Longevity Trends and their Implications for the Age of Eligibility for New Zealand Superannuation

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Longevity Trends and their Implications for the Age of Eligibility for New Zealand Superannuation[1]

Alison O'Connell

Executive Summary[2]

This paper focuses on New Zealand's longevity trends and their relevance to the age of eligibility for New Zealand Superannuation (NZS). The age of eligibility for NZS was a key issue in the 2010 and previous Reviews of Retirement Income Policy. The paper investigates longevity trends as a driver for considering reform of the age of eligibility, including possible ways in which the age of eligibility could be linked to forecasts of future life expectancy.

Section 1: Longer lives are an ongoing trend

Population ageing is a long-term change caused by two persistent demographic trends: New Zealanders are having fewer children and living longer than they used to. This paper focuses on people living longer. Most people live to age 65, and it is no longer the case that a significant proportion of the population dies between ages 65 and 70. Today's new superannuitants are more likely to live to age 70 than their parents were to live to age 65, and the children of today's new superannuitants are more likely to live to age 70 than their parents were to reach age 65.

Today's new superannuitants stand to receive New Zealand Superannuation (NZS) for over 20 years (men) and over 23 years (women) on average. Successive cohorts are expected to live increasingly longer, so that today's 25-year-old men live for over 25 years after age 65 on average and women for over 27 years. All the main official demographic projections for New Zealand and its peer countries anticipate steadily rising average life expectancy in future. Pessimism on life expectancy prospects does not dismiss the rationale for an increase in eligibility age. It simply slows the timetable.

Section 2: Reflect variation in lifespans and increasing average lifespans in eligibility age policy

Lifespans are becoming more similar as well as longer on average, as more people reach the oldest ages. It is becoming increasingly important to preserve the role of New Zealand Superannuation as insurance against "living too long".

On average, Asian residents have longer lifespans, and Māori and Pasifika have shorter lifespans compared to the rest of the New Zealand population. Many other factors are also associated with better or worse longevity and it is not fully understood how much different factors contribute or what factors *cause* certain outcomes.

Eligibility age for New Zealand Superannuation is not the policy lever to address variable health or lifespan outcomes. This should be an active part of health and social policy. Differentiating age of eligibility by any dynamic or self-assessed factor such as ethnicity, income or health status is unworkable. However, variations in lifespan can be taken into account in setting eligibility age.

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[1] This paper is one of a number of background papers commissioned by the Commission for Financial Literacy and Retirement Income for the 2013 Review of Retirement Income Policy. These papers help set the scene for consultation and debate.

[2] A glossary of terms is provided at the end of this paper.

Section 3: 'Schedule and review' eligibility age increases using a structured framework

There is a relentless logic: it gets harder to fund income for an increasing length of time over age 65 from a fixed length of time under age 65. The rationale for meeting this by raising eligibility age (whether or not reforms not covered in this paper such as benefit reductions or tax increases are made) is that pushing out eligibility age matches the stretching of lifespans.

Pension ages are on the rise in most of the OECD: "67 – or higher – is becoming the new 65". No country is automatically linking pension ages to life expectancy. The UK assessed the difficulties in doing so and proposes instead using a structured framework to keep eligibility age in line with increasing longevity while also explicitly addressing wider factors of concern.

An illustration of how this could work in New Zealand is developed in this paper. A **schedule** of future eligibility age increases is based on a core principle of maintaining the current proportion of adult life spent receiving New Zealand Superannuation. Regular **reviews** of trends in longevity, economic and social factors could offer reasons to change this schedule but a minimum 10-year notice period would have to be given for any change. This 'schedule and review' framework balances objective rationale with informed consideration of dynamic and imprecise issues.

Under this illustration, and assuming the necessary policy work, consultation and legislation is completed in four years, by 2017 the 1962 birth cohort would be the first to start receiving New Zealand Superannuation later than their 65th birthday. A 1-year increase in eligibility age would be completed every 10 calendar years so the cohort born in 1988 (today's 28-year-olds) would have a scheduled eligibility age of 68.

The schedule illustrated here is slower than that of other countries. Under this schedule each future cohort would still be expected to receive NZS for longer than today's new superannuitants. Today's 28-year-olds would be expected to receive NZS for longer than the cohort aged 85 who had an eligibility age of 60 years.

Section 4: Addressing eligibility age can help reduce New Zealanders' longevity risk

Most adult New Zealanders underestimate their likely lifespan and face longevity risk. This is at least partly because the cues, data and messages about retirement and lifespans expectations in public debate are not as helpful as they could be in setting expectations

Consistently using correct indicators for likely future lifespans in public debate, the media and advice calculators should help make longevity expectations more accurate.

If people better understand "we are all living longer" the rationale for raising age of eligibility may become easier to bear. An evidence-based public debate about eligibility age provides an opportunity to increase awareness of longer lifespans and associated risks

Introduction

This paper focuses on New Zealand's longevity trends and their relevance to the age of eligibility for New Zealand Superannuation (NZS). The age of eligibility for NZS was a key issue in the 2010 and previous Reviews.

The 2010 Review highlighted the increasing cost of NZS as more New Zealanders live to the age of eligibility (currently 65 years) and live longer in receipt of NZS. The 2010 Review proposed increasing the age of eligibility to 67 years, considering it likely that people will want to keep working for longer, that the increasing cost of NZS will need to be tamed, and that any unfair disadvantage caused by a higher age can be mitigated.

Since 2010, new projections from Statistics New Zealand indicate further improvements in life expectancy. Other proposals have been made to increase the age of eligibility in New Zealand. More countries have decided to increase their eligibility age or hastened existing plans, citing continuing lengthening of lifespan as a key driver.

Reform of New Zealand Superannuation could cover other drivers (such as costs, or different views of equity) and other aspects of its structure (for example PAYGO vs. SAYGO, eligibility criteria based on income or residency). These potential reforms are considered elsewhere.

Whether or not some of these other reforms happen, longevity trends are still a reality and raising age of eligibility is a potential response. The paper investigates longevity trends as a driver for considering reform of the age of eligibility, including possible ways in which the age of eligibility could be linked to forecasts of future life expectancy.

1.   Longer lives are an ongoing trend

New Zealand, like all developed countries, has an ageing population. Past trends have been well documented and are used to estimate what could happen in future. A succinct indicator is median age, which for New Zealand increased from 26 years in 1971 to 37 years in 2012 and is expected to exceed 41 years by the late 2030s[3].

High numbers of "baby boomers" born in 1946-65 are now reaching age 65. This temporary acceleration of the growth in the number of superannuitants is not the same as population ageing. **Population ageing is a persistent change in the age structure of the population, caused by two long-term demographic trends: New Zealanders are having fewer children and living longer than they used to. This paper focuses on people living longer.**

This section offers data to demonstrate the key longevity trends relevant to the age of eligibility debate:

- the increasing likelihood of New Zealanders reaching the current age of eligibility (65 years), and,
- the increasing length of time New Zealanders live after age 65.

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[3] Statistics New Zealand (2012b). Median age is defined by half the population being older and half younger than this age.

1.1   Increasing likelihood of reaching the age of eligibility

To examine the chances of reaching age 65, we can look back as far as people born in the late 1800's. Figures 1 and 2 show, for males and females, the proportion of each cohort who, having reached adulthood at age 20, then went on to reach ages 65, 67 and 70.[4]

The figures show the steady increase in the chance of living to ages 65, 67 and 70 for successive cohorts, interrupted only by the effects of war on men. The narrowing of the lines show that the chance of living to age 70 has become closer to the chance of living to age 65. **Most people live to age 65, and it is no longer the case that a significant proportion of the population dies between ages 65 and 70.**

- For today's superannuitants and successive generations, over 85 per cent of men and over 90 per cent of women are expected to survive adulthood to reach age 65.
- For cohorts born 30 years before or earlier (pre-1918), those figures would be at least ten percentage points lower.
- The chances of dying between age 65 to age 70 decreased from around 15 per cent (men) and 8 per cent (women) for the 1918 cohort to 6 per cent/4 per cent for today's new superannuitants. The chances are set to more than halve again for today's 25-year-olds.

