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## International Spotlight

# Aging in New Zealand: Ka haere ki te ao pakeketanga

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## Abstract

Aotearoa-New Zealand is expecting the number of older adults to double in the next 20 years. Despite publicly funded health and welfare support for older citizens, the aging experience differs across ethnic groups. This creates opportunities and challenges for health and social services to deliver culturally safe and equitable care for all older New Zealanders. Longitudinal and large data sets are pivotal for characterizing the aging experience from birth to advanced age. The New Zealand research funding system responded to predicted demographic changes by increasing funding in order to inform and address key health and well-being issues for older people. In addition, government strategies and policies increasingly focus on social aspects of aging and health inequities and require researchers and organizations to be better connected to end-users. New Zealand needs to continue to fund research that identifies unique and courageous service delivery solutions that result in positive social, financial, psychological, and physical aging for older New Zealanders.

**Keywords:** Indigenous, Māori, Pacific, health and well-being, public policies

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Aotearoa-New Zealand is a nation of 4.9 million people located in the South Pacific Ocean. Māori, the Indigenous people of New Zealand, have a distinct culture that is protected, along with health and well-being, by New Zealand's founding document—the Treaty of Waitangi. Ground-breaking gerontology research in New Zealand includes Life and Living in Advanced Age Cohort Study (LiLACS NZ), the world's first longitudinal study that includes a significant Indigenous population aged 80 years and older; Indigenous health and well-being research; the Otago Exercise Programme, which is an evidence-based

strength and balance falls prevention program utilized around the world; and the Dunedin Multidisciplinary Health and Development Study, an internationally renowned birth cohort study with more than 95% retention at age 45. This article summarizes New Zealand's demographics and inequities in aging and health, the current funding environment, large data sets and tissue collections that can be accessed for health and well-being research, emerging issues, and research and social policies that are driving changes in gerontology research in New Zealand.

## Demographics and Health Inequities

People aged 65 and older currently constitute 15% of New Zealand's population, with just over half (53.4%) being women (Statistics New Zealand, 2019). Almost 80% of older New Zealanders identified with a religion. Christianity was the most prevalent (75.7%) religious affiliation, followed by Hinduism (11.2%), Buddhisms (9.2%), and Islam (3.6%; Statistics New Zealand, 2013a, 2013b). Like most Western countries, the number of older New Zealanders has almost doubled since 1998, increasing from 0.44 to 0.74 million people. Ongoing increases in life expectancy mean that the older population in New Zealand is predicted to double to 1.30 million in the next 20 years, and the 85+ age group is expected to double in the next 40 years.

Māori currently account for 15% of the total population. However, the Māori population age structure is relatively young, with only 5.8% of the population more than 65 years of age identifying as Māori compared with 82.9% European, 2.5% Pacific, 6.3% Asian, and 2.5% other (Statistics New Zealand, 2019). Higher fertility rates, lower life expectancy, and higher rates of premature mortality for Māori compared with non-Māori contribute to these differences (Statistics New Zealand, 2019). Life expectancy for Māori is 7 years shorter than non-Māori in New Zealand, and health statistics show Māori experience the worst health and well-being with greater disability compared with other ethnicities (Statistics New Zealand, 2019). Although life expectancy is increasing for all New Zealanders, Māori are predicted to have a reduced life span for the foreseeable future.

Māori health and well-being have always been rights protected by the Treaty of Waitangi signed in 1840. This right aligns with the United Nations adoption of the Declaration on the Rights of Indigenous Peoples in 2007, which states that Indigenous people have the right to identity, language, employment, health, education, and cultural expression. The World Health Organization has recognized that health care systems must address "inequities rooted in discrimination." Positive aging has been compromised for Māori through lifelong socioeconomic disadvantage, poorer education status, reduced quality of housing, fewer employment opportunities, racism, and increased exposure to the criminal justice system (Edwards, Theodore, Ratima, & Reddy, 2018). Colonization has involved, and continues to involve, significant trauma for Māori associated with the appropriation of Māori land, urbanization, socioeconomic deprivation, cultural subjugation, and loss of political power (Wirihana & Smith, 2014). Historical insult and contemporary experiences of colonization see Māori experiencing differential exposure to the determinants of health, differential access to and through health care services, and differential access to high-quality health care (Reid & Robson, 2007).

Health inequities have arisen from systemic racism. A Waitangi Tribunal, a forum for historical grievances to be raised and addressed (Boast, 2006), began in 2016 on the Health Services and Outcomes Inquiry into health inequities experienced by Māori. The Tribunal has found serious Treaty breaches by the Crown that require an increased commitment to redesign the health system to address persistent Māori health inequities to enable positive Māori aging (Chin et al., 2018). Over the next 20 years, higher birth rates that occurred between 1945 and 1975 and increased immigration from Pacific and Asian regions from the 1970s onward will contribute to an increasing rate of growth for older Māori, Pacific, and Asian populations (160%–240%) compared with the older European population (50%; Statistics New Zealand, 2019).

This challenge is heightened by a current lack of data on the prevalence of many older-aged conditions in Māori, Pacific, and Asian peoples (e.g., dementia). As a result, New Zealand lacks detailed information on the distribution and burden of older age disorders within these groups. This issue will only be exacerbated by the lack of complete, reliable, and robust data associated with the poorly conducted 2018 Census in New Zealand (Kukutai & Cormack, 2018). New Zealand needs to respond to these opportunities and challenges for health and social services to deliver culturally safe and equitable care for all older New Zealanders.

