Postharvest and Refrigeration Research

The Centre for Postharvest and Refrigeration Research is based on the Manawatū campus. Its scope is research into and consultancy on refrigeration

technologies and grading, packaging, storage and transport technologies that enable the efficient and effective delivery of high-quality, health-promoting fresh and processed products to New Zealand and global markets.

#### Sleep/Wake Research Centre

The Sleep/Wake Research Centre takes an integrated approach to sleep and waking health, safety and productivity. It conducts multidisciplinary research to increase scientific knowledge and works with industry, governments, and community groups to provide scientifically based solutions to the health challenges posed by disturbed sleep and the 24/7 society.

#### Centre for Public Health Research

The Centre for Public Health Research provides high quality training and conducts world-class research in epidemiology and public health with a primary focus on non-communicable disease, Māori and Pacific health, occupational and environmental health, socioeconomic determinants of health and health surveillance. Its broad aims are to prevent disease and promote and protect the health and wellbeing of populations, communities and individuals. The centre is based on the Wellington campus

#### Research Centre for Māori Health and Development

The Research Centre for Māori Health and Development is made up of several research programmes. These programmes focus on Māori health and Māori

development research and also include a large capacity-building component. A student mentoring scheme forms a large part of the centre's activities and is designed to further bolster Māori research capability. The centre has developed a strong reputation for undertaking research of contemporary relevance to Māori and that can be translated into positive gains for Māori. Current studies include a major investigation into the components of Māori wellbeing, and New Zealand's only longitudinal study of Māori whānau.

#### Vitamin D Research Centre

The Vitamin D Research Centre provides an umbrella for the diverse range of vitamin D research interests of Massey staff. Researchers have expertise in a number of physiological conditions and lifecycle stages where vitamin D deficiency is potentially damaging to health in both the short and the long terms.

#### Centre for Ergonomics, Occupational Safety and Health

The Centre for Ergonomics, Occupational Safety and Health brings together the university's expertise in ergonomics and occupational safety and health. Its academic offerings include a United Kingdom-accredited Graduate Diploma in Occupational Safety and Health, a Postgraduate Diploma in Ergonomics and a Master of Ergonomics.

#### Roof Water Research Centre

The Wellington campus-based Roof Water Research Centre conducts research, education and outreach activities that address safe and sustainable rainwater harvesting practices.





## Feeding the world – and the market

### The Centre for Postharvest and Refrigeration Research

In an increasingly hungry world, it is disturbing to know that between 30 and 50 per cent of all food that is grown globally is wasted – although where that waste is generated depends on where you are. In rich nations, such as New Zealand, fruit and vegetables are left behind or thrown out because they are out of specification, or thrown out by consumers when they are longer fresh. Professor Julian Heyes, who heads the Centre for Postharvest and Refrigeration Research, cannot do much about this: he puts it down to consumer choice.

In the developing world, however, things are different and here he can make a difference: “The type of waste that happens in the developing world is true rot – the produce is picked but it never gets to a marketplace; it rots along the way.”

As a postharvest scientist, Heyes’ speciality is making sure that that doesn’t happen. To help the developing world to reduce waste, he serves on the Ministry of Foreign Affairs and Trade’s Agricultural Services Advisory Panel, works closely with Volunteer Service Abroad, and is part of a community development and agricultural aid initiative in east Indonesia, making sure that the proper emphasis is given to getting produce to market in good condition.

This is one side of Heyes’ work. The other is using postharvest technology to improve New Zealand’s export prospects. The \$1 billion kiwifruit export industry depends on postharvest technology – on controlled temperatures and the controlled release of the volatile fruit-ripening hormone ethylene – to deliver fruit to market in optimum condition, and Heyes is working to see if whether, given the right handling and postharvest regime, fruit such as feijoa can also establish a beachhead in overseas markets.

For Heyes, the College of Health is an opportunity for him to explore another aspect of postharvest storage: the health benefits associated with the produce.

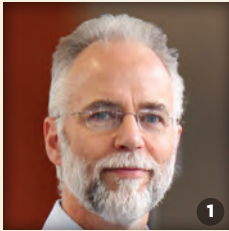
“We are working with experts in nutrition and physiology to identify bioactive compounds that address particular conditions at particular stages,” says Heyes. “It is very careful, very meticulous work, and it’s a breath of fresh air for me.”

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“The type of waste that happens in the developing world is true rot – the produce is picked but it never gets to a marketplace; it rots along the way.”

