



**BUSINESS SCHOOL**

**Retirement Policy and Research Centre**

## **Working Paper 2016-1**

# **Ageing and the Economics of Caring**

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## **The Retirement Policy and Research Centre**

The Retirement Policy and Research Centre is pleased to publish this Working Paper, '*Ageing and the economics of caring*', which builds on presentations by the Retirement Policy and Research Centre's Dr M.Claire Dale, and Associate Professor Susan St John, at the NZ Dementia Summit 5-6 November 2015, Te Papa, Wellington.

The profound demographic change occurring in New Zealand is also occurring in most of the rest of the world. The difference in New Zealand is that there is no public discussion or recognition of the issue. Nor is New Zealand participating in the World Health Organisation's Ageing Cities' collaborative research project.

Whether or not we are ready, the change has already begun. This paper explores some of the economic and social issues of our ageing population.

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Dr Susan St John  
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## Abstract

The ageing of the population has economic and social implications for the New Zealand care industry and for careworkers in particular. The ageing of the population is driven by the baby-boomer bulge, by markedly reduced fertility, and increased longevity, especially at older ages. A dramatic increase in the need for formal and informal care services is one outcome of this demographic change. Partly as a response to the long tradition of undervaluing and under-rewarding this gendered work, the supply of trained caregivers is unlikely to meet the growing demand. In addition, fiscal considerations, and the long tradition of carework as low paid and unpaid, will constrain the State's willingness to pay adequately for care services or to support unpaid care work.

## Introduction

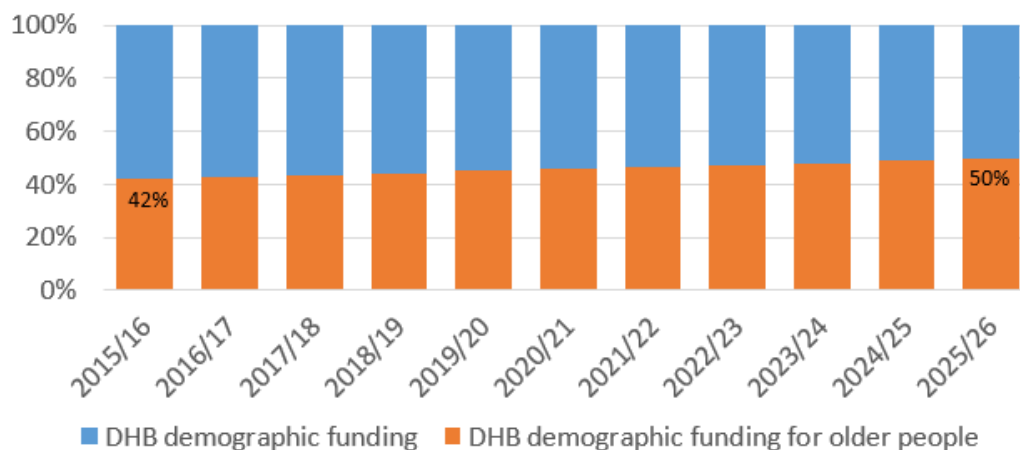
This paper explores the economic and social implications of the ageing of the population for the New Zealand care industry and for careworkers in particular. As with most Western countries, New Zealand's population mix is changing rapidly with increases in the group aged 65+ as the baby boom generation (born 1945-1965) enter retirement. In addition to the demographic bulge of the baby boomers, the ageing of the population is driven by markedly reduced fertility and increased longevity, especially at older ages. Improvements in life expectancy, principally caused by the reduction in childhood mortality during the first half of last century and improved health and medical care during the second half of the century, show no signs of abating.

One outcome of this enduring demographic change is that the need for formal and informal care services will increase dramatically. The supply of trained caregivers is on track to fall well short, in part as a response to the tradition of undervaluing this gendered work. On the demand side, the State's willingness to pay adequately for care services or to support unpaid care will be constrained by fiscal considerations, and by the long tradition of carework as low paid and unpaid.

The State's role in care services includes regulation around standards setting and quality control of premises, content of care, staff numbers and qualifications, regular monitoring, and service provision audits. Another State role is gatekeeping: allocation of services and resources with tight oversight for rehabilitation and care of disabled people, and for home care services for elderly (Posarac). Financing of care services is either private (including through insurance), public (direct, contracting out), or a combination of public and private, for example, direct financing of care providers who are increasingly private, for-profit organisations.

Ministry of Health data indicate that per capita health expenditure starts to increase exponentially around the age of 50, so that it is nearly twice the all-age average in the 65 to 69 age group and nearly eight times the all-age average in the 85 and over age group (NZIER 2004, p. ii). In 2012/13, those aged 65+ accounted for 33% of the Health budget (New Zealand Treasury 2013). By 2015/6, older people comprised 15% of the population and used 42% of health services (see Figure 1), and "Population ageing without health improvement will cause this share to increase" (Ministry of Health 2016). Since 2006, DHB spending on services for older people has increased by 68% versus a 27% increase in overall expenses (Ministry of Health 2016). Of the \$983 million DHBs spend on support services for older people, 60% goes to aged residential care, and the remainder to support in the home, support for carers, hospital-based rehabilitation and assessment, coordination and other services (Ministry of Health 2016).

**Figure 1. Share of health services used by people aged 65+ (Ministry of Health 2016)**



MoH estimate of future demographic-based funding for DHBs based on population growth

Under median projections and making no allowance for cost increases in this sector, the total costs for the aged of residential care, other services and support and New Zealand Superannuation (NZS), by 2017 will approach \$15 billion, and by 2022 it will reach almost \$17 billion (Dale 2014).

Economic policy informed by standard health economics severely undervalues care and caring. Mainstream economic evaluations and health economics tend to only count 'care' costs which can be easily measured, and provision by medical professionals. 'Care' is thus confined to a set of standardized instrumental or functional acts, while less tangible and measurable therapeutic and compassionate dimensions are not considered (Gott, Allen, Moeke-Maxwell, Gardiner and Robinson 2015).

'Care-giving' is also complicated by the mix of formal (paid, "professional") and informal (unpaid, "family") provision. Care-giving "is thus at once natural and socially constructed, and it is normatively laden" for example, for some, care is gendered, and women display more "natural caring" (Davis and McMaster 2013, p. 10). At the same time, 'care' needs to be recognised as a world-wide business with many interconnecting social and economic networks that are changing realities of millions of people in complex ways (Harcourt 2010).