## Areas of Gerontology Research Strength

For many decades, New Zealand research priorities have been focused on the health and well-being of older adults. One area of research strength in New Zealand is longitudinal studies. Table 1 outlines five longitudinal studies, their locations, websites, and names of the director or principal investigator. Data from these longitudinal studies are not publicly available, but access may be granted by the director or principal investigator. These established data sets often have small numbers of Māori and Pacific participants, in part because of lower proportions of these ethnicities in some of the sampled regions when these cohorts were established, which limits their use for understanding Māori and Pacific experiences of aging in New Zealand. Exceptions are the LiLACS NZ, New Zealand Health, Work and Retirement Study and the Pacific Islands Families Study.

The ongoing Dunedin Multidisciplinary Health and Development Study (also known as the Dunedin Study) was founded by Dr. Phil Silva in the Dunedin School of Medicine at the University of Otago in 1972. The Dunedin Study has followed 1,037 babies born between April 1972 and March 1973 at Queen Mary Maternity Hospital in Dunedin and has just completed 45th-year assessments with the cohort (Poulton, Moffitt, & Silva, 2015). The study began with a psychological development and health behavior focus, but has broadened to include measures of physical and sensory function, and has produced more than 1,200 publications. Brain

**Table 1.** Longitudinal Aging Studies in New Zealand

Study	Location	Principal investigator
Dunedin Multidisciplinary Health & Development Study (1972–current) <a href="https://dunedinstudy.otago.ac.nz/">https://dunedinstudy.otago.ac.nz/</a>	Dunedin	Professor Richie Poulton (University of Otago)
Christchurch Health and Development Study (1977–current) <a href="https://www.otago.ac.nz/christchurch/research/healthdevelopment/index.html">https://www.otago.ac.nz/christchurch/research/healthdevelopment/index.html</a>	Christchurch	Professor Joseph Boden (University of Otago)
LiLACS NZ study (2010–current) <a href="https://www.fmhs.auckland.ac.nz/en/faculty/lilacs.html">https://www.fmhs.auckland.ac.nz/en/faculty/lilacs.html</a>	Auckland	Professor Ngaire Kerse (University of Auckland)
New Zealand Health, Work and Retirement Study (2006–current) <a href="https://www.massey.ac.nz/massey/learning/departments/school-of-psychology/research/hart/new-zealand-health-work-and-retirement-study/new-zealand-health-work-and-retirement-study_home.cfm">https://www.massey.ac.nz/massey/learning/departments/school-of-psychology/research/hart/new-zealand-health-work-and-retirement-study/new-zealand-health-work-and-retirement-study_home.cfm</a>	Palmerston North	Professor Christine Stephens, Professor Fiona Alpass (Massey University)
Pacific Islands Families Study (2006–current) <a href="https://niphmhr.aut.ac.nz/research-centres/centre-for-pacific-health-and-development-research/pacific-islands-families-study">https://niphmhr.aut.ac.nz/research-centres/centre-for-pacific-health-and-development-research/pacific-islands-families-study</a>	Auckland	Associate Professor El-Shadan Tautolo (AUT University)

and body imaging were included in the most recent assessment. With the cohort now middle-aged, the study will significantly improve understanding of the lifelong determinants of health and well-being into older age. Retention of the living cohort at each assessment period averages 95%–97%, an incredible feat over almost half a century.

The Christchurch Health and Development Study began in 1977. During this time, they have followed the health, education, and life progress of 1,265 children born in the Christchurch urban region. The cohort has been studied from infancy, and was recently interviewed for their 40-year assessment, and has produced more than 500 publications. This study will also significantly contribute to knowledge about aging in New Zealand.

LiLACS NZ is a longitudinal study of New Zealanders living in advanced age. It aims to determine the predictors of successful advanced aging and understand the trajectories of advanced age health and well-being in Māori and non-Māori New Zealand populations. LiLACS NZ is the world's first longitudinal study of an Indigenous population aged 80 and older. Māori participants were aged 80–90 years, and non-Māori participants were more than 85 years of age when the research began in 2010. A strength of this research is that the number of Māori participants ( $n = 421$ ) is large enough to have equal explanatory power and that the findings will have the same precision as non-Māori ( $n = 516$ ). The research describes the health status of Māori and non-Māori in advanced age, explores factors that have affected older people's health and independence, how health and social services can better support older people and provide information on how to stay healthy, well, and independent as they get older [Dyall et al., 2014](#).

The New Zealand Health, Work and Retirement Study conducts research with people more than 55 years of age who live in New Zealand. The study began in 2006 and includes a biennial health and work survey, and links to national health data sets. In the nine waves of this longitudinal study completed to date (2006–2018), 48.3% ( $n = 5293$ ) of participants have been of Māori descent (Allen, Alpass, & Stephens, 2019). The study will provide information on issues such as health, work,

retirement, and housing, and provides New Zealand residents with the opportunity to share their experiences to help inform national and international discussions on these important issues.