Figure 1: Proportion of each cohort expected to live from age 20 to age 65, 67 and 70, birth cohorts from 1876, male[5]

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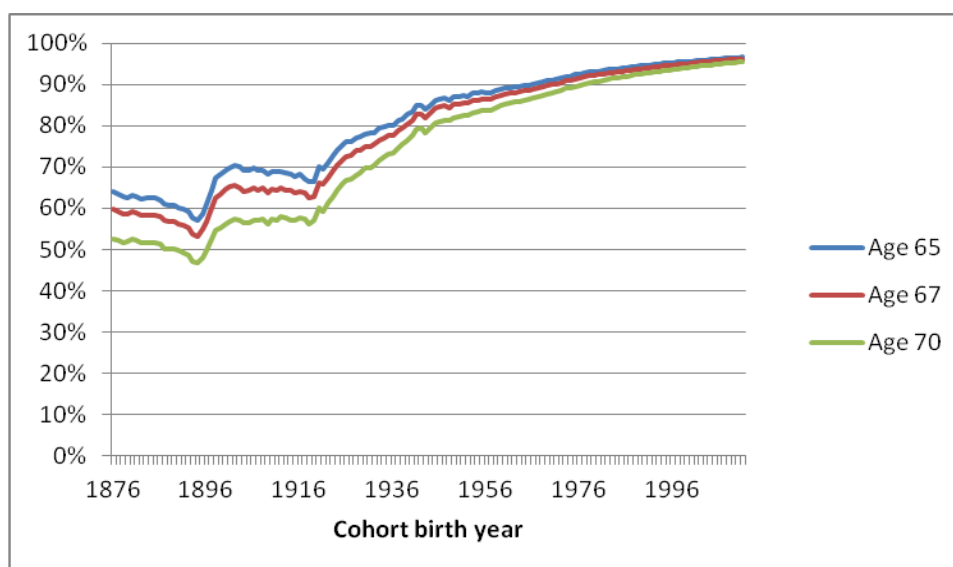
[4] We are concerned with the question of how many adults stand to receive superannuation after working age. The receipt of benefits at child ages and child mortality are not relevant. The choice of age 20 as the start of adulthood is made for consistency with the analysis made in the UK's pension age framework - see later.

[5] Unless otherwise stated, data for this and other figures, tables and estimates in this section are from author's calculations made using figures supplied by Statistics New Zealand, consistent with cohort life tables (September 2012) and 2011-base national population projection mortality assumptions (July 2012). The median projection (50th percentile) is used unless otherwise stated.

Figure 2: Proportion of each cohort expected to live from age 20 to age 65, 67 and 70, birth cohorts from 1876, female
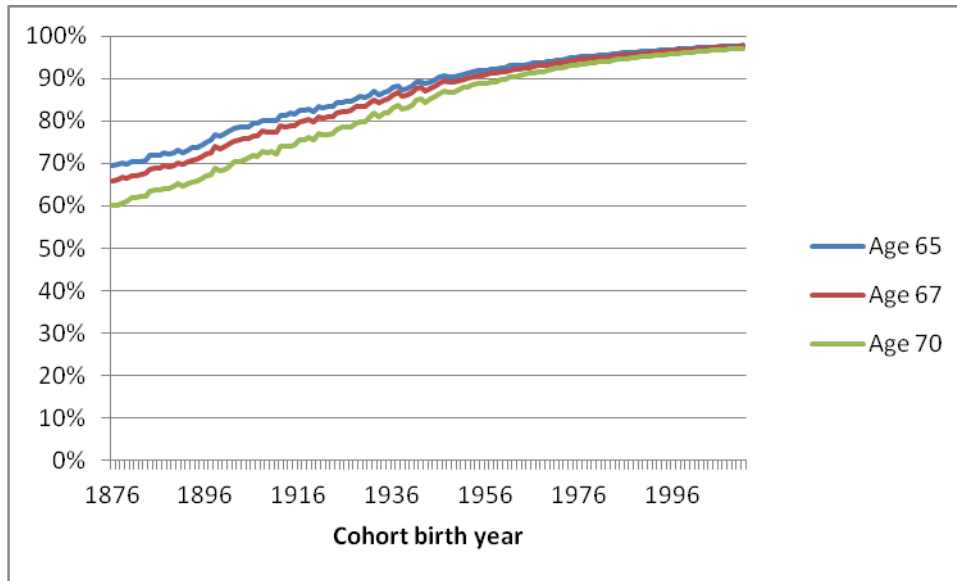

Table 1 shows the same data for selected cohorts of people alive today. Instead of showing percentages, the numbers show how many of 1,000 alive at the age of 20 for each cohort are expected to live to ages 65, 76 and 70. The cohort of today's new superannuitants is shaded.

Table 1: Number expected to live to age 65, 67 and 70 from 1,000 20-year-olds of each cohort

Year of birth	1928	1938	1948	1958	1968	1978	1988
Year age 65	1993	2003	2013	2023	2033	2043	2053
Age in 2013	85	75	65	55	45	35	25
Male							
To age 65	771	817	862	884	905	930	943
To age 67	739	794	844	869	894	921	936
To age 70	681	755	812	843	873	904	924
Female							
To age 65	853	873	904	921	938	952	962
To age 67	833	857	891	911	931	946	958
To age 70	795	827	868	893	917	936	949

These figures confirm the picture that:

- Today's new superannuitants are more likely to live to age 70 than their parents were to live to age 65.
- The children of today's new superannuitants are more likely to live to age 70 than their parents were to reach age 65.
- Around 950 out of 1,000 of today's 25-year-olds are expected to live to age 65, with over 920 reaching age 70.

1.2 Increasing length of time living after age 65

Given that most adults survive to start receiving New Zealand Superannuation, for how long do they then receive it? Table 2 shows the cohort life expectancy for those reaching age 65 in each demonstration cohort, first as a total lifespan then the number of years left to live after age 65. The upward trend is clear.

- Today's new superannuitants stand to receive New Zealand Superannuation for over 20 years (men) and over 23 years (women).
- Successive cohorts are expected to live increasingly longer, so that today's 25-year-old men live for over 25 years and women over 27 years after age 65.

Table 2: Cohort life expectancy at age 65: total lifespan and lifespan after age 65

Year of birth	1928	1938	1948	1958	1968	1978	1988
Age in 2013	85	75	65	55	45	35	25
Male	82.1	84.3	85.8	87.1	88.4	89.5	90.5
Female	85.4	86.9	88.3	89.6	90.7	91.7	92.6
Lifespan from age 65							
Male	17.1	19.3	20.8	22.1	23.4	24.5	25.5
Female	20.4	21.9	23.3	24.6	25.7	26.7	27.6

Table 3 analyses changes in the lifecourse for successive cohorts.

- On average, lifespan after age 65 for a cohort is over one year longer than that for the cohort born ten years previously.
- Today's new superannuitants are expected to spend nearly four years (men) or three years (women) longer over age 65 than the generation born twenty years earlier.
- The cohort twenty years younger than today's new superannuitants is expected to live around 2½ years longer after age 65.
- The proportion of adult life spent over age 65 has increased and it set to continue increasing.

Table 3: Changes in life-course for selected cohorts:
additional years of life after age 65 and proportion of adult life spent over age 65

Year of birth	1928	1938	1948	1958	1968	1978	1988
Age in 2013	**85**	**75**	**65**	**55**	**45**	**35**	**25**
Additional years of life after age 65 compared to cohort aged 65 in 2013							
Male	-3.7	-1.5	0.0	1.3	2.6	3.7	4.7
Female	-2.9	-1.4	0.0	1.3	2.4	3.4	4.3
Proportion of adult life (20+) aged 65+							
Male	27.5%	30.0%	31.6%	32.9%	34.2%	35.3%	36.2%
Female	31.2%	32.7%	34.1%	35.3%	36.4%	37.2%	38.0%

This analysis suggests some pointers for the age of eligibility of New Zealand Superannuation:

- If the sole aim in setting eligibility age were to keep constant from now the length of time receiving NZS, then, because on average, lifespan after age 65 for a cohort is over one year longer than that for the cohort born ten years previously:
    - a one year increase in eligibility age every ten years could be a useful rule of thumb.
    - a 2-year increase in eligibility age to age 67 would be more than justified for the cohort now aged 45.
- If the sole aim in setting eligibility age were to keep constant from now the proportion of adult life spent receiving NZS, then eligibility age would have to keep increasing.

1.3   Uncertainty in projected longevity estimates

Because future trends are uncertain, it is important to understand how likely it is that future longevity will turn out to follow these projections. For example, a question often asked is whether life expectancy could start to decrease rather than increase.