Economic policy and public policy decisions are intertwined in determining a viable future for the emerging ageing society and the care industry. As stated in a recent Treasury paper:

*The ultimate purpose of public policy is to help people live better lives, now and into the future.... Once we specify the generation and protection of shared (across society and generations) and sustainable wellbeing as the main purpose of public policy, and we appreciate the multiplicity and complementarity of spheres of wellbeing, it becomes self-evident that we need to think of economic, social and environmental policies in an integrated way. (Karacaoglu 2015, p. ii)*

## Demographic change

A 2016 UK Government report on the future of their ageing population states:

*Without significant improvements in health, UK population ageing will increase the amount of ill-health and disability. Chronic conditions, multi-morbidities, and cognitive impairments will become more common. At the same time families will face increasing pressure to balance care with other responsibilities, particularly work. This is likely to mean that demand and supply of care will diverge, as the UK has more people needing*

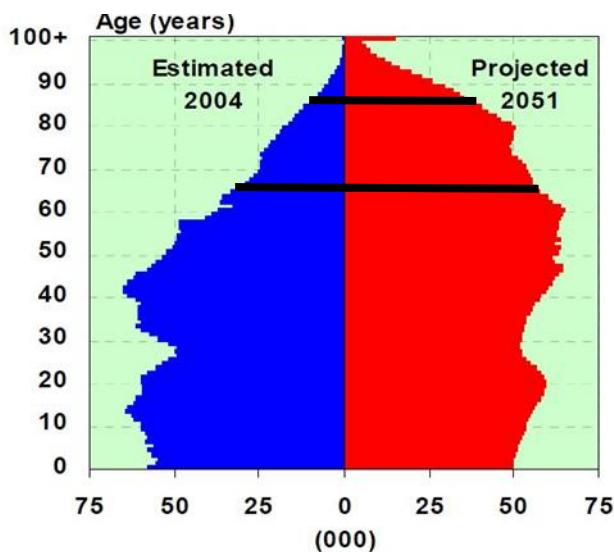
*physical and financial support, at a time when there are fewer people able to fund public services and provide care. Successfully meeting this demand will need adaptations to health and care systems and support for unpaid carers. (Government Office for Science UK 2016, p. 6)*

As in the UK, so too in New Zealand. The median age of New Zealand's population increased from 25.6 years in 1970 to 37.5 years in 2014, when 650,000 people aged 65+ comprised 14% of the total population. Statistics New Zealand's latest projections show that by 2039 the numbers aged 65+ will double to around 1.3 million (22-25% of the population); but the largest growth will occur between 2011 and 2037 as the baby boomers move into that age group (Statistics New Zealand 2014).

In 1950, New Zealanders reaching age 65 lived, on average, another 14 years. Those reaching age 65 in 2013 can expect to live, on average, another 22 years (Statistics New Zealand 2013b, p. 10). Based on the 2006 census and median mortality assumptions, the population aged 85+ is expected to increase from 73,400 in 2011 to 94,680 by 2022 (Health Partners Consulting Group 2013). By 2061, about one in four people over aged 65 will be 85+, compared with one in eight in 2012 (Statistics New Zealand 2014).

As the older 'old' population ages, a much higher proportion will be more likely to need care and support, including residential and hospital care. Figure 2 shows the growth in numbers aged 90+ including a significant number aged 100+, and the increasingly top-heavy age distribution of the population. The areas, blue (2004) to red (2051), above the black lines set at ages 65 and 85, illustrate the expected changes.

**Figure 2. Age structure 2014-2051** (Statistics New Zealand 2014)

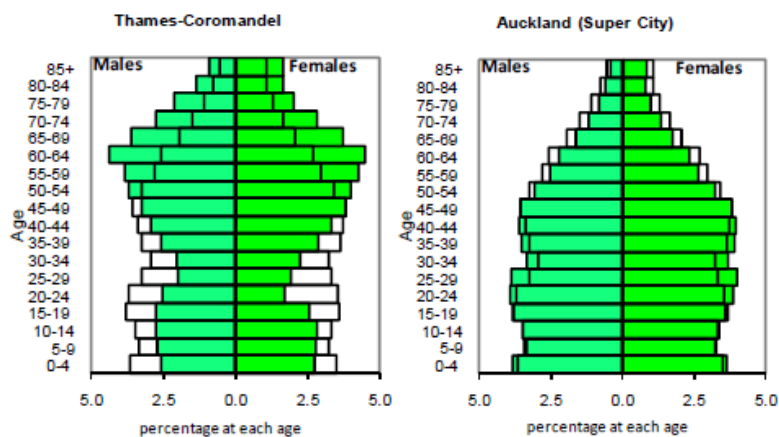


Although the vast majority of New Zealanders aged 65+ live independently, the requirement for long term care to assist with declining health (particularly mental health and dementia) rises sharply for those living past 85 years of age (Ministry of Health 2015). The incidence of dementia is of particular concern given increases in longevity: incidence doubles with every 6.3 year increase in age, from 3.9 per 1000 person-years at age 60-64 to 104.8 per 1000 person years at age 90+ (Prince, Wimo, Guerchet, Ali, Wu and Prina 2015).

In part, the Government's 'positive ageing strategy' (Ministry of Social Development 2011) is designed to address the transformation in New Zealand's demographics resulting in increased dependency levels. Two strands of the policy are 'healthy ageing' and 'ageing in place', both designed in part to keep the elderly out of expensive long-term hospital care, hence reducing costs of care and support. In response to the strategy, data shows a decrease over time in the age adjusted population proportion of rest home care and a corresponding increase in home support services whilst the proportion in hospital level care has stayed relatively steady (Boyd, Broad, Kerse, Foster, von Randow, Lay-Yee, Chelimo, Whitehead and Connolly 2011).

Complexity to demographic change is also added by the uneven geographical distribution of the aged population. For example, while Auckland arguably has the best facilities and support for aged care, it has the lowest regional proportion of superannuitants at 10.5% compared to the New Zealand average of 13.9% (Jackson 2012, p. 28). More dramatically, as shown in Figure 3, in Territorial Authorities like Thames-Coromandel, in 2011, immigration of older retirees is adding to both increased numbers and proportions at older ages, resulting in fewer than 6 people at labour market entry age (15-24 years) for every 10 in the retirement zone (55-64 years), compared with 13.2 for every 10 at national level (Jackson 2011, p. 14).

**Figure 3. Age-Sex Structure, Selected New Zealand Territorial Authorities, 2010**  
(Source: Jackson 2011, p. 15)



District Health Boards (DHBs) are funded per head of population. DHBs are particularly challenged by shrinking, ageing populations. Like Thames-Coromandel, Taranaki's population is barely growing, but by 2043 it is estimated the number of people aged over 65 will grow by nearly 70% to more than a quarter of the region's population (Harvey 2015). Apart from the fact that the older a person gets, the more likely they are to end up in hospital, funding to DHBs also covers the provision of in-home care.

The increase in dependency levels and consequent increase in both in-home and residential care has impacted formal and informal careworkers significantly (Boyd, Broad et al. 2011; New Zealand Home Health Association 2011). The demand for careworkers has increased, and the range of care services required has extended.

### Ageing and physical health

The ageing population partially explains the increase in the number of people living with a disability: from 20% of New Zealanders in 2001 to 24% in 2013 (Ministry of Health 2015, p. 4). While New Zealanders are living longer and independent life expectancy has

increased, independent life expectancy has not kept pace with the increase in life expectancy: around a fifth of a lifetime is spent in poor health:

*In 2013, New Zealand males could expect to live 82% of their life in good health, compared with 86% in 1996. New Zealand females in 2013 could expect to live 80% of their life in good health, compared with 83% in 1996. (Ministry of Health 2015, p. 4)*

Not all populations in New Zealand are ageing. The Māori population has a median age of less than 23 years, compared with the Pakeha population's median age of 38 years (Jackson 2011, pp. 17-8). However, Māori over the age of 50 have poorer health outcomes and a higher burden of chronic illness than non-Māori of the same age, although their use of care facilities is lower than for the population overall (Central Region District Health Boards 2011, p. 12). In addition, a regional health report found "25.1% of Māori aged 50 years or above lived in the most deprived areas by comparison to 6.6% for non-Māori" (Central Region District Health Boards 2011, p. 12).