The Pacific Islands Families Study is a longitudinal cohort study tracking the health and development of 1,398 Pacific children and their parents since the children were born at Middlemore Hospital in South Auckland in 2000. It is the only prospective study specifically of Pacific peoples in the world. The study aims to determine optimum pathways for Pacific children and families during critical developmental periods by identifying risk and resilience factors that influence positive and negative outcomes. This study makes strategic recommendations to improve the health and well-being of Pacific children and families and address social disparities in New Zealand. The study uses web-based surveys, telephone or face-to-face interviews where participants reside. Like the Dunedin Study, retention has been consistently high.

A longitudinal study that includes a larger proportion of Māori and Pacific peoples in the cohort is the Growing Up in New Zealand study, led by Professor Susan Morton at the University of Auckland's Centre for Longitudinal Research—He Ara ki Mua. This study will follow the development of 7,000 children from birth until 21 years of age—it has not been envisaged to examine adult or older adult experiences and so has not listed in [Table 1](#). However, ongoing support would be invaluable for a more well-rounded understanding of aging in New Zealand.

New Zealand also has research centers that conduct research focused primarily on older adults. These research centers have niche expertise, such as housing and environments, health, Māori health, culture and language, and workforce participation. [Table 2](#) details the names, locations, and areas of gerontology research center expertise. Some excellent research teams are not listed because they did not meet the criterion of having a gerontology-focused research center.

New Zealand has many researchers at the forefront of the Indigenous health field. The James Henare Centre conducts research across the life span, including with kaumātua (older

**Table 2.** Overview of Key Research Centers

Research center	Website and host	Main focus area(s)
Brain Research New Zealand	<a href="http://www.brnz.ac.nz">www.brnz.ac.nz</a> , University of Otago and University of Auckland	Biology of the aging brain
CARE: Collaboration of Ageing Research Excellence	<a href="https://www.otago.ac.nz/care">https://www.otago.ac.nz/care</a> University of Otago	Social health, frailty and sarcopenia, dementia, injury prevention, rural health, spirituality
Centre for Active Ageing	<a href="https://aca.auct.ac.nz">https://aca.auct.ac.nz</a> Auckland University of Technology	Diverse and inclusive communities, negotiating health issues, livable spaces and places, community and social life
Centre for Research, Evaluation & Social Assessment (CRESA)	<a href="https://cresa.co.nz">https://cresa.co.nz</a> Independent Research Centre in Wellington	Community resilience, housing tenure, aging in place
Health and Ageing Research Team	<a href="https://www.massey.ac.nz/hart">https://www.massey.ac.nz/hart</a> Massey University	Workforce participation, retirement, health as a research focus and housing
Institute of Healthy Ageing	<a href="https://www.waikatodhb.health.nz/centres-of-learning-and-research/institute-of-healthy-ageing">https://www.waikatodhb.health.nz/centres-of-learning-and-research/institute-of-healthy-ageing</a> Waikato District Health Board	Sharing research and clinical expertise, older people's health, and rehabilitation
James Henare Māori Research Centre	<a href="https://www.auckland.ac.nz/about/james-henare-maori-research-centre">https://www.auckland.ac.nz/about/james-henare-maori-research-centre</a> University of Auckland	Culture and language, employment, housing, standard of living and health, heritage threads connecting New Zealand and Polynesia
National Institute for Demographic and Economic Analysis	<a href="http://www.waikato.ac.nz/nidea/research/recent-publications">http://www.waikato.ac.nz/nidea/research/recent-publications</a> University of Waikato	Population research on demographic, social, and economic interactions
National Institute for Public Health and Mental Health Research: The Pacific Islands Families Study	<a href="https://niphmhr.aut.ac.nz/research-centres/centre-for-pacific-health-and-development-research/pacific-islands-families-study">https://niphmhr.aut.ac.nz/research-centres/centre-for-pacific-health-and-development-research/pacific-islands-families-study</a> Auckland University of Technology	Health and well-being of Pacific children, families and grandparents, and social disparities
The Family Centre and Family Centre Social Policy Research	<a href="http://www.familycentre.org.nz">http://www.familycentre.org.nz</a> Independent Research Centre in Wellington	Cultural and social policy research of Māori, Pacific Island, and European

Māori leaders; Wham et al., 2016), and there are additional research teams throughout the country (Table 2). New Zealand is also the birthplace of the Otago Exercise Program, which is an effective home-based falls prevention exercise program (Campbell & Robertson, 2003). The program has been widely disseminated in the United Kingdom, Europe, Canada, and United States (e.g., Shubert et al., 2018). It has also been adapted to a peer-led model (steady as you go, SAYGo), which has been successfully disseminated across New Zealand (Waters, Hale, Robertson, Hale, & Herbison, 2011).

### Models of Research Funding

The New Zealand Government invests approximately \$1.3 billion per annum on research funds across the science sector. In the past 5 years, the Government has directed more health research funding to address health inequities. In addition, Health Research Strategies require successful grant applicants to explain how the team will address health inequities within the research project. There is a concerted effort by research groups and centers to attract and train postgraduate scientists and clinicians in gerontology and geriatric fields. Also, national and international collaborations, which are essential in the National Science Challenge funding model described below, means that there

are strong relationships between researchers, stakeholders, communities, and policy makers.