Statistics New Zealand handles uncertainty in its stochastic projections by producing percentiles which summarise the probability distribution for each assumption and projection result. Users are encouraged to make their own judgement about which projection(s) to use depending on their purpose.

The median projection (50th percentile) indicates that there is a 50 per cent chance that actual life expectancy will be higher and a 50 per cent chance that actual life expectancy will be lower than the median. The median is by definition the central projection of the range of projection results produced by Statistics New Zealand. It underlies the calculations shown so far in this section. The 5th percentile (for which there is an estimated 5 per cent chance that life expectancy will be lower)

is deemed equally likely as the 95th percentile (for which there is a 5 per cent chance that life expectancy will be higher).

The tables in the Appendix reproduce the tables in this section using Statistics New Zealand's 5th and 95th percentiles of life expectancy instead of the median. An optimistic scenario of higher life expectancy than the median is taken here to be represented by the 95th percentile; a pessimistic scenario of lower life expectancy by the 5th percentile.

The differences between projections are small for the near-term and get larger as uncertainty increases over time, but the same trends of improvement are seen.

Therefore, **pessimism on life expectancy prospects does not dismiss the rationale for an increase in eligibility age. It simply slows the timetable**.

- The chances of living to age 65 or 70 do not change significantly between percentiles. Even on the low life expectancy scenario, over 85 per cent of adult males and over 90 per cent of adult females currently below age 65 will reach that age. Out of 1,000 of today's 25-year-olds, only around 10 fewer will reach age 67 if actual cohort life expectancy is more like the low scenario than the median projection.
- The length of time lived after age 65 does vary between percentiles. On average, lifespan after age 65 for a cohort increases by 0.7 of a year compared to a cohort born ten years previously under the low life expectancy scenario. This was one year every ten birth years under the median projection. Under the high life expectancy scenario the increase is over 1½ years every ten birth years.
- The cohort twenty years younger than today's new superannuitants is expected to live at least 1½ years longer after age 65 under the low life expectancy scenario and around 3½ years longer under the high life expectancy scenario.
- Even on the low life expectancy scenario, an increase in average lifespan after age 65 exceeds 2 years for the cohort now aged 35. Therefore, on the logic of keeping average time receiving NZS constant, an eligibility age of 67 would be justified for this cohort.

How can a user test whether the projections are reasonable and decide how optimistic or pessimistic to be when making policy decisions? One suggested approach is to consider trends in factors that affect the chance of dying. Recent studies which analyse the impact of smoking and obesity trends in the US population show that potential gains from continued reductions in smoking and improvements in other causes of death outweigh the possible risk from obesity, so that overall life expectancy is still likely to improve[6]. However, knowledge of the way in which such factors change over time and interact with each other is incomplete, so projecting future population life expectancy using supposition of cause analysis is not reliable.

Past data reveal two fundamental demographic facts: the best cohort life expectancy in the world has increased continuously since the 1870s[7]; and life expectancy has only ever declined when countries have experienced specific severe direct assaults on mortality such as the significant

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[6] Crimmins et al. (2010); King and Soneji (2011); Preston et al. (2012). See also Christensen et al. (2009).
[7] Shkolnikov et al. (2011). See Didham and Cheung (2011) for past trends in selected countries.

HIV/AIDS epidemic in parts of Africa or the change in social order in post-Soviet states[8]. Of course the future can be different from the past, and there may be temporary increases in death rates for some groups, but for average population lifespans to start getting shorter would be a very surprising reversal of long-term history.

Relying on this history, **all of the main official demographic projections for New Zealand and its peer countries anticipate steadily rising average life expectancy in future**. Different countries make different assumptions for the future *pace* of improvement in life expectancy, and illustrate the uncertainty in this assumption by showing different scenarios. Therefore, another approach to test the reasonableness of Statistics New Zealand's projections is to compare them against those in other countries.

Figure 3 makes such a comparison for one cohort life expectancy data point. Other age and calendar year data show similar pictures. The range for each country follows how that national agency illustrates uncertainty. The UK shows a high, medium and low scenario, similar to New Zealand's 5th, median and 95th percentiles. Australia shows two scenarios.

Figure 3: Cohort life expectancy at age 65 in 2050 in years, Australia, New Zealand and UK[9]
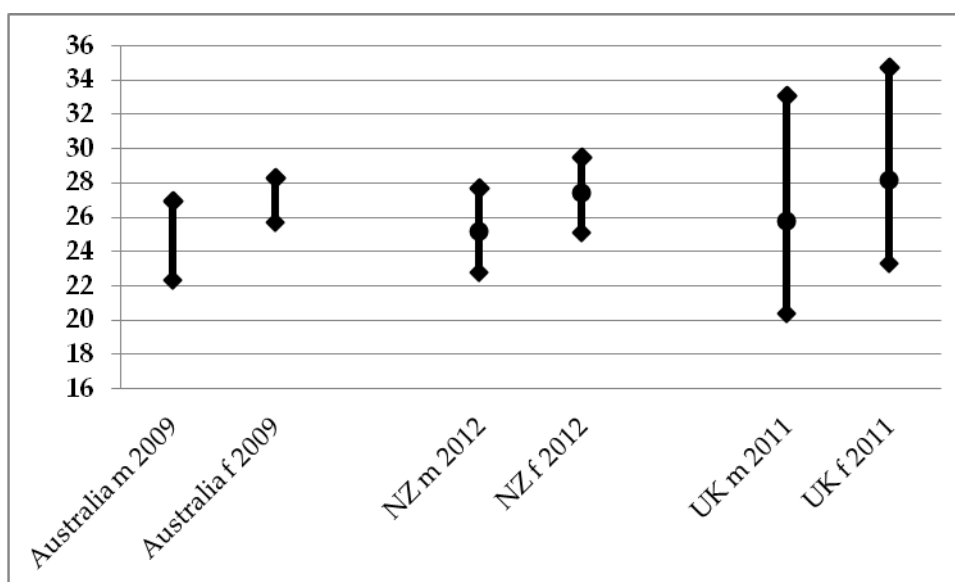
Statistics New Zealand states that New Zealand's life expectancy assumptions are broadly consistent with those in other countries. Figure 3 confirms this. Comparing against the closest mortality comparator countries Australia and UK[10], New Zealand's future life expectancy appears more likely to be towards the high life expectancy scenario than towards the low life expectancy scenario.

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[8] Wilson (2011)

[9] From the latest cohort life expectancy projections published by the national statistics or actuarial agency. m = male; f = female. Sources: AGA (2009); Statistics New Zealand (2012b); ONS (2012a).

[10] See O'Connell (2012a). The pace of improvement in death rates in New Zealand has been higher than the UK's and more like Australia's since the 1980s (females) and 1990s (males).

A practical approach has to be found for policy decision-making despite uncertainty in projections of future longevity and despite different opinions of optimists and pessimists who believe longevity trends may track better or worse than past trends suggest. The approach explored later in this paper uses calculations from the middle of the available New Zealand-specific estimates - Statistics New Zealand's median projection - and allows flexibility to consider other issues and new evidence as it emerges.

2. Reflect variation in lifespans and increasing average lifespans in eligibility age policy

Analysis of New Zealand's longevity is necessarily carried out using average figures for the whole population. Policy decisions on eligibility age have to reflect that lifespans vary across a population and that some population groups have systematically better or worse lifespans; often referred to as "health disparities". Further, although eligibility age is not linked to ability to work, a concern commonly expressed is that poor health after the current eligibility age of 65 would restrict ability to work and therefore compromise the fairness of raising eligibility age.

This section discusses how eligibility age policy should reflect these issues, but cannot be the only lever to mitigate or address them.

2.1 Variability in lifespans

There is inherent variability of lifespans in any population. It is an integral feature of New Zealand Superannuation (and every similar public pension system) that there is a range of periods for which people receive it, and no-one can predict how long they will receive it for. **A key purpose of New Zealand Superannuation is that it provides insurance against longevity risk, or "living too long"[11].**

It is easy to focus on generalisations about lifespans without realising the diversity of experience, and therefore the value of insurance against living too long. To illustrate this, Figure 4 shows for males and females, the distribution of ages at death (equivalent to lifespan) for 100,000 New Zealanders aged 20 from the cohort born in 1948, today's new superannuitants.