There are also clear socioeconomic disparities in the health of older people. "Adults living in the most socioeconomically deprived areas are more than twice as likely to be physically inactive compared with those living in the least deprived areas." (Ministry of Health 2015) There may be a relationship between those areas of high deprivation and the lack of available in-home assistance. Although New Zealand legislation provides for in-home support for those aged 65+ who need assistance but not 24-hour nursing/medical services (Connolly, Broad, Boyd, Kerse and Gott 2013), careworkers are not always available to provide such support, and those needing care may not be aware that state-funded help is available.

As people age and become increasingly frail, it is often a loss of confidence that deters them from engaging in physical activity. If there is no paid or unpaid careworker to accompany them, they are more likely to sit than to walk. Physical activity helps protect against heart disease, stroke, type 2 diabetes, certain cancers, osteoarthritis and depression, and is also important for maintaining a healthy weight. Nearly 5% of health loss is accounted for by low physical activity (Ministry of Health 2015). Not surprisingly, physical inactivity is highest in those aged 75 years plus.

Excess weight is a leading contributor to health conditions such as type 2 diabetes, cardiovascular diseases, some common types of cancer, osteoarthritis, gout, sleep apnoea, gallstones, and mental health conditions especially depression. Adults living in the most socioeconomically deprived areas are four times as likely to be extremely obese as those living in the least deprived areas (Ministry of Health 2015).

The majority of people aged 65 years and older have at least one long-term condition (72%), with the most common disease patterns being arthritis, chronic pain and anxiety/depressive disorder (2.2%), and coronary heart disease (2%) (Ministry of Health 2015, p. 26).

Much health loss is due to behaviours and risk factors that affect health, including smoking, excess alcohol intake, not maintaining a healthy weight, poor nutrition and physical inactivity. Some of this health loss is not preventable, however leading a healthy lifestyle can reduce the risk of future ill health (Ministry of Health 2015, p. 8)

### **Ageing and cognitive health**

Until the recent past, research was divided on whether physical and cognitive functioning was improving among the aged population (Matthews, Arthur, Barnes, Bond, Jagger, Robinson, Brayne and on behalf of the Medical Research Council Cognitive Function and



Ageing Collaboration 2013) or declining (Statistics New Zealand 2014a). However, as noted above, the Ministry of Health in 2015 is no longer debating the issue: independent life expectancy has not kept pace with the increase in life expectancy. While New Zealand females have a higher life expectancy than males, they spend more of their life in poor health: in 2013 females required assistance for 16.7 years of their life, compared with 14.3 years for males (Ministry of Health 2015).

With increasing age, the incidence of dementia increases exponentially, doubling with every 6.3 year increase in age, from 3.9 per 1000 person-years at age 60-64 to 104.8 per 1000 person-years at age 90+ (Prince et al 2015, p.2). The Ministry of Health (2012b, p. 2) estimates approximately 48,000 dementia sufferers in New Zealand currently, of whom nearly 3,000 are in dementia units, nearly 1,000 in psycho-geriatric units, 10,000 in long-stay hospital care, 17,000 in residential care and the remaining 17,000 are in the community being assisted by formal (paid) or informal (unpaid) careworkers.

*Dementia shortens the lives of those affected, but its greatest impact is on quality of life, both for individuals living with dementia, and for their family and carers (Prince et al 2015, p. 3).*

New Zealand's total direct and indirect financial cost of dementia in 2011 was estimated at \$954.8 million, including the costs of residential care, pharmaceuticals, and general practitioner visits, as well as productivity loss and the loss of healthy years of life (Ministry of Health 2013). By 2026, the number of people suffering from dementia is projected to increase by more than 60% to over 78,000 (Ministry of Health 2013). As the population with dementia grows, so too will the financial and social costs.

*The large and growing financial cost of dementia provides an imperative for policy action. It is already the second largest cause of disability for the over-70s and it costs \$645 billion per year globally, and ageing populations mean that these costs will grow. (OECD 2015)*

Ministry of Health Disability Support Services, DHBs and Accident Compensation Corporation (ACC) usually contract other professional organisations to provide home support services (thus: 'providers'). While half the aged population use residential care at some point (Broad, Ashton, Got, McLeod, Davis and Connolly 2015), in 2012, around 31,000 people were in long-term aged residential care: "17,000 in rest homes, 2,900 in dementia units, 10,500 in long-stay hospitals and 750 in psycho-geriatric facilities" (Ministry of Health 2012b, p. 2).

## **Aged care industry**

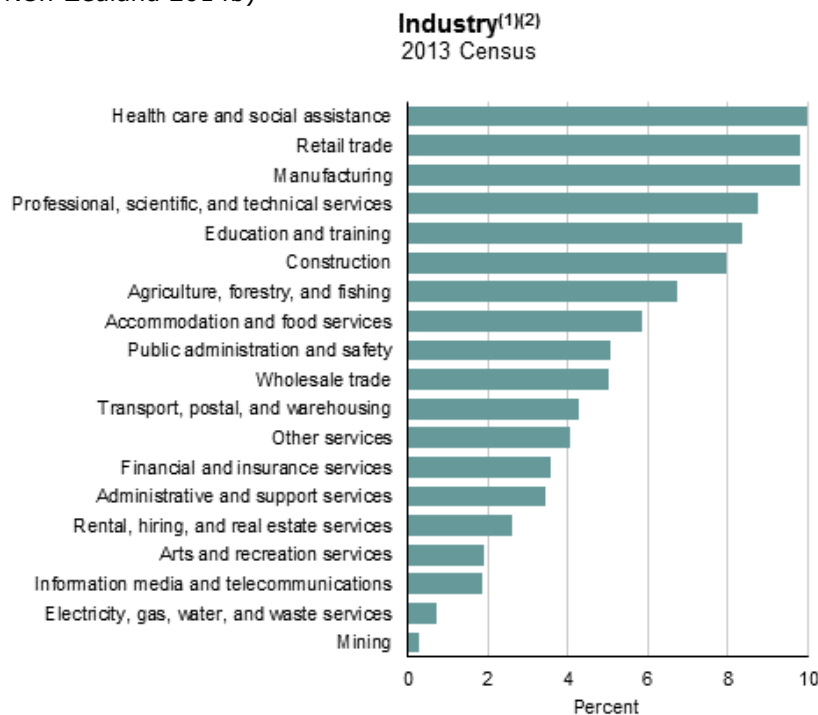
Care is a universal need, although it applies most particularly for the very young and the very old. In New Zealand, aged care preceded early childhood care in transforming from not-for-profit community-based services to primarily for-profit providers. This has led to some great gains, and some equally great losses. The gains include increased provision of care and improved access to care; and the losses range from reduced family and whanau involvement in care delivery to increasing institutionalisation of care.

Aged care work is becoming increasingly vital with ageing populations and the consequent growing burden of chronic disease, the pressures to reduce acute hospital stays, and the emphasis on remaining 'in home' as long as possible. This demographic change raises issues around health costs, including residential and in-home care and support, and regional and socio-economic variations in demand and supply of health supports for the

aged, including careworkers. Research suggests that increased access to state-funded assistance encourages the use of both formal and informal home care by elderly individuals who would not have otherwise used any type of home care (Tsai 2015).