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## Centre directors



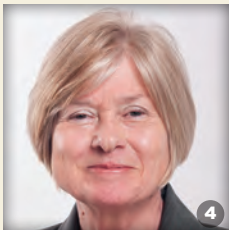
**(1) Professor Julian Heyes** is the Director of the **Centre for Postharvest and Refrigeration Research** and leads a large team of postharvest graduate students working to optimise fruit, vegetable and cut-flower storage. He has a strategic interest in connecting science to the growth of the horticulture sector based on novel, high-value niche products and is increasingly working on programmes relating fruit and vegetable consumption to human health.



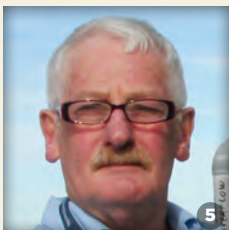
**(2) Professor Jeroen Douwes** is the Director of the **Centre for Public Health Research**. Douwes is internationally recognised for his work on asthma and indoor and occupational health. His current research programme focuses on asthma causation, mechanisms and prevention.



**(3) At right: Professor Helen Moewaka Barnes** (Ngāti Wai/Ngāti Hine/Ngāti Manu) is the Director of **Te Rōpū Whāriki** and Co-director of the **SHORE and Whariki Research Centre**. Her recent research has encompassed relationships between the health of people and the health of environments, sexual coercion, alcohol and youth wellbeing and identity.



**(4) Professor Sally Casswell** is a social scientist, the Director of **SHORE** and Co-director of the **SHORE and Whariki Research Centre** at Massey University. Her research interests are in social and public health policy, particularly in relation to alcohol and other drugs. She has a particular interest in the development and implementation of healthy public policy at the community level and in the evaluation of these initiatives, including strategies to reduce the exposure of young people to alcohol marketing.



**(5) Senior Lecturer in Microbiology and Communicable Diseases Stan Abbott** is the Director of the **Roof Water Research Centre**, which generates, integrates and disseminates information through research, education and outreach activities that address safe and sustainable rainwater harvesting practices.



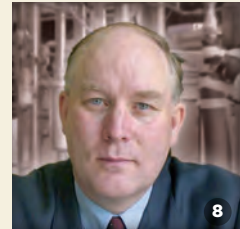
**(6) Associate Professor Te Kani Kingi** is the Director of the **Research Centre for Māori Health and Development**. He has a specialist interest in mental health research, psychometrics, and Māori health.

**(7) Professors Harjinder Singh** and **(8) Paul Moughan** are the Co-directors of the **Riddet Institute**, a national Centre of Research Excellence focusing on food structures and digestive physiology. **Professor Moughan's** research has encompassed the fields of human and animal nutrition, food chemistry, functional foods, mammalian growth biology and digestive physiology. He has published in excess of 350 scientific works. **Professor Singh's** research interests include the structures and interactions of polysaccharides and proteins, the structural changes in food materials during digestion, and the encapsulation and delivery of bioactive compounds. He has published more than 270 research papers in international journals, and holds ten patents. In 2012 Moughan and Singh were jointly awarded the Prime Minister's Science Prize – New Zealand's most prestigious award for scientific achievement.