The Ministry of Business, Innovation and Employment (MBIE) is the main funder of research in New Zealand (Ministry of Business, Innovation and Employment, 2019a). MBIE funds researchers directly through Endeavour, Catalyst, and Strategic Science Investments (Figure 1). MBIE also provides research money for distribution by other government agencies with narrow funding priorities, such as the Health Research Council, the Royal Society of New Zealand's Marsden Fund, Crown Research Institutes, and National Science Challenges. Additional research money is allocated by the Tertiary Education Commission, which funds the nine centers of research excellence and also the six-yearly performance-based research funding weighting to each university in New Zealand. Across these funding agencies, the majority of funding is allocated in contestable rounds. Funding across the New Zealand science sector can be investigator-initiated, mission-led, or user-led (Figure 1). Investigator-initiated is led by trained researchers. Mission-led involves researchers who cocreate, codevelop, and codeliver with stakeholders and end-users of the research. User-led research is primarily research developed by businesses to create new products and devices for markets. The

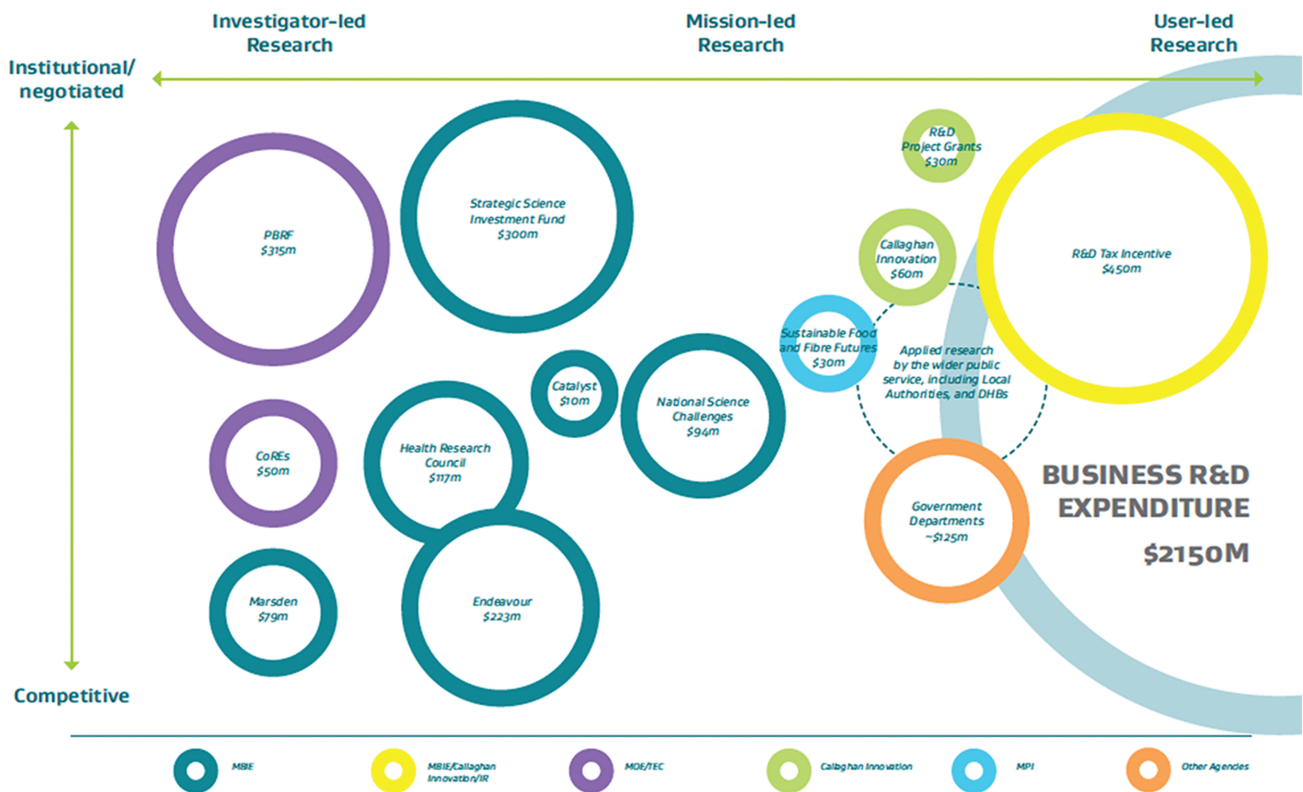


Figure 1. Model of research investment in New Zealand (Ministry of Business, Innovation and Employment, 2019a).

Government partially funds user-led research using R&D tax incentives. Health research can be funded by many but not all of these government agencies. For example, some of the Crown Research Institutes conduct research focused on forestry and biomaterials or climate and atmosphere. Health research is funded by other government (Lottery Health, Accident Compensation Corporation) and nongovernment organizations (e.g., Neurological Foundation of New Zealand) and numerous regional trusts. These organizations fund research of older persons, but that is not their primary focus.

In 2014, MBIE funded the Ageing Well National Science Challenge to increase gerontology research capacity and capability, and effectively address future needs associated with predicted demographic changes in New Zealand (New Zealand Gazette Office, 2014). Ageing Well is one of the three health-focused National Science Challenges, divided across the life span into A Better Start (young people), Healthier Lives (middle age), and Ageing Well (older people). There are also another eight mission-led National Science Challenges to “tackle the biggest science-based issues and opportunities facing New Zealand,” ranging from Biological Heritage to Resilience to Nature’s Challenges. The initial tranche of Ageing Well funding (2015–2019) focused on five interlinking research strands to reduce disability, increase social engagement, independence, and autonomy, create age-friendly environments, and value older people. The second tranche (2019–2024)

is funding larger programs of research focused broadly on Health and Wellbeing in Ageing, and Ageing and Māori (Ageing Well National Science Challenge, 2018).