Over recent years the health care and social assistance industry, which covers hospitals and medical care, residential care services, child care and other social services, has become the largest industry by employed numbers in New Zealand (Figure 4). This industry has expanded to employ one in ten workers or nearly 192,000 people, overtaking manufacturing as the most common industry (Statistics New Zealand 2014). These statistics do not take into account the thousands more unpaid careworkers who also contribute to social and economic well-being. Growth in the care and social assistance industry has been driven partly by Government policy promoting paid work over child-rearing for parents thus greater demands for child care, and partly by population ageing.

**Figure 4. Major industry groups for employed people aged 15 years and over** (Statistics New Zealand 2014b)



Despite this immense industry growth, and the major social and economic contribution of careworkers, the working lives and conditions of these careworkers and those who depend on them do not fit mainstream economic thinking. Significant attention may have been paid to the economic costs of health service provision for aged people, but little is known about the costs incurred by careworkers, whether formal or informal.

In New Zealand, as in much of the world, public policy for those who need support to remain in the community is largely dependent upon informal carers. Currently and for the foreseeable future, demographic change is driving an increase in the demand for both informal and formal care. To meet the needs of the projected number of disabled older people requiring a high level of support, the Department of Labour estimates that the number of paid careworkers needs to almost treble from just under 18,000 in 2006 to 48,200 in 2036: “the current pathway is not sustainable” (Ministry of Business Innovation & Employment 2009, p. 3).

As part of the ageing in place policy (and a cost-reduction policy), the age-adjusted population proportion in rest home care has decreased while the proportion in hospital level care has stayed steady. In Auckland, for example, absolute numbers in residential care beds have stayed roughly steady over 20 years, but with an increase in dependency levels (Boyd, Broad, Kerse, Foster, von Randow, Lay-Yee, Chelimo, Whitehead and Connolly 2011). As the use of rest home care has declined, the use of home support services has increased (New Zealand Home Health Association 2011). The increases in both dependency levels and demand for in-home care have impacted on careworkers.

The Ministry of Social Development (MSD) spent around 20% of its total social services expenditure in 2014/15 on contracted services. Social services are delivered by a mix of government, not-for-profit and for-profit providers, but as the Productivity Commission (2015, pp. 5 - 8) reported: the existing system is not well suited to deal with the multiple and inter-dependent problems experienced by the most disadvantaged individuals and families; the need for accountability and political risk management favours the use of prescriptive contracts, short contract periods and onerous reporting requirements, however, these factors work against innovation and discourage productive and trusting relationships between government agencies and non-government providers; and perhaps most critically for careworkers. The Productivity Commission (2015, pp. 5 - 8) reports: "government agencies quite often pay less than full cost when contracting providers to deliver the Government's goals and commitments. Such underpayment is unreasonable."

As of 2013, 81.7% of the workers in the health care and social assistance industry were women, of whom approximately 75% were aged over 40 years (Statistics New Zealand 2014; Ravenswood, Douglas and Teo 2015). Thus, the elder care work force itself is largely an ageing female population. Recent Census statistics (2014) also show that unpaid caregivers are twice as likely to be female rather than male, and typically older than the average New Zealand adult. Europeans and Maori have the highest propensity to undertake family (unpaid) care giving.

**Figure 5. Main tasks undertaken by community (non-residential) careworker survey participants** (Ravenswood, Douglas et al. 2015, p. 9)

Role	Percent
Personal care	74.1%
Home care/ domestic assistance	21.4%
Respite care	0.8%
Home maintenance/ modification	0.8%
Meal preparation/ delivery	0.4%
Other	2.6%
<b>Total</b>	<b>100%</b>

Care work is not a simple equation of either public, regulated, high or low paid work, or private, unregulated, unpaid work (Figure 5). It involves 'caring about' as well as 'caring for'; it has implications for the well-being of women and men performing and requiring care work (Harcourt 2010). Most home support service contracts are moving away from fixed tasks and hours to a more flexible approach, working with the client to maintain or

improve their independence.<sup>2</sup> "Care work is not easily compartmentalized into neat divides between emotional engagement and professional work." (Harcourt 2010, p. 4) The way care is organized is decisive for gender relations, equality and for collective well-being.

The Human Rights Commission's 2012 report, "Caring counts Tautiaki tika" recommended leadership of sector changes by the Prime Minister; pay parity between health care assistants working in DHBs and in-home and residential care careworkers; introduction of a fair travel policy; support for and access to qualifications for careworkers; and the instruction of compulsory safety standards to protect careworkers and the people they care for (Human Rights Commission 2012, p. 3). By mid-2014, some progress had been made on training, but pay parity and adequate staffing levels had not been achieved (Lawless 2014).

### **Formal (paid) aged-care workers**

The housework and care of persons that occurs in homes and communities is an area of economic research that has been largely carried out "under the assumption of rational individual choices which ignores the reality that care work is deeply gendered and based on profound gendered inequalities which place multiple work and care burdens specifically on women" (Harcourt 2010). The organisation of the provision of care, whether in the household, market, state or charity institutions, determines who can access care and who bears the burden of providing care. In particular, for unpaid care work, the studies show that, especially in poor households, it is mostly women and girls who provide it and thus have less time for education, paid work, leisure and civic engagement (Harcourt 2010).

Aged-care workers are also an ageing workforce, particularly those providing in-home care. The majority of in-home careworkers participating in a recent survey were clustered in the age range of 45 to 64 years old. Of the residential care survey respondents, 73.6% were aged over 40 years (Ravenswood, Douglas et al. 2015, p. 8).

The Department of Labour recognises the "current pathway" of underpayment to providers is not sustainable, as it will not encourage the near trebling of careworkers needed by 2036 to meet the needs of the projected number of older people requiring support (Ministry of Business Innovation & Employment 2009, p. 3). The Government's underpayment to care providers often manifests as low wages for careworkers. This is apparent in the 2014 New Zealand Aged Care Workforce Survey which found that "caregivers/senior caregivers who completed the survey earned less than \$19.00 per hour, with 37.7% receiving an hourly rate of less than \$15.00 per hour and the remaining 63 participants (59.4%) receiving between \$15.00 and \$19.00 per hour." (Ravenswood, Douglas et al. 2015)

Some consequences of these issues of low pay, increasing frailty of the clients, and increasingly heavy workloads are: lack of respect for and value of carework. Gendering the sector perpetuates the low wages of careworkers, and discounts the contribution they make to our communities. The majority of the careworkers are the main earner for their households (Ravenswood, Douglas et al. 2015), so this indicates a) that they and their families experience unjust hardship and b) clearly their low wages mean they are unable to save and prepare for their own retirement.

In addition, in-home careworkers must meet private costs such as car purchase and maintenance in order to keep their jobs. These are work relationships where the

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<sup>2</sup> See <http://www.health.govt.nz/your-health/services-and-support/health-care-services/services-older-people/support-services-older-people/what-you-can-expect-home-support-services>.

careworkers are contracted without guaranteed weekly hours. This is hard in the cities, but in rural areas with vast distances to cover, the conditions are worse and the costs to the careworker are higher. As a consequence of low wages, insecure income and large private costs, careworkers are at risk of resorting to high-interest debt, further compromising their ability to prepare for their future retirement.