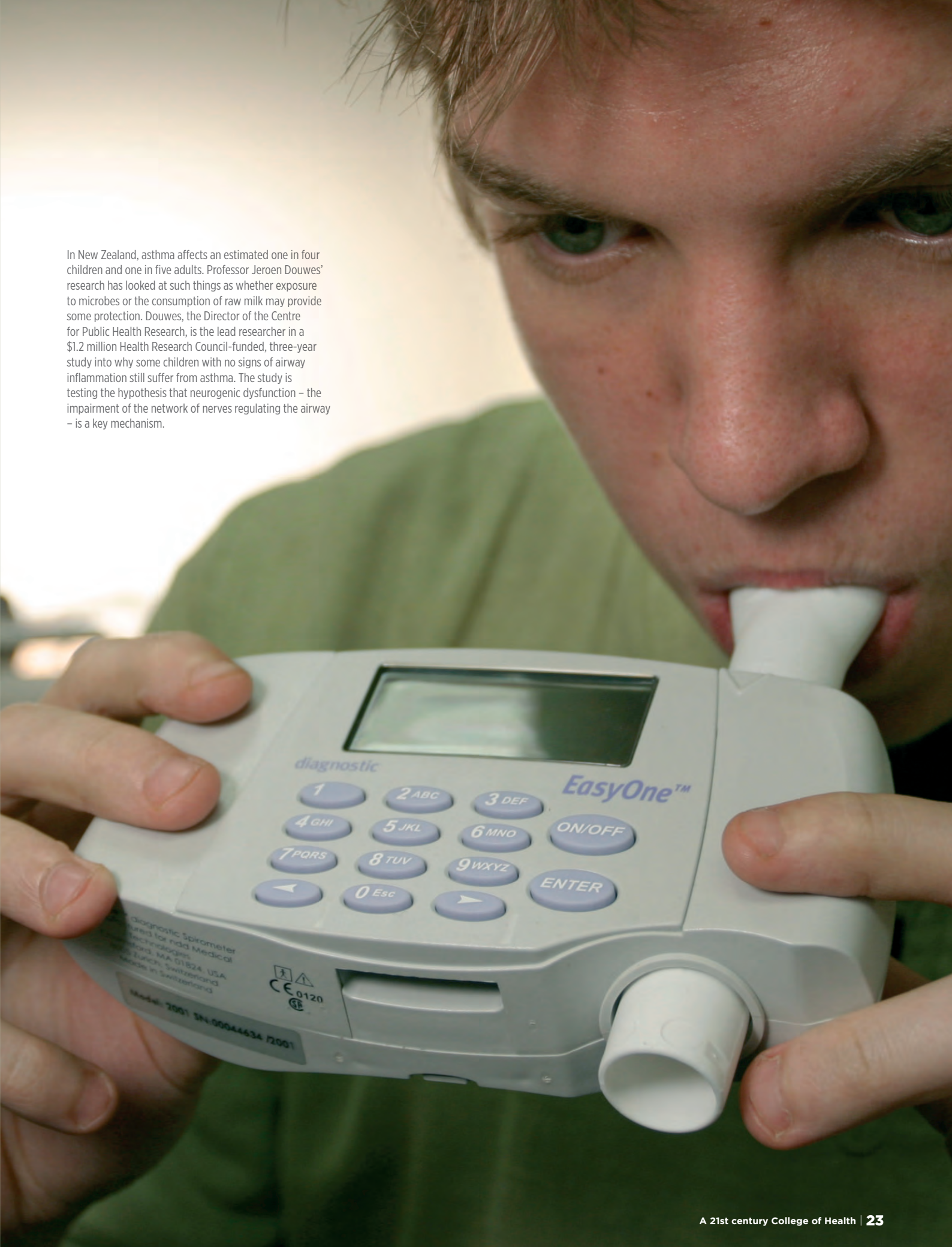
**(9) Professor Philippa Gander** is the Director of the **Sleep/Wake Research Centre**. Her interests include sleep and circadian physiology, fatigue risk management in transportation and healthcare, the epidemiology and diagnostic and treatment services of sleep disorders, and sleep across the lifespan.

**(10) Professor Stephen Legg** is the Director of the **Centre for Ergonomics, Occupational Safety and Health**. His current research interests include sailing science, educational ergonomics, musculoskeletal discomfort at work and health and safety in small businesses.

**(11) Associate Professor Jane Coad** and **(12) Dr Pamela von Hurst** are co-Directors of the **Vitamin D Research Centre**. Coad's research interests include vitamin D and addressing iron deficiencies. Von Hurst's research interests include vitamin D in health and disease, child health and nutrition, bone health, metabolic syndrome and physical activity.



In New Zealand, asthma affects an estimated one in four children and one in five adults. Professor Jeroen Douwes' research has looked at such things as whether exposure to microbes or the consumption of raw milk may provide some protection. Douwes, the Director of the Centre for Public Health Research, is the lead researcher in a \$1.2 million Health Research Council-funded, three-year study into why some children with no signs of airway inflammation still suffer from asthma. The study is testing the hypothesis that neurogenic dysfunction – the impairment of the network of nerves regulating the airway – is a key mechanism.



## Strategic plan

### Professional practice centres

Professional practice centres provide independent, fee-for-service consultation services to help solve clients' challenges in areas such as programme and policy development and evaluation, health informatics and analytics, health communication and marketing, food engineering, and fitness, nutrition, and health assessments.

The centres' staff and students respond rapidly to stakeholders' needs for assistance and expertise. The centres create opportunities for students to practise their skills in programme and policy development and evaluation, survey design, implementation and interpretation, fitness and nutrition assessments, informatics and marketing.