### Data Sets and Tissue Collections

New Zealand has national health databases and tissue collections that cover the life span and can be used to understand the determinants of health and well-being into older age, or disease processes. Data are strategically valuable, and their use should be governed by the laws in the country where they were collected. Use and interpretation of Māori data are protected by the Treaty of Waitangi and the United Nations Declaration of the Rights of Indigenous Peoples to ensure Māori culture, traditional knowledge, and intellectual property are maintained and protected (Kukutai & Taylor, 2016). In addition, use of health data must benefit Māori health and well-being.

Integrated Data Infrastructure (IDI) is a large research database curated by the Government’s official data agency, Statistics New Zealand (Stats NZ). These data summarize life events, such as education, income, social support benefits, migration, justice, and health. Data come from government agencies, Stats NZ surveys, and nongovernment organizations. It contains matched, de-identified data on people and households, and the data are linked together, or integrated, to form the IDI. IDI is used to inform social policy decision making. Stats NZ receives new data regularly and updates

the IDI quarterly. Organizations may apply to Stats NZ to establish a “Data Lab” if they intend to use the IDI for a prolonged period of time. IDI contains health-related data for older New Zealanders.

However, IDI and other databases have unresolved issues related to Māori data sovereignty and governance. Who has access to the IDI and what the data are used for are critical, and determined by the Government Statistician at Stats NZ. Māori are overrepresented in the IDI. Researcher engagement must be transparent and of the highest ethical standards to ensure that Māori are not stigmatized by biased and racist interpretations of the data (Gulliver, Jonas, McIntosh, Fanslow, & Waayer, 2018). Data are used under “social license,” which is based on social values and trust. However, researchers have different standards depending on their understanding of Te Ao Māori (Māori world views) or their experience working with/for, and being answerable to, Māori communities. In addition, government-funded researchers are requested to include data in the IDI, but that can mean the context of the data set is lost, creating significant barriers for valid interpretation of the data (Gulliver et al., 2018). Māori governance over Māori data is essential to prevent misuse of the data and build Maori capacity and capability to analyze these complex data sets.

International Resident Assessment Instrument (InterRAI, <http://www.interrai.org>) is an international not-for-profit organization formed by a collaborative network of clinicians and researchers in more than 35 countries. InterRAI is governed by the InterRAI New Zealand Governance Board. Since it was established in July 2016, more than 120,000 InterRAI assessments were completed with 73,200 people aged 65 years and older in the first year. Now, more than 430,000 InterRAI assessments have been completed, with most conducted in aged residential care facilities. Five InterRAI assessments are used in New Zealand: long-term care in aged residential care facilities, home care, contact, community health, and palliative care in the home.

The New Zealand Health Survey (NZHS) is administered by Ministry of Health. The Ministry of Health is responsible for ensuring the health and disability service systems work for all New Zealanders. It is also the Government’s primary advisor on health policy and disability support services, improving health outcomes, reducing inequalities, and increasing public participation in services that facilitate positive health outcomes. It is an important data collection tool for monitoring New Zealand population health and well-being. The NZHS became a continuous survey in 2011, enabling annual publications on health status. NZHS reports provide a snapshot of the health of New Zealanders through key indicators on health behaviors, health status, and access to health care (Ministry of Health, 2019). Other data sets within the NZHS include the National Minimum Dataset (hospital events), National Non-Admitted Patient Collection, Programme for the Integration of Mental Health Data, and the pharmaceutical information database.

As some longitudinal studies have evolved to include tissue samples and scans (e.g., Dunedin Multidisciplinary Health and Development Study), other tissue collections have developed in New Zealand. The Neurological Foundation Human Brain Bank started in 1993 and collects brains donated mostly from older New Zealanders, plus the clinical history and information shared by the family. Brain tissue from neurosurgical procedures has been collected by the Hugh Green Biobank since 2011. For more than 12 years, the Parkinson’s study has collected magnetic resonance imaging or positron emission tomography scans, clinical evaluations, eye movement tests, and neuropsychological assessments from 300 people living with Parkinson’s disease and 60 healthy older New Zealanders. Dementia Prevention Research Clinics have recently been established throughout New Zealand. Research to date has informed understanding brain mechanisms of neurological disorders. However, clinicians and scientists recognize that these resources need to inform a greater understanding of healthy brain aging.

## Public Policies and Emerging Issues

New Zealand has strong social welfare and public health systems to ensure the health and well-being of its citizens and permanent residents. The social welfare system was established with the ethos that all New Zealanders have a right to a basic standard of living and is funded by having graduated personal income tax rates for working New Zealanders. Superannuation, known as the NZ Super, is a pension for people more than 65 years of age that was established in 1898 and was means (income) tested until it became universal in 1938. NZ Super initially provided 80% of the income of the average married couple, but this has decreased to 66% (St John & Dale, 2019). Additional financial support was introduced in 2006 with the SuperGold Card, which gives older New Zealanders discounts and concessions, such as free public transport during nonpeak periods. Consistent with many Western countries, the age of eligibility and the level of support are periodically reviewed (St John & Dale, 2019). The NZ Super is reasonably flexible—older New Zealanders can leave the country for up to 6 months of the year, which helps Pacific peoples to stay connected with their family and communities. A voluntary national retirement scheme was introduced in 2007, where funds can be accessed over the age of 65 to supplement the NZ Super to permit a higher standard of living into older age.