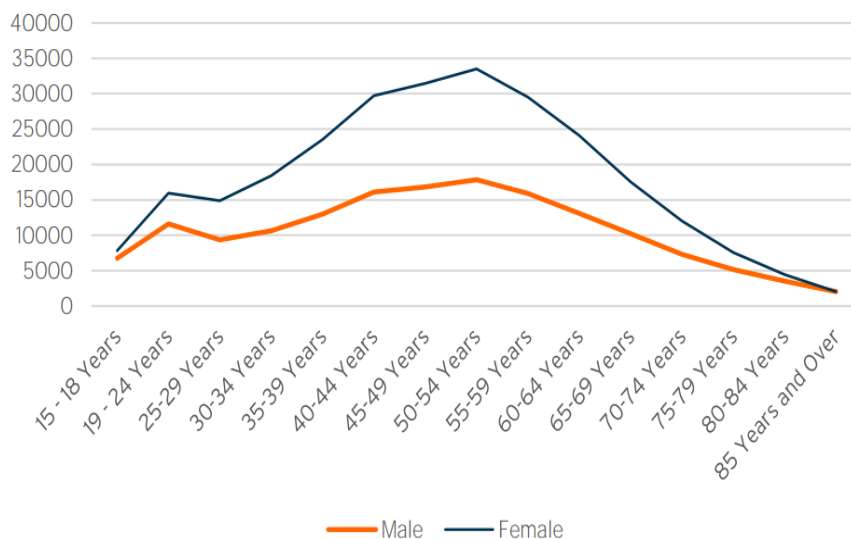
### Informal (unpaid) aged-care workers

A recent study of informal caregiving found that costs of caregiving were significant, reporting a range of direct (transport, food and medication) and indirect costs (related to employment, cultural needs and own health) (Gott, Allen et al. 2015). Costs operated at personal, interpersonal, sociocultural and structural levels.

Davis and McMaster (2013, p. 5) are among those who suggest that with unpaid, informal or family provision, “increasing caregiving activities have an increasingly adverse impact on the care provider’s welfare, including emotional stress and opportunity costs in time commitment”. Informal care is a significant substitute for formal long-term care, particularly elder care. Since formal care is more expensive whether publicly or privately funded, an important policy question is whether the supply of informal care will continue to meet demand. In their UK-based research, Carmichael, Charles and Hulme (2010) find that paid employment and higher earnings both reduce willingness to supply informal care. Similarly, research by Van Houtven, Coe and Skira (2013) finds most female informal in-home support caregivers are more likely to be retired, while those who are employed decrease work by 3–10 hours per week and face a 3% lower wage than non-caregivers.

As indicated above, the age profile of informal caregivers shown in Figure 6 replicates that of formal caregivers. Both workforces are ageing, suggesting a looming shortage of care providers to maintain the ageing in place policy.

**Figure 6. Age profile of Unpaid Carers in 2013** (Grimmond 2015)



The Time Use Survey 2009/10 indicates that on average an unpaid carer devotes 30 hours per work to caregiving. The value of this unpaid family care is estimated to lie in a range from \$7.3 billion (3.4% of GDP) to \$17.6 billion (8.1% GDP). Census data showed that in 2013, households of unpaid caregivers typically earned 10% less than households without caregiving responsibilities. These unpaid care workers faced this income penalty despite having a similar propensity to be in paid employment, to be qualified, and work in higher

skilled occupations. The fewer hours of paid employment appears to explain the lower incomes of informal careworkers (Grimmond 2014).

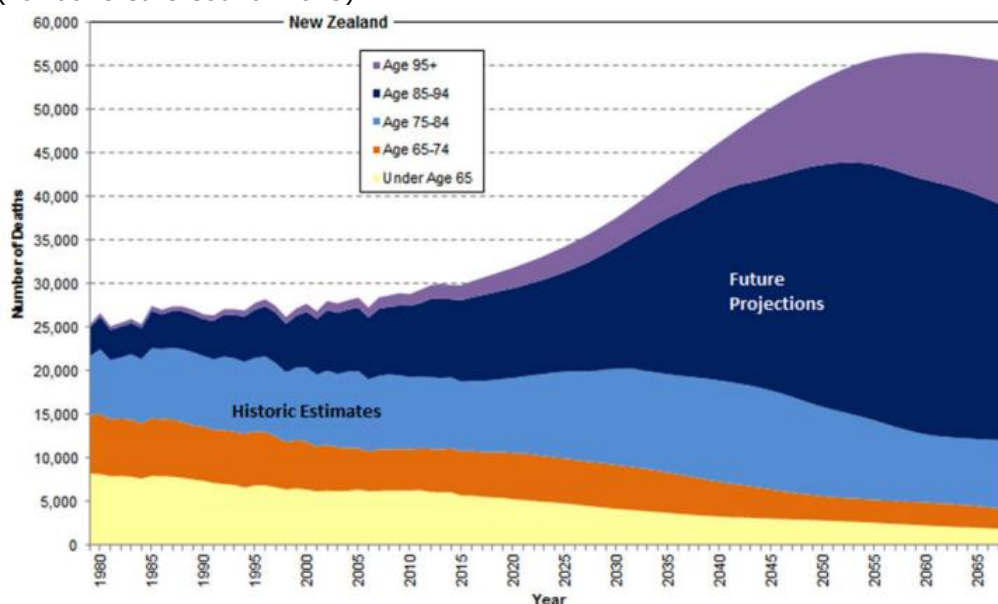
### Implications of future demands

These findings regarding the care industry and workforce reinforce the complexity involved in the design and funding of public long-term care programs. Given the potential trade-off between the supply of informal care and labour supply, governments may need to provide appropriate incentives to ensure the supply of care continues to meet an increasing demand. A decline in the supply of informal care has implications for health and social policy since it increases the demand for more expensive alternatives.

To meet the needs of the projected number of frail and disabled older people requiring a high level of support, the Ministry of Business Innovation and Employment (MBIE) estimate that the number of paid care workers needs to increase from just under 18,000 in 2006 to 48,200 in 2036 (Ministry of Business Innovation & Employment 2009). This is made more problematic by the changes to immigration policy around skills that have seen the number of registered nurses and healthcare assistants coming into the country annually reduced from 500 to 250 (Cree 2016).

As already noted, as the population ages there will be an increased demand for expensive long-term care, and the projected exponential increase in the incidence of dementia as the population ages is an added concern (Prince, Wimo et al. 2015). The projections of future deaths show that there will be more deaths at older ages (Figure 6), and most deaths over the age of 85 will occur in residential aged care facilities after an extended period of time (Palliative Care Council 2015). Between 2000 and 2010, 34.2% of elder deaths were in hospital, 30.7% were in residential care, with only 22.3% in a private residence. For those over the age of 85, 54.8% of all deaths were in residential care (Palliative Care Council 2015).

**Figure 7. Historic Deaths and Future Projections of Deaths in New Zealand by Age Band** (Palliative Care Council 2015)



In the updated projections of Deaths in New Zealand by the Palliative Care Council (PCC) of New Zealand, by 2068 a median projection estimates that 78.5% of all deaths will occur at age 85+. Critically, there will be substantially higher numbers of deaths with a much

older age profile compared to the deaths experienced today (see Figure 7). Palliative Care Australia identifies three characteristic causes of death:

*...in relation to the ages afflicted, with cancer peaking around age 65, fatal chronic organ system failure about a decade later [around age 75] and frailty and dementia afflicting those who live past their mid-eighties. (Palliative Care Australia 2010)*

The projected increased numbers of deaths at older ages indicate increased demand for resthome- and hospital-level care as the population ages. This in turn implies a concurrent increased demand for qualified careworkers.