Figure 4: Number of deaths at each age (from age 20 to 99) from 100,000 aged 20 from the cohort born in 1948, males and females[12]

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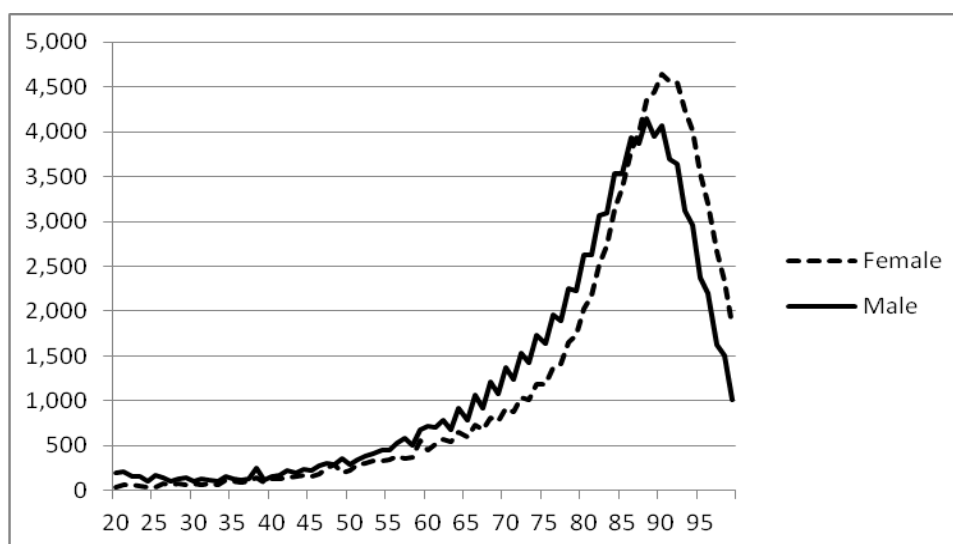
[11] One of the eight objectives for retirement income policy identified in the 2010 Review. See Retirement Commissioner (2010) p. 57.

[12] Data from author's calculations made using figures supplied by Statistics New Zealand, consistent with cohort life tables (September 2012) and 2011-base national population projection mortality assumptions (July 2012), median projection (50th percentile)

Figure 4 shows again that the vast majority of adults now live beyond age 65. The numbers of deaths start increasing at later ages faster for men than women, and reach a lower peak. The comparison shows that it is true to say "women live longer than men" *on average*, but men still have a good chance of dying at the oldest ages.

The peak age at death (also called the mode or modal age) is the age to which most people from a cohort live. For today's new superannuitants this peak age is 88 years for men and 90 years for women. Figures 5 and 6 illustrate how this peak lifespan is expected to change over time, for successive demonstration cohorts starting with the cohort of today's new superannuitants shown in Figure 4.

With each successive cohort, the peak age at death increases. For the youngest demonstration cohort, born in 1988, it is 91 years for men and 93 for women. There are fewer deaths at all ages up to the peak: people are living longer. The peak itself is narrowing but more people are living to the very oldest ages. In other words, **lifespans are becoming more similar as well as longer on average, as more people reach the oldest ages**. Evidence from a large number of countries over long time periods shows that increases in life expectancy are generally accompanied by decreases in lifespan variance across the whole population[13].

However, the evidence also shows increased variance at the very oldest ages. As more people live to the oldest ages then the uncertainty in how long we live plays out at older ages than it used to. Therefore, **it is becoming increasingly important to preserve the role of New Zealand Superannuation as insurance against "living too long".**

Figure 5: Number of deaths at each age (from age 20 to 99) from 100,000 aged 20 in decennial cohorts born 1948 to 1988, males[14]
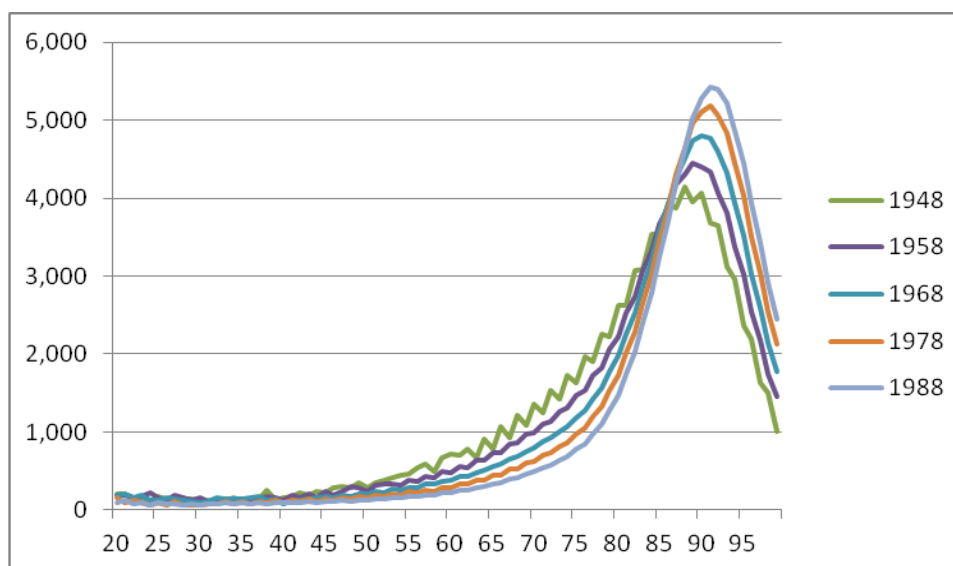
[13] See, for example, Smits and Monden (2009); O'Connell (2012b)

[14] Data for this and following figure from author's calculations made using figures supplied by Statistics New Zealand, consistent with cohort life tables (September 2012) and 2011-base national population projection mortality assumptions (July 2012), median projection (50th percentile)
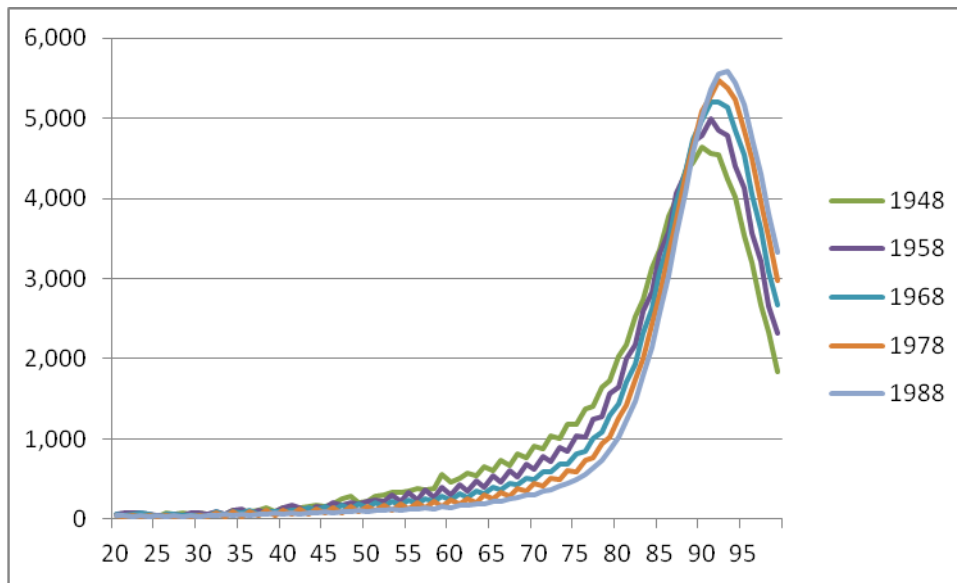
Figure 6: Number of deaths at each age (from age 20 to 99) from 100,000 aged 20 in decennial cohorts born 1948 to 1988, females

2.2 Health disparities

Given that there is a distribution of lifespans across a population, there are also factors which make the lifespan experience of specific groups in the population systematically better or worse than others. There is a great deal of international research investigating what may lie behind some groups of people being more likely to die earlier or later than the average of their national population.

There are very few instances of direct causality. Smoking is the obvious exception: it causes lung cancer. Only *associations* with a higher chance of early death have been found for a large number of other factors.

Associated factors include[15]: being male; never married; divorced or widowed; having worse socio-economic status, lower income or low level of education attainment; belonging to some ethnic groups, having experienced a relatively adverse environment at birth or in early childhood; having an unhealthy diet, obesity, taking inadequate exercise, excessive alcohol drinking, participating in hazardous sports or other risky behaviour; not accessing medical technology for treatment or prevention. There are also thought to be genes associated with exceptional longevity.