**Professor Robyn Munford** is interested in social and community work practice, theory and research; community development; disability; strengths and citizenship approaches; reflective practice; children, youth and families; family support and wellbeing; bicultural frameworks; research methodologies; action research; and strategies for translating research findings into practice.

### The Practice Research and Professional Development Hub

The Practice Research and Professional Development Hub provides opportunities for staff in the School of Social Work to engage in practice research and offers professional development programmes for social service and

related organisations. Professor Robyn Munford (pictured) is the hub's Director. She helps organisations to reflect critically on their practice and develop their service delivery frameworks to work more effectively with their clients.

### Paediatric Infant Feeding and Nutrition

Established in 2011, PiFaN is intended to become a source of expertise and world-leading research on feeding and nutritional issues in infancy and childhood.

Feeding issues in children can range in severity from fussy eating in an otherwise healthy child to the complete rejection of oral intake in a child who has been tube-fed since infancy. PiFaN aims to

create an environment where children with feeding issues can be accurately assessed and treated by well trained practitioners throughout New Zealand. PiFaN will develop evidence-based treatment programmes that will be made available to health professionals via a range of training modes including courses, study days, workshops and symposia.

### The Vascular Rehabilitation Clinic

The symptoms vary. Perhaps, suddenly and inexplicably, you find yourself confused, or having trouble listening or speaking. Perhaps you are dizzy, unstable or unco-ordinated, or your face, arm or leg – particularly on one side of your body – becomes numb or weak. Perhaps your eyesight – particularly in one eye – blurs. If so, seek immediate medical help. These are some of the symptoms of a stroke and its near relative, a transient ischaemic attack or TIA. "Time is brain," say the clinicians. The longer you delay, the more serious the consequences.

Every day around 22 New Zealanders suffer strokes. This is the third most common cause of death in New Zealand, a leading cause of disability – around half of stroke survivors will be permanently disabled – and a major financial drain on the health system. According to sport and exercise scientist Dr James Faulkner, the

### FoodPILOT

Opened in 2008, FoodPILOT is a modern food manufacturing plant serving several purposes. It is used to teach students food processing techniques, it is used for research, and it is commissioned by food manufacturers to trial new product formulations. The plant includes a separate room that can be hired for confidential work and it is supported by skilled



**Senior Lecturer in Exercise Prescription, Dr James Faulkner** has been researching the efficacy of a multifactorial programme (exercise and education) as an early treatment strategy for stroke/TIA patients to reduce recurrent vascular events and cardiac risk factors and improve cardio- and cerebrovascular health.

instigator and leader of the Vascular Rehabilitation Clinic, it has been estimated that the average lifetime healthcare cost for a stroke patient in Wellington – which is where Faulkner is based – is \$82,000.

Strokes are taken seriously by the health system, says Faulkner. They trigger regimes of clinical care and rehabilitation. But it may be that the less serious diagnosis of TIA, which does not in itself indicate serious or long-term damage, justifies greater attention.

A meta-analysis of multiple studies has shown that the short-term risk of stroke after a TIA is 3 to 10 per cent at two days and 9 to 17 per cent at 90 days, and it has been reported that about one in 10 stroke patients will die within 12 months of a first TIA diagnosis.

So Faulkner, working in close association with Dr Jeremy Lanford,

lead stroke physician at Wellington Hospital's neurology department, has set up an on-campus vascular rehabilitation clinic for people who have suffered TIAs or mild and non-disabling strokes.

Faulkner has just returned from one of the clinic's sessions, putting five patients, ranging in age from 43 to 78, through individual exercise programmes. "So today I had one patient who completed a two-kilometre walk on the treadmill, followed by an 8.5-kilometre cycle on the bike at a lower intensity, and I had another individual who was three or four weeks earlier in their programme and they were walking maybe one kilometre and cycling four kilometres, so about half the amount of work. Each patient is given an optimal exercise regime, and we constantly monitor their heart rate, blood pressure and perception of exertion to ensure their safety."

Sport and exercise students help supervise the programme, working alongside senior staff. All are qualified in advanced first aid and a defibrillator – as yet unused – is to hand in case of emergency.

The clinic also includes a strong educational component, with Faulkner's colleagues in the College of Health explaining the importance of keeping to the medical prescription and of regulating diet, exercise and sleep to manage risk factors such as hypertension. Web-based support is also available.