In the 2013 Statement on New Zealand’s Long-term Fiscal Position “Affording Our Future”, Treasury projected future Government spending as a percentage of GDP based on policies as they existed in 2010. Given our current fiscal policies surrounding Healthcare and NZS (combined 11.1% in 2010), their share of GDP was expected to increase to 18.7% by 2060 (New Zealand Treasury 2013).

This increased fiscal pressure is largely a reflection of New Zealand’s rapidly changing demographics. For example, health spending in 2013 on those aged 65+ accounted for 33% of the total government health expenditure, despite that age group comprising only 13.9% of the total population (Bell and Rodway 2014). As shown in Figure 8 below, Treasury (2013) projected that:

*Government spending on healthcare will grow from 6.8% of GDP in 2010 to 10.8% in 2060 and spending on NZ Super is projected to grow from 4.3% of GDP in 2010 to 7.9% in 2060...*

**Figure 8. Fiscal projections 2010-2060** (Treasury, 2013)

% of nominal GDP	2010	2020	2030	2040	2050	2060
Healthcare	6.8	6.8	7.7	8.9	9.9	10.8
NZ Super	4.3	5.1	6.4	7.1	7.2	7.9
Education	6.1	5.3	5.2	5.2	5.1	5.2
Law and order	1.7	1.4	1.4	1.4	1.4	1.4
Welfare (excluding NZ Super)	6.7	4.8	4.4	4.2	4.0	3.8
Other	6.5	5.6	5.7	5.8	5.9	6.1
Debt-financing costs	1.2	1.8	2.5	4.2	7.1	11.7
<b>Total government expenses</b>	<b>33.4</b>	<b>30.8</b>	<b>33.4</b>	<b>36.9</b>	<b>40.6</b>	<b>46.8</b>
Tax revenue	26.5	28.9	29.0	29.0	29.0	29.0
Other revenue	3.2	3.0	3.2	3.2	3.3	3.6
<b>Total government revenue</b>	<b>29.7</b>	<b>31.9</b>	<b>32.2</b>	<b>32.2</b>	<b>32.3</b>	<b>32.6</b>
Expenses less revenue	3.6	-1.1	1.2	4.6	8.3	14.3
<b>Net government debt</b>	<b>13.9</b>	<b>27.4</b>	<b>37.1</b>	<b>67.2</b>	<b>118.9</b>	<b>198.3</b>

These considerable increases in health care and NZS expenditure over time come at the expense of other critical areas, in particular spending that affects the working age population such as education and welfare under current policy settings. The emerging social distress around child poverty, increasing inequality and unaffordable housing (Perry 2016) suggests that current fiscal policies are unsustainable, and may be increasingly seen as inter-generationally inequitable should the Government’s current fiscal policies remain unchanged.

However, policy change appears unlikely. Bill English, elected in December 2016 by National as the next Prime Minister after John Key resigned (Davison 2016), when acting Prime Minister in 2015 said that, thanks to New Zealand's small surplus, this country would not be following other nations and changing its national super rules.

*Here, the rules won't change . . . It is going up. This year it will cost \$700 million more than last year. Next year it will cost about \$700 million more again. That is because there are more people turning 65 . . . It is our biggest single investment cost each year, but no-one is arguing about it.* (stuff.co.nz 2015)

Remarkably, given the evidence and analysis supporting previous projections, in Treasury's most recent long-term fiscal projection, "He Tirohanga Mokopuna" (The Treasury 2016), healthcare costs in 2060 are reduced from 10.8% of GDP to 9.7%.

**Figure 9. "What if" projections of government expenses (% of GDP)** (The Treasury 2016, Table 1.1)

	2015	2030	2045	2060
Healthcare	6.2	6.8	8.3	9.7
New Zealand Superannuation (NZS)	4.8	6.3	7.2	7.9
Education	5.3	5.4	5.5	5.7
Law and order	1.5	1.4	1.4	1.4
Welfare (excluding NZS)	4.2	4.5	4.7	4.7
Other (excluding finance costs)	6.3	6.7	6.7	6.7

Note: 2015 are actual results. Projections are from the "Historical Spending Patterns" scenario in Section Six. These projections represent a "what if" scenario and are not a prediction for how expense areas will actually grow.

There is no explanation for the significant decrease in projected healthcare costs, and in fact, both the 2013 and 2016 long term fiscal models model "healthy ageing effects" (The Treasury 2016, p. 71). Also noteworthy, as shown in Figures 8 and 9, is the consistent projection of the cost of NZS at 7.9% of GDP, while the costs of Education (5.2% in 2013 to 5.7% in 2016) and Welfare (3.8% to 4.7%) both increase in the latest projections. The assumed policy changes underpinning the 2016 projections: in Education, spending growth rate increases from 3.9% per year to 4.1%; and non-NZS welfare payments are indexed to nominal GDP growth.

Treasury's projections of reduced costs in the future may be influenced by the possibilities in technology, which holds great promise as a contributor to in-home care for the elderly, in addition to advantages and advances in institutional settings. Stowe and Harding (2010) suggest separation into 3 categories: telecare, telehealth and telemedicine, with *Telecare* as the use of communications technology to provide health and social care directly to the user (patient). This excludes the exchange of information solely between professionals, generally for diagnosis or referral.

*Telehealth* equipment is used as a tool in the management of long-term conditions in the community to proactively monitor patients and respond promptly to indicators of acute exacerbations. 'Vital signs' monitoring is believed to reduce hospital admissions and uses equipment in patients' homes to identify trends and alert when preset parameters are breached. *Telemedicine* is 'healing at a distance'. The WHO definition of telemedicine (or e-health) is: the practice of medical care using interactive audiovisual and data communications, including delivery of care, diagnosis, consultation, treatment, health education and the transfer of medical data (Stowe and Harding 2010).



The incorporation of new technologies into the fields of health and social care is already a worldwide phenomenon. Users with cognitive impairment who are at risk of losing their autonomy may have the most to gain from devices designed to improve safety in the home, which may enable them to live independently (Stowe and Harding 2010).

There is another possibility for specialist care in purpose-built environments such as Hogeweyk, Netherland's self-contained Dementia Village,<sup>3</sup> which opened in 2009. The fact that a resident is handicapped by dementia does not exclude them from control over their day to day life and surroundings. The residents are able to move freely inside the house and outside where the village facilities include a restaurant, a bar and a theatre used by residents and the surrounding neighbourhoods. The model is currently being adapted in New Zealand by Whare Aroha CARE, where their Rotorua lakeside village, eventually catering for up to 200 residents, was expected to open by May 2017 (Malcolm 2014).

For those active and able retirees who own a property or other sufficient assets, there is the option of purchasing a 'licence to occupy' in a retirement village. Most villages have an on-site facility providing either resthome or hospital-level care, and all villages provide 24 hour access to trained staff in the event of an emergency. A recent survey of over 45s commissioned by Metlifecare found that just over two thirds of respondents would consider moving to a retirement village at some stage (Bath 2016). As shown in census data, the numbers of people reaching retirement age in possession of a mortgage-free house continue to diminish (Statistics New Zealand 2013), meaning the retirement village option becomes less accessible.