Overlaying the large number of influencing factors and the complex interplay between them, individual lifespan prospects are still to some extent a matter of chance[16]. Therefore, while the search for causes of shorter than average lifespans is valuable to help prioritise spending on treatment and prevention of health disparities, there will still be a distribution of lifespans in any population.

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[15] Harper and Howse (2008); Marmot (2005); WHO (2008); Baker et al. (2011); Barker (2007);Willcox et al. (2008); Carey (2003)

[16] Kuh et al. (2009)

Not all the possible influencing factors have been researched to the same extent. In the UK, for example, there is a good time series of data on associations between socio-economic group and *period* life expectancy: in 2002-06, the gap in period life expectancy at age 65 between the highest and lowest classes in England and Wales was 3.5 years for men and 3.2 years for women[17]. In addition, *cohort* life expectancies are produced by region. For example, the cohort life expectancy for a male aged 65 in 2013 in England & Wales is 21.6 years, but 19.9 years in Scotland[18].

In New Zealand, the most well-researched association with the distribution of lifespans is ethnicity. Despite problematic data[19], the evidence is that, **on average, Asian residents have longer lifespans, and Māori and Pasifika have shorter lifespans compared to the rest of the population**:

- Death rates at most ages are higher on average for Māori and Pasifika, and lower on average for Asian residents, compared to the New Zealand population not in those ethnic groups[20].
- There is no official data on *cohort* life expectancies for any ethnic group, but one estimate puts the difference in average cohort life expectancy at age 65 between Māori and non-Māori[21] at around 5 years.
- The relative contribution from various factors is difficult to disentangle. Part of the gap between average death rates of Māori and non-Māori has been found to be associated with social inequalities, differential tobacco use, income, and gender[22].

The future size of the gap between average lifespans of different ethnic groups is unclear from available research. However, **it seems somewhat pessimistic to assume that the size of the gap will be maintained, rather than narrowing**.

- Average (age-standardised) death rates of both Māori and non-Māori have reduced in recent years, at a similar pace overall. The absolute gap between these two groups in both death rates and life expectancy appears to have narrowed slightly[23].
- Statistics New Zealand's ethnic population projections assume slightly different average future reductions in death rates for each of the Māori, Asian, Pasifika and European/Other groups, with the overall effect that the absolute gaps between period life expectancies of each group narrow slightly[24].
- The gap between age-standardised death rates in ethnic groups has fluctuated year on year and will continue to do so. However, as with the national population, short-term fluctuations in average death rates happen alongside the long-term downward trend.

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[17] ONS (2012b), Section 3. Classes as defined by the National Statistics Socio-economic Classification.

[18] From Office for National Statistics 2010-based principal projection

[19] Statistics New Zealand (2010); Ministry of Health (2012); Cunningham (2013)

[20] Jatrana and Blakely (2008); Statistics New Zealand (2009)

[21] Blakely and Woodward (2011)

[22] Tobias et al. (2009); Carter et al. (2010)

[23] Blakely et al. (2007) and Blakely et al. (2008) cover 1981-2004; Ministry of Health (2012) covers 1996-2009.

[24] Statistics New Zealand (2010). Note though that these data are not intended as a precise measure of ethnic mortality or of mortality differentials between ethnic groups.

- The prospects for average death rates and lifespans for any population group should be consistent with the general conclusion of continued improvement in longevity, and convergence (reduction of variance) of average lifespans.
- Actions to narrow disparities in health and lifespan outcomes have been undertaken in recent decades and more are called for[25]. If these are successful, the gap by ethnicity could be narrowed faster. For example there is significant potential to improve Māori lifespans from the initiative for Smokefree Aotearoa/New Zealand 2025[26].
- However, because of the dynamic nature of New Zealand's ethnicity concept, the composition of the groups could change and variability within groups become more of an influence. For example, very poor outcomes could persist for a small 'group within a group'.

Reducing variance is (and should be) an active component of health and social policy. **Eligibility age for New Zealand Superannuation is not considered to be the policy lever to address variable health or lifespan outcomes**.

- Differentiating age of eligibility by any dynamic or self-assessed factor such as ethnicity, income or health status is unworkable[27]. It would also be against the near-universal trend to equalise eligibility age for even the easiest factor to define, gender[28].
- Increasing age of eligibility does not worsen inequity between groups if average lifespans for the groups increase at roughly the same pace over the long term. This appears to be the current case between ethnic groups in New Zealand.
- Warning signs that this is not the case can be addressed provided age of eligibility is not set purely on the basis of average lifespan data for the national population. Such signs could be short-term increases in the difference between average lifespans between groups, or changes in composition of groups. This is one reason why the UK government rejected the idea of indexing age of eligibility to average life expectancy in favour of a more considered approach - see the next section.
- Welfare policy addresses impacts from low incomes and poor health through benefits available below the eligibility age for New Zealand Superannuation. These benefits would continue to be available below an increased eligibility age. If it was desired to soften an eligibility age increase for the first cohorts affected, there could be a period of transition when these benefits are boosted for ages between old and new eligibility ages.

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[25] Blakely et al. (2011)

[26] Cunningham (2013)

[27] Blakely and Woodward (2011)

[28] Israel, Slovenia and Switzerland are the only OECD countries planning to maintain a lower pension age for women through to 2050

2.3   Healthy life expectancy

Despite increasing numbers of over-65s choosing to work, there is concern that poor health after the current eligibility age of 65 would restrict the ability to do so. Eligibility age for New Zealand Superannuation is not formally linked to work or retirement decisions, but ability to work is taken into account in eligibility age policy because some people would rely on being able to earn until New Zealand Superannuation is available.

Healthy life expectancy is a generic term for indicators of the amount of life expectancy that is expected to be free from specified levels of disability or illness. Compared to the data available on life expectancy, the data for healthy life expectancy is not from as long a time-series, as finely disaggregated by population groups or as comparable with international measures. However, in summary, evidence suggests that, in New Zealand[29]:

- Healthy life expectancy is increasing, as it is in other developed countries.
- Around two-thirds of the increase in average lifespan has been in good health (1996-2006). There is no consistent pattern across countries for what proportion of the extra years gained from longer lives is healthy; and it can change over short time periods.
- With over half of life expectancy over age 65 able to be lived independently, proposed increases of 2-3 years in eligibility age are well within periods of average healthy life expectancy.

Trends in health life expectancy therefore are consistent with how longevity trends are considered as a driver for increasing eligibility age. Data on healthy life expectancy can be considered in setting eligibility age as the framework described in the next section suggests.

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[29] Jagger (2012); Ministry of Health and Statistics New Zealand (2009); Graham et al. (2004), Christensen et al. (2009)

3. 'Schedule and review' eligibility age increases using a structured framework

The data in the previous section demonstrated the economic conundrum in an ageing population: finances have to be stretched over increasingly longer lives. **There is a relentless logic: it gets harder to fund income for an increasing length of time over age 65 from a fixed length of time under age 65.** Something has to change compared to what has been the case for previous generations. So far as New Zealand Superannuation is concerned, there are three broad options to keep costs and benefits in balance:

- Retain eligibility age at 65, but reduce the dollar amount of the New Zealand Superannuation benefit payment, *and/or*,
- Retain eligibility age at 65, and the level of New Zealand Super, but raise taxes (or divert them from other spending) to cope with the increasing cost, *and/or*,
- Retain the level of New Zealand Super, but raise the age of eligibility to reflect the increase in lifespans.

The same logic applies to individual savings too. Individuals may need to react to longer expected lifespans by trimming their retirement income ambitions, saving more and/or working to later ages. This is why changing the mix of private and public provision of retirement income (for example through compulsory saving) does not by itself address the longevity challenge. Section 4 considers how individuals can be kept aware of longevity trends and their implications to help make savings and retirement decisions. This section considers why the third option of raising the age of eligibility has been chosen in many countries and what it could mean for New Zealand Superannuation.