Around 120 participants have been through the programme to date, but Faulkner has ambitions to take it much further. "We need to show that the clinic is physiologically and psychosocially important for the patient and financially viable for the district health board, and in the end pays for itself in long-term health savings. Then maybe something like this can go nationwide."

technicians and scientists. FoodPILOT is suited for making a large number of variants of a new product in a short time while using full-scale processes and equipment. It is one of four hubs – the others being FOODBOWL (Auckland), FOODWAIKATO and FOODSOUTHISLAND – that make up the New Zealand Food Innovation Network (NZFIN).



## Building on educational success

We provide leading-edge, innovative, relevant and focused educational programmes. To this end, we will:

- Ensure the broad use of problem/case-based learning.
- Ensure that degree programmes have an experiential element.
- Ensure that qualifications are multidisciplinary in nature and problems are identified as multi-determinant.
- Prepare students to be entrepreneurial and transformational leaders.
- Ensure that graduates of College of Health programmes are systems thinkers.
- Be flexible in the delivery of programmes and papers.
- Increase the distinctiveness of our programmes by location/method of delivery (i.e., have distinctive programme offerings associated with our various campuses and modes of delivery) to improve access by international students, mature students, students with commitments to family/whānau, persons with disabilities, those with full- or part-time occupations, elite athletes and others.
- Explore the development of new degree programmes in areas such as health promotion, public health, social work, health evaluation, health and health system informatics and analytics, and health service planning, management and integration.
- Revise or explore the development of new major and minor offerings/specialisations and postgraduate qualifications as appropriate, including new specialisations and/or majors in healthy ageing and/or geriatrics, sport management, sport psychology and coaching, a minor in food technology/science, and a joint major in nutrition and food science.
- Review the diploma, Bachelor and postgraduate programmes in Māori and indigenous health.
- Increase the numbers and improve the integration of clinical and professional colleagues into our professional degree programmes (nursing, public health, social work, nutrition and dietetics).
- Create practice and consultation centres as student learning platforms.
- Establish more institutional-level agreements with partners for co-operative placements, practicums, internships and other experiential learning opportunities.
- Explore the implementation of an alternative Doctoral training model in which students complete common methods papers, undertake a comprehensive exam, and undertake a research thesis. Such an approach would ensure Doctoral candidates are exposed to an array of methodological procedures, have demonstrated competencies in core areas relevant to their specialisations, and can independently undertake high-quality and innovative research.
- Help to maintain quality assurance and facilitate the recruitment of top students from New Zealand and around the world by encouraging more schools and programmes to seek accreditation from leading, highly recognised bodies and professional organisations in Australasia, Europe and the Americas.



Around 15,000 New Zealanders suffer from inflammatory bowel disease, with ulcerative colitis (which affects the large colon) and Crohn's disease (which can affect any part of the intestinal system) the most common conditions. As yet, there is no known cure, but with the help of drugs these conditions can often be kept in check before they flare up. But how do you assess whether a flare-up is imminent? Colonoscopies are awkward. X-rays are cumulatively hazardous. But there is a third method, a simple urine test that measures the permeability of the gut to indigestible sugars. Work by postgraduate student **Ivana Sequeira** (pictured) and the staff of Massey's digesta group into the fundamental science behind the test has shown that it has far more diagnostic potential than previously thought. The group's work on the absorption of sugars could have implications for the 225,000-and-counting New Zealanders who suffer from diabetes and the million-plus who are obese.



## Lifting our research impact



One of life's certainties is that we are all getting older. Today, around 27,000 New Zealanders are aged 90 or above; by the 2030s the count is expected to exceed 50,000. How do we ensure that we and our fellow citizens live healthy and fulfilling lives until well into old age? The question first captured the attention of Massey's **Associate Head of Nursing and Director of Postgraduate Nursing Programmes Dr Stephen Neville** when he entered the workforce as a hospital-trained registered nurse in the 1980s and, as he studied for his Masters and Doctoral degrees and moved into academia, it remained a preoccupation. Today, Neville is, among other things, President of the New Zealand Association of Gerontology.

Often, he says, the over-85s are depicted as frail, dependent and cognitively impaired. "My imperative is to constantly challenge those notions and promote a strength-based understanding of older people. That's why I am interested in people who live within communities, making sure that these are good places for them. This is about more than physical health. It is about seeing them as whole people within the context of their families and the community."