The New Zealand health care system was established in 1938 as a universal tax-funded fully public system that has developed into dual public and private systems (Goodyear-Smith & Ashton, 2019). Public hospitals treat citizens and permanent residents free of charge and are administered by local district health boards that receive funding allocations from taxes (Ministry of Health, 2016). Long waiting lists resulted in a parallel private system being developed that

is funded by health insurance organizations and their members. In addition, New Zealand has a no-fault accident compensation scheme delivered by the Accident Compensation Corporation (ACC) that covers accidents, including medical accidents, for all people legally in New Zealand (including tourists). ACC is funded through general income taxes, levies on employers, and taxes on petrol and vehicle registration. The Pharmaceutical Management Agency negotiates best-value medicines with pharmaceutical companies, so New Zealanders pay a part-charge for subsidized medications. Despite these health system strengths, inequitable health care access and outcomes persist for Māori and minority groups. Future health systems need to update structures and resources to produce equitable outcomes, integrate patient-focused service delivery with current services, and strengthen prevention and early primary health care interventions (Goodyear-Smith & Ashton, 2019).

As the political landscape continues to evolve in New Zealand and influences research priorities, an influential research strategy in the health sector is the Ministry of Health's New Zealand Health Research Strategy 2017–2027 (Ministry of Health, 2017). The Health Research Strategy defines knowledge and infrastructure needs and addresses shortfalls, ensures that health research remains a high priority for government spending, ensures that there is balanced investment and that cross-government agencies have oversight and coordination responsibilities. The Health Research Strategy has been positively received, and the New Zealand Health Research Prioritization Framework was released in December 2019. One shortfall is that research focused on older New Zealanders is fragmented, and is only partially covered within other priorities, such as noncommunicable diseases. A significant risk is that the research on the health and well-being of older New Zealanders could fall between priorities, which may lead to uncoordinated, piece-meal health service delivery. The Better Later Life Strategy and the New Zealand Carers Strategy were launched in 2019 (Ministry of Social Development, 2019a, 2019b). These strategies have a stronger focus on the social aspects of aging and health inequities. The "Impact of Research" position paper presents a research impact framework that will help researchers and their organizations to meet social responsibilities to ensure research is more relevant and connected to end-users, and leads to positive societal, environmental, and economic changes (Ministry of Business, Innovation and Employment, 2019b).

Another area of interest is elder abuse and its prevalence world-wide (Pillemer, Burnes, Riffin, & Lachs, 2016). This is an emerging area of research in New Zealand. This "canary in the coal mine" is a metric of the value of older people by society. Older people are sometimes considered a burden; this view is held by about 20% of New Zealanders more than 18 years of age (Ministry of Social Development, 2016). The rate of retirement village occupation by older, primarily European New Zealanders has skyrocketed

in the last decade. For many, it reduces the "burden" on family members, and for others, it allows them to "lock and leave it" for holidays. However, retirement villages are expensive, ranging from over NZD \$300,000 for a one-bedroom unit to \$2.5 million for stand-alone villas in expensive regions. Preliminary findings from a recent study funded by Ageing Well found that New Zealand residents moving into retirement villages were older and frailer and that the aged residential care sector (nursing home level care) has dramatically changed since the Government's nationwide funding model was put in place more than 20 years ago (Connolly et al., under review). People are going into care at a later age, with multiple long-term conditions and disability-related dependencies that require specialized, around-the-clock care. In Māori, Pacific, and other cultures, older people are experts within the whānau (extended family members) and the source of cultural knowledge (Wood, 2018). The number of older Māori and Pacific living in retirement villages and aged residential care is disproportionately low—the majority of residents are of European descent (Census Statistics New Zealand, 2013). This disparity means Māori and Pacific needs are underestimated, and culturally appropriate services are limited and hard to access. Previously, whānau care was not recognized or supported financially by the government, producing inequities across ethnicities. For Māori, aging in place is critical—it means kaumātua (knowledgeable older leaders) are near places (mountains and rivers), kainga and marae (domiciled spaces) of significance (Durie, 1999). They are likely to be surrounded by whānau, resulting in the intergenerational transfer of cultural and language knowledge. Aging in place brings additional health and well-being benefits that are only beginning to be understood by gerontology researchers. Proposed changes to the New Zealand Carer Strategy will allow financial support and training for carers within the family, which will facilitate culturally appropriate and equitable care provision.

## Conclusion

New Zealand's health, socioeconomic, and justice systems recognize positive aging as a right for all older citizens, yet the aging experience differs markedly by ethnicity. Like most Western countries, the significant increase in the proportion of older New Zealanders in the next 20 years will bring new opportunities and challenges to meet the needs of this population. We shared New Zealand's policies, research strengths, data sets, and funding environment to facilitate discussion among international gerontology researchers, funding agencies, and policy writers with the vision that they may identify solutions to trial or avoid when addressing their country's challenges. New Zealand's longitudinal studies will increasingly identify the determinants and predictors of positive and negative aging. However, less will be known about the Māori and Pacific experience due to low numbers in the cohorts. Barriers

for Māori and other ethnic minorities to access care in the health system are readily acknowledged. Despite changes in policy, research, and health service priorities, it will take some time before those barriers are fully addressed, and ethnic minorities experience equitable aging, health, and well-being. Therefore, we must continue to advocate for changes to policies throughout health and well-being, socioeconomic, justice, and education sectors to address the roots of aging inequities. Once this is achieved, all older New Zealanders will receive culturally appropriate care in place, facilitating strengths-based positive aging.