3.1 Longevity rationale for raising age of eligibility - 8 key arguments

The arguments that have been made for choosing the third option - raising eligibility age - cover a range of factors but the core principle is that pushing out the age matches the stretching of lifespans. The arguments summarised here have been made in New Zealand and elsewhere, and are all valid for New Zealand Superannuation. Raising age of eligibility:

   i. **Is the most direct logical link to the longevity trends** causing the financing stresses in pension systems.

   ii. **Is fair as it keeps benefits and costs (paid by all taxpayers) in balance according to longevity trends**. This is a form of "intergenerational equity".

  iii. **Helps people avoid "longevity risk"** by signalling the trend in longer lifespans in reaction to which people may need to adjust their own work and savings plans.

  iv. **Is a simple and transparent reform**.

   v. **May be unpopular to some, but may be more palatable to more people than other options** of raising taxes, cutting other spending or reducing benefit levels.

  vi. **Does not affect current superannuitants** and need not affect people close to age 65 provided it is signalled in advance to allow people to plan.

 vii. **May appear to disadvantage people at risk of "dying too soon", but in fact maintains the equity of a system which provides insurance for "living too long".** This is becoming increasingly important as more people live to the oldest ages.

viii.   Tames the increase in the cost of superannuation so freeing tax revenue which could be directed elsewhere such as addressing health inequities and to income support for people unable to earn before receiving superannuation.

3.2   International debate and policy changes

The OECD tracks pension reforms in its member countries. Its latest report shows the extent of pension age increase so far (emphasis added):

> "**Pension ages are on the rise in most of the OECD**: 19 out of 34 countries for men and 23 for women. Current legislation will push the [average] pension age for men to 65.6 in 2050 and 65.0 for women."[30]

> "**Age 65 remains the modal age at which people normally draw their pensions**, accounting for 17, or half, of OECD countries for men and 14 countries for women. **But 67 – or higher – is becoming the new 65**. Some 13 countries (12 for women) are either increasing pension ages to this level or, in the cases of Iceland and Norway, are already there."[31]

In many European countries with fiscal challenges from the Global Financial Crisis (GFC), it has proven difficult to reform very generous public provision and increase pension age even to 65. In a few of these countries, the fiscal imperative has required a dramatic increase in pension ages from below age 65 to beyond. However, the countries which plan to increase pension age beyond age 65 are not only those facing dramatic pressures after the GFC.

Many of New Zealand's peer nations are planning higher pension ages, as illustrated by this snapshot of what the situation will be in 2030[32]:

- **Ten OECD countries will have a pension age for both men and women of 67**: Australia, Denmark, Germany, Iceland, Italy, Netherlands, Norway, Spain, the UK and US. In addition, the pension age for men in Israel and Poland will be 67.
- **One country will have a pension age for both men and women of 68** for its main state pension benefit: Ireland.
- **Four countries will be on a schedule for further increases to 68 or higher**: the Czech Republic (where the pension age will only be 63 in 2030), Denmark, Italy and the UK.

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[30] OECD (2012) p. 28. Note that from the 1950s to late 1990s, the average pension age in the OECD trended *down*.

[31] OECD (2012) p. 26

[32] The pension age for Denmark and Italy is estimated by the OECD based on projections of future mortality outcomes

3.3   Linking age of eligibility to longevity trends

Governments' reasons for raising pension age in many of New Zealand's peer nations are often explicitly linked to increases in lifespans, as these examples from Australia and the UK show:

> "When the Age Pension was introduced, a male retiring at age 65 would have expected to spend 11 years in retirement. At that time, around half of the male population reached retirement age. Today over 85 per cent of the male population reaches retirement age and can expect to spend over 19 years in retirement."
> Australian Government (2009)

> "In 1980, a woman of 65 would have been expected to live to 83, on average. Her daughter, reaching 65 this year, can expect to live to 89, on average. And her granddaughter, when she reaches 65 in 2040, should expect to live to 92, on average. In three generations, the expected average length of life after age 65 has risen by nine years…"
> UK's Department for Work and Pensions (2010) pp.10-11

Given the strong lifespan link to the rationale for increasing pension ages, there are often calls to *index* the pension age to life expectancy. It is sometimes suggested that this would 'take the politics out' of what is usually an unpopular reform. However, **no country is purely automatically linking pension ages to life expectancy**[33]. Denmark, Greece and Italy are planning a form of indexation, but even for these countries, indexing has not yet taken place, and is not fully automatic as it could be overruled by Parliamentary approval (in the case of Denmark) or minimum expenditure clauses (Italy, Greece).

The UK government recently rejected an indexing approach for the eligibility age of the public pension there[34]. The reasons underlying this decision include[35]:

- **It would not be straightforward to decide on a single formula to represent all the factors involved**. For example, what formula: keeping length of time receiving benefit constant or proportion of adult life? Using male or female life expectancy or the average of the two? Set the starting point today or an earlier date, before the significant improvement in older age death rates? Which projection scenario?
- **No formula is likely to be robust enough to give the required stability in its result**. This is because projections change frequently as new information emerges which could lead to unacceptably sudden changes in pension age and uncertainty for individuals as to what their own pension age might be.
- **Average life expectancy is not the only consideration that should be made in setting pension age**. Also important, but not always able to be captured by precise data or even with consensus expert opinion are: the variation in lifespans; short-or long-term trends in

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[33] OECD (2012) p. 65. This publication also describes countries with public defined contribution (DC) or notional DC plans where pension *benefits* have been linked to life expectancy, but these examples are not relevant for the defined benefit New Zealand Superannuation.

[34] DWP (2013)

[35] See also Institute and Faculty of Actuaries (2011)

lifespan for sub-groups of the population; patterns of health and ability to work at older ages; trends in healthy life expectancy; practical issues on timing in relation to other reforms or legislation changes that may occur; labour market pressures; and, the economic circumstances of the country.

Instead, the UK government has proposed a "**structured framework**" to keep pension age broadly increasing in line with increasing lifespans while reflecting uncertainties in the wider situation and still giving individuals clarity on what their own pension age will be[36]:

- The **core principle to be followed as closely as possible will be to maintain the current proportion of adult life spent in receipt of a state pension**. Currently, around one-third of life aged 20 and over is spent over pension age.
- The application of this principle will be tested by **5-yearly multi-dimensional reviews**.
    - The **Government Actuary's Department will analyse the likely future trend in proportion of adult life in receipt of state pension** and future changes in pension age required to maintain that proportion.
    - **An independent body will provide a second report on a range of related issues** which should cover those subjects of imprecise data or differing expert opinion listed above. Specifically mentioned as being included are variations in lifespan by socio-economic groups or region, healthy life expectancy, alternate measures of life expectancy and impact on the labour market.
- The Cabinet Minister responsible will publish a report on the outcome of the review, and **any decision to change pension age will need to be approved by Parliament.**
- Based on consultation of what would be sufficient notice, a **minimum 10-year notice period for any change in pension age is proposed**.

This approach is more balanced than pure indexing. It follows the logic of increasing eligibility age in line with increasing longevity, and gives reasonable warning about age of eligibility changes, while allowing for uncertainties, short-term trends and wider issues.

3.4   A structured framework applied to New Zealand Superannuation

A structured framework consisting of a schedule of eligibility age increases plus regular reviews could be incorporated into New Zealand policy processes. Some New Zealand-specific details would need to be defined:

- The core principle of how eligibility age will approximately follow longevity trends.
- The frequency, composition and authorship of review(s).
- The length of notice period.

In what follows, we investigate what such a framework could mean for eligibility age in New Zealand. We assume regular multi-dimensional reviews covering a range of longevity, economic and social factors - including those defined in the UK framework - which could make the case for changes to a schedule of future eligibility increases. Note that New Zealand's reviews could be held

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[36] For details see Section 6 of DWP (2013)

every six years, to coincide with alternate Reviews of Retirement Income Policy by the Retirement Commissioner.

New Zealand would start this process by setting a schedule of future eligibility age increases in line with the core principle selected for the framework. To illustrate, shown here are the results of a process to develop a starting schedule using two alternative core principles. The process followed is:

i. **Adopt a core principle.** Two alternatives are shown:
   - *Fixed period*: maintain a fixed period in receipt of New Zealand Superannuation, so keep expected remaining lifespan at eligibility age constant over time.
   - *Fixed proportion:* maintain a set proportion of adult life spent in receipt of New Zealand Superannuation, so keep expected lifespan at eligibility age as a proportion of years between age 20 and eligibility age constant over time.
ii. **Set the baseline for each alternative as that which applies to the superannuitants reaching age 65 in 2013, separately for men and women**. Setting the current baseline now is generous as it implies earlier improvement in lifespans is cost-free. The application separately by gender is based on the fact that there is currently a difference between both fixed proportion and fixed term parameters. It is practical to apply the principle separately for men and women and then consider how to merge into a unisex schedule of age increases later.
   - Fixed term: period in receipt of New Zealand Superannuation for today's new superannuitants is 20.8 years for men and 23.3 years for women (Table 2).
   - Fixed proportion: proportion of adult life spent receiving New Zealand Superannuation for today's new superannuitants is 31.6 per cent for men and 34.1 per cent for women (Table 3).
iii. **Use the latest Statistics New Zealand cohort life expectancy median projection to solve for implied eligibility age for successive cohorts.** The availability of such data now allows this calculation to be done technically correctly for each cohort. The median is used here as that is the central and most commonly used projection. The calculation could also be carried out using other projections, and expert views sought on whether the median is optimistic or pessimistic.
iv. **Consider a range of practical, economic and social issues to set a starting schedule roughly matching the results from above**. For example, to smooth the schedule if desired and reflect uncertainty in projections, equity and other concerns.