Neville has conducted surveys of loneliness among community-dwelling older adults aged 65 years and over (8 per cent were severely lonely and 44 per cent moderately so), and is just about to publish a study of factors that allow people over the age of 95 to live in their own homes.

He is also interested in how sexual minority groups experience ageing. "We conducted a big nationwide study of LGBT [lesbian, gay, bisexual and transgender] people, surveying them about their retirement intentions. Most identified that they wanted to live in LGBT-friendly residential facilities if they needed care, but their preference was to age in place in their own homes. We also found that our respondents experienced healthcare environments as heterosexist, ageist and homophobic." One practical outcome has been the development of a staff development tool for residential care facilities, ensuring that older LGBT people receive appropriate care.

- Focus on solving the big problems in health – on solution-oriented research.
- Increase collaboration across disciplines, schools, centres, colleges, institutions and countries.
- Establish new multidisciplinary research teams and centres within the college.
- Establish additional institutional agreements with external partners in public, private and not-for-profit sectors.
- Encourage entrepreneurship and enterprise among staff and students.
- Explore the use of paid postgraduate teaching and research assistantships for the purpose of supporting students, helping academic staff to protect more time for research, and providing students with pedagogically sound experiential learning opportunities.
- Enhance the role and importance of health in food product development, production, distribution and marketing, including playing a more prominent role in strategic Massey initiatives such as FoodHQ, agri-business and food safety.
- Increase the level of collaboration with colleagues – such as those in the One Health initiative and in infectious disease epidemiology – who have cross-over interests in animal and human health.
- Explore the creation of a new research cluster and international collaboration in interventional microbiology (the micro-biome).
- Expand our expertise in food governance.



Where you live plays a large part in determining how you live according to **Professor Karen Witten**, whose research interests centre on the interactions between the physical characteristics of neighbourhoods and cities and the social relationships, health and sustainability-related practices of the people living in them. "Suburbs with a purely residential function – few shops, parks, community services and usually poor public transport connections – promote physical inactivity because people have to drive to get anywhere," she explains. This especially matters for children, who often rely on their parents for transport and supervision. Witten's work has many implications for the way we structure our towns and cities.





## Social policy and ageing well

Dr Mary Breheny is working on identifying the factors that promote healthy ageing

Eat sensibly and exercise regularly: this is a popular prescription for good health, and fine as far as it goes. But senior lecturer Dr Mary Breheny takes a longer-term view. Breheny is part of the Health and Ageing Research Team, which, in 2006, began a longitudinal cohort study of New Zealanders aged 55 to 70. Eight years on, “we know quite a lot about our participants from the middle of their lives,” says Breheny, “but little about their lives before they joined the study”.

This life-trajectory information is crucial, says Breheny. “We know that early life experiences continue to influence people’s health as they age.”

Now a study called ‘Enabling Participation by all Older People’, funded by the Ministry of Business, Innovation and Employment, is going to fill the gaps.

“We’ll ask people to tell us about their earlier lives,” says Breheny. “Where did your family live when you were born?

What sort of work did your father do? Where did you go to school? How much education did you complete? What sort of work did you do? Tell us about your childhood health. Tell us about your adult health.”

Breheny will analyse the data, setting it in the context of New Zealand’s social policy history. Some things she expects to see. For example, education, independent of income, is associated with longevity. “So it is not just about education improving income, there is an independent association between education and longevity.”

The key value of a longitudinal study is establishing causation. “A longitudinal study allows us to say which things had effects years later. We will be able to identify what life events make the difference and understand how to disrupt the trajectory from disadvantage to poor health.”

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Young people on the verge of adulthood can be very vulnerable; even more so those who face risks from their environment or mental health issues. Massey University Professors **Robyn Munford** and **Jackie Sanders** (pictured) from the School of Social Work are leading a project to look at what this group's experience has been with services available to help them, with a view to identifying best-practice strategies to help them cope with difficult experiences.



**Zac Kim** is a social worker at the Open Home Foundation in Auckland, working in the community supporting families and caring for children, "making lives better one at a time".

## Enhancing our connections and partnerships

- Establish more institutional research agreements with external partners in public, private and not-for-profit sectors.
- Explore ways to enhance the role and importance of health in food product development, production, distribution and marketing, including a more prominent role in strategic Massey initiatives such as FoodHQ, agri-business, and food safety.
- Increase the level of collaboration with colleagues – such as those in the One Health initiative and in infectious disease epidemiology – who have cross-over interests in animal and human health.
- Create joint academic and research programmes with world-class universities in New Zealand and around the world.