For active and able retirees without accumulated assets, Abbeyfield houses provide an alternative option. Charges vary, but the rents include main meals, and are less than NZS (including the living-alone allowance for single residents) plus a means-tested accommodation supplement. Managed by a local committee of volunteers and a residents' committee who meet regularly to solve any problems, each resident furnishes and cares for their own room and lives independently and as privately as they wish, although Abbeyfield houses also have a resident housekeeper to maintain the house and make the meals (Hale 2014).

For more than ten years, in most of the rest of the world, developing environments responsive to the aspirations of older people has been a major concern for social and public policy. To assist cities to become more "age-friendly" the World Health Organization (WHO) prepared the Global Age-Friendly Cities Guide in collaboration with partners in 35 cities from developed and developing countries. The features of age-friendly cities were determined across eight domains of urban life: outdoor spaces and buildings; transportation; housing; social participation; respect and social inclusion; civic participation and employment; communication and information; and community support and health services. Physical accessibility, service proximity, security, affordability, and inclusiveness were recognised everywhere as important characteristics (Plouffe and Kalache 2010). Policies and programs directed at achieving "age-friendly" communities require actions at the level of the social and physical environment. But there are barriers to the implementation of age-friendly policies (Buffel, McGarry, Phillipson, De Donder, Drury, De Witte and Smetcoren 2014), including issues of intergenerational equity, public acceptance, and cost.

Despite continuing improvements in health, healthcare-related technology and aged care environments, the profound political silence on national policies in preparation for the

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<sup>3</sup> See <http://hogeweyk.dementiavillage.com/en/>.

ageing population, and, as outlined in previous sections, the increasing costs of care provision and problems specific to paid and unpaid careworkers remain.

These problems extend far beyond looming shortages of careworkers for residential and in-home care of the ageing population. For example, given that the majority of careworkers are themselves a cohort rapidly approaching retirement, there is a common concern that they will not be sufficiently financially prepared for their own retirement. This risk arises fundamentally from the underpayment of paid care workers and the income penalty incurred by unpaid care workers. In addition, given the current underpayment and income penalties faced by paid and unpaid careworkers, it is unlikely they will be able to afford the future long term care costs that they will inevitably face.

To deal with this, perhaps the first step forward is to recognize and remedy the current stigmatization of care work as “women’s work” that requires little to no skill. This is clearly reflected in the prevailing remuneration of paid careworkers and the predominantly female composition of the industry.

To facilitate the increase the supply of care workers to meet future needs there must be a number of changes, including:

- A marked improvement to base wages
- A recognition of skills and service required for carework
- A deliberate strategy to raise the status of the work
- Compensation for private costs (e.g. cars and petrol)
- Access to training, support and counselling
- Career paths and opportunities.

Current policies such as KiwiSaver subsidies, Working for Families tax credits, Health Insurance, and Paid Parental Leave clearly reward ‘paid work’. However, we need to critically rethink and redefine what “work” really is – from an activity which only is done for money and gives an individual social inclusion, status and respect, to include and value aspects of work which care work captures. Without change to the way we approach fiscal policies in this area, New Zealand will struggle to find a sustainable solution to the impending increase in health and long term social assistance costs without sacrificing the well-being of future generations.

## Conclusion

In New Zealand, there is a determined silence about the ageing population, and thus there is little or no preparation underway. New Zealand is not participating in the World Health Organisation’s Ageing Cities’ collaborative research project, or any other advance planning, but whether or not we are ready, the changes will continue. It will also be necessary to recognise the different needs of the regions: urban and rural populations are ageing at different rates and have different needs. Promoting healthy ageing, and ageing in place policies are not a total solution.

The economic and social issues of our ageing population explored in this paper involve the New Zealand care industry and careworkers in particular. The need for formal and informal care services will increase dramatically in response to this enduring demographic change. Increased longevity means increased years of physical and cognitive disability, translating into an increased demand for formal and informal careworkers, Treasury’s 2016 projections of increasing health costs, although much reduced on the 2013 projections, are an indication of the fiscal pressures of the future.

Changes in technology and care environments will doubtless have a positive impact on the care industry. But there is another major problem. For many reasons, the supply of trained caregivers will fall well short. As well as the tradition of undervaluing and underpaying this gendered work, and the ageing of that workforce, 'care' is a world-wide business with a rapidly increasing client base: international competition for trained and competent careworkers will continue to increase. Both paid and unpaid careworkers will require greater economic and social recognition and support.

The challenges of an ageing population are clear and multiple. Pursuing the current policy of silence and inaction will not cause the challenges to disappear.

### **Bibliography:**

- Bath, B. (2016). Rest homes could provide answers to housing crisis, 11 December. Sunday Star Times. Auckland.
- Bell, M. and P. Rodway (2014). "Treasury's 2013 long-term fiscal statement: Assumptions and projections." New Zealand Economic Papers **48**(2): 139-152.
- Boyd, M., J. B. Broad, N. Kerse, S. Foster, M. von Randow, R. Lay-Yee, C. Chelimo, N. Whitehead and M. J. Connolly (2011). "Twenty-year trends in dependency in residential aged care in Auckland, New Zealand: a descriptive study." Journal of the American Medical Directors Association **12**(7): 535-540.
- Boyd, M., J. B. Broad, N. Kerse, S. Foster, M. von Randow, R. Lay-Yee, C. Chelimo, N. Whitehead and M. J. Connolly (2011). "Twenty-year trends in dependency in residential aged care in Auckland, New Zealand: a descriptive study." Journal of the American Medical Directors Association **12**(7): 535-540.
- Broad, J., T. Ashton, t. M. Got, H. McLeod, P. Davis and M. Connolly, J (2015). "Likelihood of residential aged care use in later life: a simple approach to estimation, with international comparison." Australian New Zealand Journal of Public Health.
- Buffel, T., P. McGarry, P. Phillipson, L. De Donder, S. Drury, N. De Witte and A. Smetcoren (2014). "Developing Age-Friendly Cities: Case Studies from Brussels and Manchester and Implications for Policy and Practice." Journal of Ageing and Social Policy **26**(1): 52 - 72.
- Carmichael, F., S. Charles and C. Hulme (2010). "Who will care? Employment participation and willingness to supply informal care." Journal of Health Economics **29**(1): 182 - 190.
- Central Region District Health Boards (2011). Supporting Older Māori & Pacific Peoples in the Central Region 2012, Regional Services Programme, Ministry of Health.
- Connolly, M., J, J. B. Broad, M. Boyd, N. Kerse and M. Gott (2013). "Residential aged care: The de facto hospice for New Zealand's older people." Australasian Journal on Ageing.
- Cree, B. (2016). Opinion: Current immigration policy is hindering NZ's aged care industry. INsite. **30 November**.
- Dale, M. C. (2014). Turning silver to gold: Policies for an ageing population (Revised 2015). RPRC Working Paper 2014-2. Auckland, Retirement Policy and Research Centre.
- Davis, J. and R. McMaster (2013). "Situating Care in Health Economics." Adam Smith Research Foundation Working Papers Series **2013:02**: 13.
- Davison, I. (2016). Bill English will be next Prime Minister, Judith Collins, Jonathan Coleman stand aside. New Zealand Herald. Auckland.
- Gott, M., R. Allen, T. Moeke-Maxwell, C. Gardiner and J. Robinson (2015). "'No matter what the cost': A qualitative study of the financial costs faced by family and whānau caregivers within a palliative care context " Palliative Medicine **29**(6): 518 - 528.