Table 4 shows the implied eligibility age for the younger demonstration cohorts that could be affected by any change to eligibility age (ignoring notice period constraints). This is the result of Steps 1-3 of the process.

Table 4 illustrates the difficulty in finding a single formula for pure indexing. The implied increases are very different depending on which core principle is chosen and for men and women. Some judgement is necessary to adjust these calculated results into a smooth schedule which can be easily communicated; this is Step 4.

Year of birth	1958	1968	1978	1988
Age in 2013	**55**	**45**	**35**	**25**
Implied eligibility age using "fixed term" core principle				
Male	66 y 7 m	68 y	69 y 3 m	70 y 3 m
Female	66 y 5 m	67 y 8 m	68 y 8 m	69 y 8 m
Implied eligibility age using "fixed proportion" core principle				
Male	66 y	67 y	67 y 9 m	68 y 6 m
Female	65 y 11 m	66 y 8 m	67 y 5 m	68 y

One approach to adjusting the results in Table 4 to achieve a smooth schedule is described below, with the results following in Table 5.

- The **fixed proportion principle** is used in preference to the fixed term principle. If the period after eligibility age is determined according to the fixed period principle, all the adjustment has to occur before eligibility age. On the other hand, with the fixed proportion approach, the period after eligibility age is allowed to get longer, so some of the adjustment takes place after the age and less adjustment is needed before the age. The fixed proportion principle therefore gives a less severe approach, as Table 4 shows. The UK cites fairness between generations as the reason for choosing the fixed proportion principle[38]. The 'cohort self-funding' objective of the New Zealand system also suggests that the same principle should be adopted here[39].

- **Setting eligibility age the same for men and women can be used to shift advantage where it seems required from health equity considerations**. Under the fixed proportion principle, the eligibility age for the 1988 birth cohort (today's 25-year-olds) would be 68 years exactly for women and six months later for men. Setting eligibility age for the entire cohort at 68 favours men so can be taken as an approximate adjustment for the negative influences on death rates which tend to accumulate for men, while maintaining equality in eligibility age which favours women.

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[37] Author's calculations using Statistics New Zealand's cohort life tables (September 2012) consistent with 2011-base national population projection mortality assumptions (July 2012), median projection.
y = years, m = months.

[38] The UK's approach is a result of a review and consultation process, see DWP (2013) p. 76. The UK's proportional approach is echoed by the policy in France, where contribution period is altered to achieve two-thirds of adult life before eligibility age and one-third after.

[39] Retirement Commissioner (2010) p. 56

- **Adopting a 10-year notice period** means it is already too late to change eligibility age for the 1958 cohort. Assuming the necessary policy work, consultation and legislation is completed in four years, by 2017, then the 1962 birth cohort would be the first to start receiving New Zealand Superannuation later than their 65th birthday. Drawing a straight line to an eligibility age of 68 then makes for **a smooth and regular schedule** of completing a 1-year increase in eligibility age every 10 calendar years, as Tables 5 and 6 show.

Table 5: Implied smooth schedule for eligibility age by cohort using the longevity rationale explained in this paper, compared to 2010 Review proposal and current policy in Australia and UK[40], males and females

Year of birth	1958	1968	1978	1988
Age in 2013	55	45	35	25
Using illustrated structured framework	65 y	65 y 9 m	66 y 11 m	68 y
2010 Review proposal	65 y 8 m	67 y	67 y	67 y
Australia	67 y	67 y	67 y	67 y
UK*	66 y	66 y 2 m	68 y	68 y

Table 6: Implied smooth schedule for first calendar year that eligibility age reaches age 66, 67 and 68 using the longevity rationale explained in this paper, compared to 2010 Review proposal and current policy in Australia and UK[41], males and females

First calendar year that eligibility age reaches:	Age 66	Age 67	Age 68
Using illustrated structured framework	2036	2046	2056
2010 Review proposal	2026	2033	n/a
Australia	2020	2024	n/a
UK	2020	2028	2046

The schedule illustrated here is slower than the Retirement Commissioner's previous proposal and the plans in Australia and the UK. Starting later, with a 10-year notice period, is relatively generous to cohorts born around 1975 and earlier, meaning **New Zealand would have a comparatively**

[40] Author's calculations using Statistics New Zealand's cohort life tables (September 2012) consistent with 2011-base national population projection mortality assumptions (July 2012), median projection.
y = years, m = months. 2010 Review proposal from Retirement Commissioner (2010). For UK see UK Government (2013); for Australia see Australian Government (2013). * birthday 30 June.
[41] As Table 5

benign change in future eligibility ag*e*. A slow start can be seen as reflecting concerns about socio-economic or ethnic differences in lifespans in New Zealand; essentially allowing more years of longevity improvements before beginning the increase in eligibility age.

This illustrative schedule aims to maintain proportion of adult life spent receiving New Zealand Superannuation. In addition, under this schedule, **each future cohort would still be expected to receive NZS for longer than has been the case for each cohort since the age of eligibility was set at 65, including today's new superannuitants**. Even with an eligibility age of 68 years, today's 25-year-olds would be expected to receive NZS for longer than the cohort aged 85 who had an eligibility age of 60 years (Figure 7).

Figure 7: Lifespan from eligibility age (actual past age and future ages using illustrated structured framework) for demonstration cohorts by birth year, in years[42]
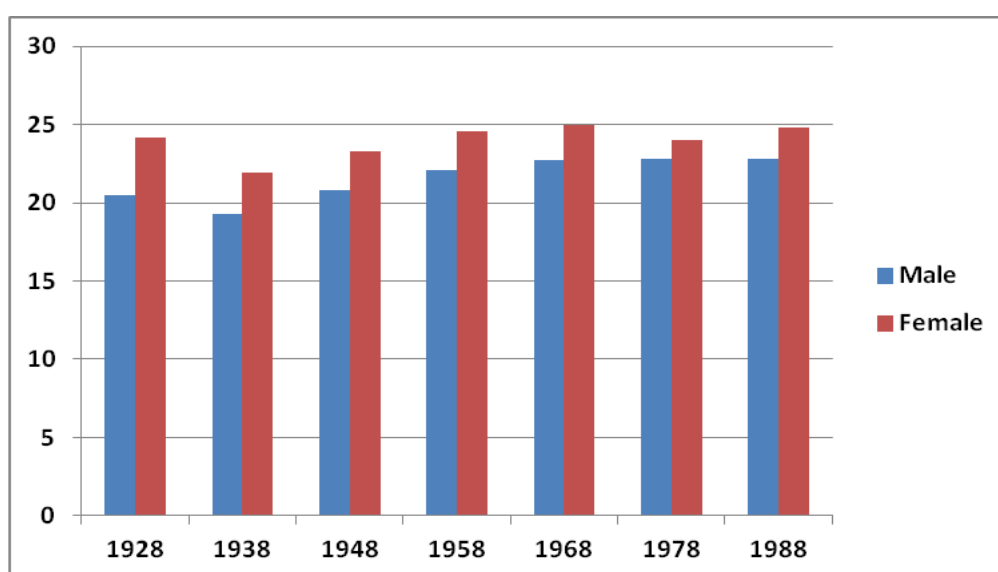
The fiscal impact of such a schedule has not been considered. The slow start may not be acceptable if there is an aim to lower the cost of NZS in the short to medium term. However, **setting in legislation a structured framework for a steady future rise in eligibility age on a longevity rationale should have fiscal benefits.** For example, it should help improve assessments of New Zealand's fiscal position by outside parties including rating agencies.