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## Conflict of Interest

None reported.

## References

- Ageing Well National Science Challenge. (2018) Ageing well future strategy 2019–2024. Retrieved from <https://www.ageingwellchallenge.co.nz/strategic-documents/>
- Allen, J., Alpass, F. M., & Stephens, C. V. (2019) New Zealand Health, Work and Retirement Longitudinal Study. Encyclopedia of Gerontology and Population Aging. Cham: Springer International Publishing, 1-7.
- Boast, R. (2006) The Waitangi Tribunal and transitional justice. *Human Rights Research Journal*, 4, 1–13. Retrieved from [https://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps\\_pid=FL1235665](https://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=FL1235665)
- Campbell, A., & Robertson, M. (2003) *Otago Exercise Programme to prevent falls in older adults*. Wellington, New Zealand: New Zealand Government. Retrieved from [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwiiszLhMboAhXwwTgGHAD\\_BaAQFjABegQIBBAB&url=https%3A%2F%2Fwww.livestronger.org.nz%2Fassets%2Fuploads%2Facc1162-otago-exercise-manual.pdf&usq=AOvVaw0bpB6fPzZFLI\\_bbdZlm8\\_m](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwiiszLhMboAhXwwTgGHAD_BaAQFjABegQIBBAB&url=https%3A%2F%2Fwww.livestronger.org.nz%2Fassets%2Fuploads%2Facc1162-otago-exercise-manual.pdf&usq=AOvVaw0bpB6fPzZFLI_bbdZlm8_m)
- Census Statistics New Zealand. (2013) *Living outside the norm: An analysis of people living in temporary and communal dwellings*. Wellington, New Zealand: New Zealand Government. Retrieved from <http://archive.stats.govt.nz/Census/2013-census/profile-and-summary-reports/outside-norm/residential-old.aspx>
- Chin, M. H., King, P. T., Jones, R. G., Jones, B., Ameratunga, S. N., Muramatsu, N., & Derrett, S. (2018). Lessons for achieving health equity comparing Aotearoa/New Zealand and the United States. *Health Policy (Amsterdam, Netherlands)*, 122, 837–853. doi:10.1016/j.healthpol.2018.05.001
- Connolly, M. J., Hikaka, J., Bloomfield, K., Broad, J., Wu, Z., Boyd, M.,...Bramley, D. (under review). Research in the retirement village community—Does the sample reflect the resident population? *BMC Medical Research*. doi:10.21203/rs.2.10585/v3
- Durie, M. (1999). Kaumātua tangata reciprocity: Māori elderly and whānau. *New Zealand Journal of Psychology*, 28, 102–106. Retrieved from <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwj4ZSkxsboAhW6yZgGHfgQBKIQFjABegQIAhAB&url=https%3A%2F%2Fwww.psychology.org.nz%2Fwp-content%2Fuploads%2FNZJP-Vol282-1999-6-Durie.pdf&usq=AOvVaw2u53Oc-BivQ-U3puUafg8r>
- Dyall, L., Kepa, M., Teh, R., Mules, R., Moyes, S.A., Wham, C.,... Kerse, N. (2014). Cultural and social factors and quality of life of Māori in advanced age. Te puawaitanga o nga tapuwae kia ora tonu—Life and living in advanced age: A cohort study in New Zealand (LiLACS NZ). *New Zealand Medical Journal*, 127(1393), 62–79. Retrieved from <http://journal.nzma.org.nz/journal/127-1393/6109/>
- Edwards, W., Theodore, R., Ratima, M., & Reddy, R. (2018). Māori positive ageing. *The New Zealand Medical Journal*, 131, 10–12. Retrieved from <https://www.nzma.org.nz/journal-articles/maori-positive-ageing>
- Goodyear-Smith, F., & Ashton, T. (2019). New Zealand Health System: Universalism struggles with persisting inequities. *Lancet (London, England)*, 394, 432–442. doi:10.1016/S0140-6736(19)31238-3
- Gulliver, P., Jonas, M., McIntosh, T., Fanslow, J., & Waayer, D. (2018). Surveys, social licence and the Integrated Data Infrastructure. *Aotearoa New Zealand Social Work*, 30, 57–71. doi:10.11157/anzswj-vol30iss3id481
- Kukutai, T., & Cormack, D. (2018). Census 2018 and implications for Māori. *New Zealand Population Review*, 44, 131–151. Retrieved from [https://population.org.nz/app/uploads/2019/02/NZPR-Vol-44\\_Kukutai-and-Cormack.pdf](https://population.org.nz/app/uploads/2019/02/NZPR-Vol-44_Kukutai-and-Cormack.pdf)
- Kukutai, T., & Taylor, J. (2016). *Indigenous data sovereignty. Toward an agenda*. Acton, Australia: ANU Press.
- Ministry of Business, Innovation and Employment. (2019a). *Draft New Zealand's research, science and innovation strategy*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.mbie.govt.nz/about/news/rsi-strategy-out-for-consultation/>
- Ministry of Business, Innovation and Employment. (2019b). *The impact of research: Position paper*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.mbie.govt.nz/about/news/working-together-to-demonstrate-the-impact-of-research/>
- Ministry of Health. (2016). *The structure of the New Zealand health and disability sector*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.health.govt.nz/system/files/documents/pages/structure-nz-health-disability-sector-oct16.pdf>
- Ministry of Health. (2017). *New Zealand Health Research Strategy 2017–2027*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.health.govt.nz/publication/new-zealand-health-research-strategy-2017–2027>