- Government Office for Science UK (2016). Future of an Ageing Population. Foresight projects and Future of ageing. UK, Government Office for Science, UK.
- Grimmond, D. (2014). The Economic Impacts and Value of Informal Care in New Zealand. For Carers NZ and the NZ Carers Alliance, Infometrics.
- Hale, B. (2014). The Abbeyfield Alternative, October. INsite Magazine. New Zealand.
- Harcourt, W. (2010). Rethinking the Economics of Care: Migrant Women's Work and the Global Care Chain. Work and Care, Society for International Development: 9.
- Harvey, H. (2015). Aging population puts pressure on health system. Taranaki Daily News. Taranaki.
- Health Partners Consulting Group (2013). Aged Care Demand Model (2012) Wellington, DHB Shared Health Services New Zealand.
- Human Rights Commission (2012). Caring counts Tautiaki tika. Wellington, Human Rights Commission.
- Jackson, N. (2011). The demographic forces shaping New Zealand's future. What population ageing [really] means. Waikato, The University of Waikato: National Institute of Demographic and Economic Analysis.
- Jackson, N. (2012). Auckland Region – Socio-Demographic Profile 1986-2031, National Institute of Demographic and Economic Analysis, The University of Waikato.
- Karacaoglu, G. (2015). The New Zealand Treasury's Living Standards Framework - Exploring a Stylised Model. New Zealand Treasury Working Paper 15/12. Wellington, New Zealand Treasury.
- Lawless, J. (2014). Update on the Caring Counts report recommendations, [nznoblog.org.nz](http://nznoblog.org.nz).
- Malcolm, R. (2014). New lakeside 'town' for Whare Aroha 13 December. Rotorua Daily Post. Rotorua.
- Matthews, F. E., A. Arthur, L. E. Barnes, J. Bond, C. Jagger, L. Robinson, C. Brayne and on behalf of the Medical Research Council Cognitive Function and Ageing Collaboration (2013). "A two-decade comparison of prevalence of dementia in individuals aged 65 years and older from three geographical areas of England: results of the Cognitive Function and Ageing Study I and II " Lancet.
- Ministry of Business Innovation & Employment (2009). Demographic Shift. The Future Demand for Paid caregivers in a Rapidly Ageing Society. Wellington, Department of Labour.
- Ministry of Health (2012b). Premium-only Aged Residential Care Facilities and Stand-down Provisions for Mixed Facilities: Discussion document. Wellington, Ministry of Health.
- Ministry of Health (2013). New Zealand Framework for Dementia Care. Wellington, Ministry of Health.
- Ministry of Health (2015). Health and Independence Report 2015. The Director-General of Health's Annual Report on the State of Public Health. Wellington, Ministry of Health.
- Ministry of Health (2016) DHB spending on services for older people. DOI: <http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/older-peoples-health-data-and-stats/dhb-spending-services-older-people>
- Ministry of Social Development (2011) Positive Ageing Goals and Key Actions. DOI: <http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/planning-strategy/positive-ageing/goals-and-actions.html>
- New Zealand Home Health Association (2011). Making the Most of Home Support Services. Wellington, The New Zealand Home Health Association Inc.
- New Zealand Productivity Commission (2015). More effective social services. Wellington, New Zealand Productivity Commission.
- New Zealand Treasury (2013). Affording our future; Statement on New Zealand's long-term fiscal position. July 2013 Wellington, New Zealand Treasury.
- NZIER (2004). Ageing New Zealand and Health and Disability Services: Demand Projections and Workforce Implications, 2001 - 2021. A Discussion Document. Wellington, Ministry of Health.

- OECD (2015). Addressing Dementia - The OECD Response. OECD Health Policy Studies. Paris, OECD.
- Palliative Care Australia (2010). Health System Reform and Care at the End of Life: a Guidance Document. Canberra, Palliative Care Australia.
- Palliative Care Council (2015). Updated Projections of Deaths in New Zealand, Wellington: Cancer Control New Zealand.
- Perry, B. (2016). Household Incomes in New Zealand: trends in indicators of inequality and hardship 1982 to 2015. Ministry of Social Development. Wellington.
- Plouffe, L. and A. Kalache (2010). "Towards global age-friendly cities: determining urban features that promote active aging." Journal of Urban Health **87**(5): 733 - 739.
- Posarac, A. Economics of care and care economy. DOI: [siteresources.worldbank.org/.../CARE\\_ECONOMY\\_OR\\_ECONOMICS](http://siteresources.worldbank.org/.../CARE_ECONOMY_OR_ECONOMICS)
- Prince, M., A. Wimo, M. Guerchet, G.-C. Ali, Y.-T. Wu and M. Prina (2015). World Alzheimer Report: The Global Impact of Dementia: An analysis of prevalence, incidence, cost & trends. London, Alzheimer's Disease International.
- Ravenswood, K., J. Douglas and S. Teo (2015). The New Zealand Aged Care Workforce Survey 2014. Future of Work Programme. Auckland, New Zealand Work Research Institute.
- Statistics New Zealand (2013). 2013 Census QuickStats about national highlights. Wellington, Statistics New Zealand.
- Statistics New Zealand (2013b) How will New Zealand's ageing population affect the property market? DOI: [http://www.stats.govt.nz/browse\\_for\\_stats/population/estimates\\_and\\_projections/ageing-population-property-market.aspx](http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/ageing-population-property-market.aspx)
- Statistics New Zealand (2014) 2013 Census QuickStats about national highlights. DOI: [http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-work-unpaid/industries\\_employed\\_adults.aspx](http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-work-unpaid/industries_employed_adults.aspx)
- Statistics New Zealand (2014) National population projections. DOI: [http://www.stats.govt.nz/browse\\_for\\_stats/population/estimates\\_and\\_projections/projections-overview/nat-pop-proj.aspx](http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/projections-overview/nat-pop-proj.aspx)
- Statistics New Zealand (2014) National population projections 2011-base to 2061. DOI: [http://www.stats.govt.nz/tools\\_and\\_services/nzdotstat/population-projections.aspx#ethnic](http://www.stats.govt.nz/tools_and_services/nzdotstat/population-projections.aspx#ethnic)
- Statistics New Zealand (2014a). Disability Survey 2013. Wellington, Statistics New Zealand.
- Stowe, S. and S. Harding (2010). "Telecare, telehealth and telemedicine." European Geriatric Medicine **1**(3): 193 - 197.
- stuff.co.nz (2015) Bill English reassures "super is sustainable" in Wanaka charm offensive 26 November. stuff politics DOI: <http://www.stuff.co.nz/national/politics/74442005/Bill-English-reassures-super-is-sustainable-in-Wanaka-charm-offensive>
- The Treasury (2016). He Tirohanga Moko-puna: 2016 Statement on the Long-Term Fiscal Position November 2016. Statement on the Long-Term Fiscal Position. Wellington, New Zealand Government.
- Tsai, Y. (2015). "Social security income and the utilization of home care: Evidence from the social security notch." Journal of Health Economics **43**: 25 - 55.
- Van Houtven, H. C., N. B. Coe and M. M. Skira (2013). "The effect of informal care on work and wages." Journal of Health Economics **32**: 240 - 252.