## Expanding our global awareness and reach

- Revise and update the curriculum to embed global and international perspectives and issues.
- Improve college awareness of and sensitivity towards the needs and perspectives of international students.
- Expand partnerships with international agencies, universities and governments. For example, explore the feasibility of helping to train nurses, social workers, dietitians and public health and other professionals in Pacific Island nations, in Africa, with indigenous populations, and elsewhere.
- Increase international recruitment efforts, including reaching out to academic staff in other nations to upgrade their skills and complete Doctoral degrees.
- Encourage staff to seek international research and academic partners and funders related to our signature platforms.
- Explore the creation of a School of International and Global Health.
- Develop new programmes, majors and minors in international and global health.
- Explore the creation of joint degrees, joint majors and joint papers with other leading international universities.

## Benefiting our community, country and planet

- Create professional practice centres.
- Host think tanks and policy forums.
- Build engagement with secondary schools.
- Enhance staff engagement with professional, community and other service organisations.
- Improve connections with and between our alumni.

## Growing and diversifying our income

- Increase funding from international agencies and partners.
- Grow domestic enrolments.
- Increase international student enrolments.
- Increase postgraduate enrolments.
- Add new degrees and majors.
- Improve our administrative and organisational efficiency.
- Increase our value and relevance to prospective partners in industry, government and the not-for-profit sector.



# Strategic plan

## Enhancing our culture of excellence

- Enhance the exchange and engagement of staff.
- Recognise and celebrate staff and student achievements.
- Improve our commitment to biculturalism as a treaty-based college.
- Enhance mentorship and induction processes for staff.
- Improve student experiences through innovative engagement, teaching, pastoral care and programmes relevant to 21st-century careers.
- Provide institutional leadership towards and advocate for ensuring that Massey is a health-promoting university.
- Provide institutional leadership for the adoption of a comprehensive Massey strategy for sport and active living.
- Improve our infrastructure.
- Build awareness of health and healthcare issues.
- Host policy think tanks and produce policy briefs related to significant health challenges.
- Sponsor special events and conferences.
- Enhance engagement with secondary schools.
- Enhance international networks and partnerships.

## Embedding the principles of Te Tiriti o Waitangi/the Treaty of Waitangi

The college is committed to the principles of the Treaty of Waitangi and to building culturally supportive partnerships to improve Māori health and wellbeing. The college will:

- Work towards educating all staff with respect to the principles of the treaty and how they may be applied through our teaching, research and service roles.
- Create systems, procedures and programmes that fit the student rather than making the student unilaterally fit our systems.
- Review college policies, procedures, partnership agreements, strategic plans, annual work plans, and programme and paper proposals to examine their implications and ensure consistency with the principles of the treaty.
- Facilitate culturally supportive partnerships.





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## An invitation to join us

The world is changing in unprecedented ways and at an accelerating speed, and this presents immense challenges for education, demanding that we be forward-thinking, flexible and fast moving. In this profile and strategic plan we have given you a glimpse of some of the College of Health's strengths and of the founding vision that will take us into the future.

Our teaching fosters the attributes the world most needs in the 21st century: critical thinking and the ability to solve problems, initiative and entrepreneurship, transformative leadership, curiosity and

imagination, agility and adaptability, resilience and global awareness.

Our graduates will move seamlessly into the workforce having acquired the knowledge, skills, confidence and credentials they need to succeed here in New Zealand and internationally.

To paraphrase educator and futurist Ian Jukes, we are preparing students for their future, not our past.

Our research and service will inspire, generate, and evaluate novel solutions to today's health challenges.

Our learning, research, practice and

service are activities undertaken *in* the world for the *benefit* of the world.

Our approach is built around meaningful exchanges and partnerships among people and organisations.

We invite students and graduates as well as academic, research, business, public and non-profit agencies from around the globe to work with us and to help us shape our future. Become part of a network of dedicated and talented leaders focused on improving health, health equity, and wellbeing.

We want to hear from you.



If you would like to find out more about the College of Health, contact:

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Or visit us online:

 [health.massey.ac.nz](http://health.massey.ac.nz)

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**A 21ST CENTURY COLLEGE OF HEALTH**  
**TE KURA HAUORA TANGATA**



*In the end, it's not the years in your life  
that count, it's the life in your years.*

**Abraham Lincoln**

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