- Ministry of Health. (2019). *Older people's health data and stats*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/older-peoples-health-data-and-stats>
- Ministry of Social Development. (2016). *Attitudes towards ageing report*. Wellington, New Zealand: New Zealand Government. Retrieved from <http://www.superseniors.msd.govt.nz/documents/attitudes-towards-ageing-research/attitudes-toward-ageing-summary-report-2016.pdf>
- Ministry of Social Development. (2019a). *Better later life—He orange kaumatua 2019–2034*. Wellington, New Zealand: New Zealand Government. Retrieved from <http://superseniors.msd.govt.nz/about-superseniors/ageing-population/better-later-life-report/index.html>
- Ministry of Social Development. (2019b). *Carers' strategy action plan 2019–2023*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.msd.govt.nz/about-msd-and-our-work/work-programmes/policy-development/carers-strategy/>
- New Zealand Gazette Office. (2014, January 12, 30). *New Zealand Gazette*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://gazette.govt.nz/home/NoticeSearch?act=Criteria+for+proposals+for+National+Science+Challenges+fun+ding&soloRedirect=false>
- Pillemer, K., Burnes, D., Riffin, C., & Lachs, M. S. (2016). Elder abuse: Global situation, risk factors, and prevention strategies. *The Gerontologist*, 56(Suppl. 2), S194–S205. doi:10.1093/geront/gnw004
- Poulton, R., Moffitt, T. E., & Silva, P. A. (2015). The Dunedin Multidisciplinary Health and Development Study: Overview of the first 40 years, with an eye to the future. *Social Psychiatry and Psychiatric Epidemiology*, 50, 679–693. doi:10.1007/s00127-015-1048-8
- Reid, P., & Robson, B. (2007). *Understanding health inequities*. Wellington, New Zealand: Te Rōpū Rangahau Hauora a Eru Pōmare. Retrieved from <https://www.otago.ac.nz/wellington/otago067740.pdf>
- Shubert, T. E., Smith, M. L., Jiang, L., & Ory, M. G. (2018). Disseminating the Otago Exercise Program in the United States: Perceived and actual physical performance improvements from participants. *Journal of Applied Gerontology*, 37, 79–98. doi:10.1177/0733464816675422
- Statistics New Zealand. (2013a). *Culture and identity tables*. Wellington, New Zealand: New Zealand Government. Retrieved from [http://nzdotstat.stats.govt.nz/wbos/Index.aspx?\\_ga=2.256547400.2111628968.1581975713-1334707682.1563391933nz](http://nzdotstat.stats.govt.nz/wbos/Index.aspx?_ga=2.256547400.2111628968.1581975713-1334707682.1563391933nz)
- Statistics New Zealand. (2013b). *People aged 65+ living in New Zealand*. Wellington, New Zealand: New Zealand Government. Retrieved from <http://www.stats.govt.nz/infographics/people-aged-65-plus-living-in-new-zealand>
- Statistics New Zealand. (2019). *Population projection tables*. Wellington, New Zealand: New Zealand Government. Retrieved from <https://www.stats.govt.nz/>
- St John, S., & Dale, C. (2019). Intergenerational impacts: The sustainability of New Zealand Superannuation. Commissioned report prepared for the Commission for Financial Capability's 2019 Review of Retirement Income policies. Retrieved from <https://cdn.auckland.ac.nz/assets/business/about/our-research/research-institutes-and-centres/RPRC/OtherPapers/ToR%206%20FINAL%20St%20John%20and%20Dale%204%20Ocr%20revised.pdf>
- Waters, D. L., Hale, L. A., Robertson, L., Hale, B. A., & Herbison, P. (2011). Evaluation of a peer-led falls prevention program for older adults. *Archives of Physical Medicine and Rehabilitation*, 92, 1581–1586. doi:10.1016/j.apmr.2011.05.014
- Wham, C., Teh, R., Moyes, S. A., Rolleston, A., Muru-Lanning, M., Hayman, K.,...Kerse, N. (2016). Macronutrient intake in advanced age: Te puawaitanga o Nga Tapuwai kia ora tonu, Life and living in advanced age: A cohort study in New Zealand. *British Journal of Nutrition*, 116, 1103–1115. doi:10.1017/S0007114516003020
- Wirihana, R., & Smith, C. (2014). Historical trauma, healing and well-being in Māori communities. *MAI Journal*, 3, 197–210. Retrieved from <http://www.journal.mai.ac.nz/content/historical-trauma-healing-and-well-being-m%C4%81ori-communities>
- Wood, S. (2018). Understanding Maori and ageing—A literature review. Retrieved from <https://www.waipareira.com/wp-content/uploads/2018/07/Sarah-Wood.pdf>