Policy decision making should include more detailed assessment than this illustration provides. However, what is shown here suggests *a* **'schedule and review' framework balances objective rationale with informed consideration of dynamic and imprecise issues**. Adopting such a structured framework offers a way of working through and explaining an eligibility age policy decision in more than purely political terms.

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[42] Author's calculations using Statistics New Zealand's cohort life tables (September 2012) consistent with 2011-base national population projection mortality assumptions (July 2012), median projection.

4. Addressing eligibility age can help reduce New Zealanders' longevity risk

Whether or not eligibility age increases, each generation of New Zealanders is living longer than the previous one. On the basis that people should know this to help their own retirement - and life - planning, this section considers what people do know and what tools could be used to help raise awareness of longevity trends.

Most adult New Zealanders underestimate their likely lifespan. Data collected in the 2009 Financial Knowledge survey suggested[43]:

• Around 65 per cent of adult New Zealanders underestimated their likely lifespan, 15 per cent overestimated and only 20 per cent got it about right.
• On average, men underestimated by over five years and women by over seven years.
• It seems to be the case that people base their expectations on the current pattern of mortality in the population, or on their own parents' or grandparents' lives, so fail to appreciate lifespans have been increasing and are continuing to do so.

Probably based to some extent on unrealistic expectations of lifespan, many New Zealanders face longevity risk from both "retiring too early" and "dying too late". Behind this problem lie cues in public debate which fail to signal the potential for longevity risk:

• **The most appropriate measure of expected lifespans has been published by Statistics New Zealand only since 2012**. Before then, period life expectancy was universally used to signal expected lifespans where cohort life expectancy would have been more helpful. Cohort life expectancy is higher than period life expectancy, because it reflects expected future declining death rates. This has meant that:
    o **Headline figures have been misleading**. Period life expectancies have been incorrectly interpreted, for example, implying that boys born in 2006 had an average expected lifespan of 78 years and girls of 82 years[44]. Using newly-available cohort life expectancies, it can now be properly referenced that those born in 2006 have expected average lifespans of 89 (boys) and 92 years (girls)[45].
    o **A large jump in expectations is required to correct headline lifespans**. Using the latest data, cohort life expectancies for people born in 2012 have been properly referenced in the media as 90 (boys) and 93 years (girls)[46]. However, if people have in their minds the often-referenced late seventies or early eighties ("78 or 82") they may not have yet caught up with the new benchmarks of early nineties ("90 or 93").
    o **A correct sense of the *pace* of increase in average lifespans over time has not yet been evident**. Period life expectancy increases more slowly over time than cohort

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[43] See O'Connell (2012a) for more on the thinking behind this section including 2009 ANZ-Retirement Commission Financial Knowledge survey results and analysis

[44] For example, Bingham (15 November 2008). These figures are *period* life expectancy at birth, 2005-7.

[45] Statistics New Zealand (2012a)

[46] For example, Gibson (20 July 2012). These are *cohort* life expectancies for those born in 2012, median projection.

for the same change in death rates[47]. However, we have not yet seen enough of a time series of cohort life expectancy projections by which we can appreciate this.

- **Media articles about how long people are likely to live sometimes use data not fit for the purpose of signalling likely lifespans**. For example: "The data showed the average life expectancy for a New Zealander had increased 5.4 years in 20 years - from 75.3 in 1990 to 80.7 in 2010."[48] The article quotes a research report which uses period life expectancy appropriately for its specific purpose (comparing health outcomes across countries) but which is inappropriate to give information on likely lifespans.

- **By keeping eligibility age for New Zealand Superannuation fixed an opportunity has been missed to send a message that retirement might have to start later**. Current eligibility age is the most popular answer when asked "What age do you think you will retire?"[49] An estimated 70 per cent of working New Zealanders intend to retire at age 65 or earlier. As it acts as such a strong cue for retirement intentions, it is likely that increasing eligibility age would signal that those intentions should be reconsidered. Actual retirement behaviour suggests that people do increase their retirement age as they get closer to it, so raising eligibility age could be a signal for earlier and more realistic planning (quite apart from a higher eligibility age prompting later retirement itself).

Some suggestions for what can be done to increase awareness of the facts on and implications of longer lifespans follow:

- **Consistent use of cohort life expectancy indicators by all agencies communicating on retirement planning and related issues**, including government agencies, policy makers, financial planners and journalists. Statistics New Zealand has a simple calculator called "How long will I live?"[50] that gives individualised projections. This is a great start and it could be developed to be used more widely and conveniently.

- **Avoid over-complication of the uncertainty involved in projections**. The "How long will I live?" calculator shows three results using low, medium and high death rates, the implications of which could be explained and the user helped to make an appropriate choice depending on his or her purpose. However, the helpfulness of doing so may be undermined if it appears too complex. Using cohort indicators correctly should help with a large part of why people underestimate their likely lifespans, and only using the median projection will be an improvement in planning quality over no planning at all.

- **Encourage evidence-based public debate about eligibility age**. By not having such a debate, there is little reason for lifespan information to be explained or discussed. If people better understand "we are all living longer" the rationale for raising age of eligibility may become easier to bear. Conversely, raising age of eligibility is likely to help reinforce the message of longer lives which may encourage people to consider their own life planning beyond the implications of New Zealand Superannuation.

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[47] Shkolnikov et al. (2011)

[48] Mathewson (7 March 2013)

[49] For example, see O'Connell (2010), using data from the ANZ–Retirement Commission Financial Knowledge Survey 2009

[50] Statistics New Zealand (2012a)

An advantage of a schedule which aims to maintain the proportion of adult life spent receiving NZS is that the length of time spent on NZS stays roughly constant, as Figure 7 shows. This means that, given the schedule of eligibility ages illustrated here*, a key message can be stated very simply: "the average length of time you should expect to receive NZS is around 23 years for a man and 25 years for a woman"*. Together with the schedule of expected eligibility ages by cohort, this gives the information needed for savings and retirement planning.

Although the schedule might change, albeit with a notice period, the expected average length of time on NZS would remain roughly constant. This key message can therefore be expected to be able to be broadly maintained over time, whereas expected average lifespans have to be updated every time new projections are made. The schedule and review approach therefore uses correct cohort indicators yet still enables a simple headline to be repeated over time, which should help it to be memorable.

Appendix: Longevity data on alternative projection scenarios

The following tables repeat the analysis in Tables 1-3 of Section 1 for different projection scenarios. The "High life expectancy" scenario uses Statistics New Zealand's 95th percentile projection, and the "Low life expectancy" scenario uses the 5th percentile projection.

Table A. 1: Number expected to live to age 65, 67 and 70 from 1,000 20-year-olds of each cohort, low life expectancy scenario

Year of birth	1928	1938	1948	1958	1968	1978	1988
Year age 65	1993	2003	2013	2023	2033	2043	2053
Age in 2013	85	75	65	55	45	35	25
Male							
To age 65	771	817	862	880	899	922	933
To age 67	739	794	842	864	886	911	923
To age 70	681	755	808	836	862	890	906
Female							
To age 65	853	873	904	919	934	947	955
To age 67	833	857	890	908	926	940	949
To age 70	795	827	866	889	910	927	938

Table A. 2: Number expected to live to age 65, 67 and 70 from 1,000 20-year-olds of each cohort, high life expectancy scenario

Year of birth	1928	1938	1948	1958	1968	1978	1988
Year age 65	1993	2003	2013	2023	2033	2043	2053
Age in 2013	85	75	65	55	45	35	25
Male							
To age 65	771	817	864	889	912	939	953
To age 67	739	794	847	876	903	932	948
To age 70	681	755	817	853	886	919	939
Female							
To age 65	853	873	905	925	944	958	969
To age 67	833	857	893	916	937	954	965
To age 70	795	827	873	901	926	946	960

Table A. 3: Cohort life expectancy at age 65: total lifespan and lifespan after age 65, low life expectancy scenario

Year of birth	1928	1938	1948	1958	1968	1978	1988
Age in 2013	85	75	65	55	45	35	25
Male	82.1	84.0	85.0	85.9	86.6	87.4	88.0
Female	85.3	86.6	87.6	88.4	89.1	89.7	90.3
Lifespan from age 65							
Male	17.1	19.0	20.0	20.9	21.6	22.4	23.0
Female	20.3	21.6	22.6	23.4	24.1	24.7	25.3

Table A. 4: Changes in life-course for selected cohorts: additional years of life after age 65 and proportion of adult life spent over age 65, low life expectancy scenario

Year of birth	1928	1938	1948	1958	1968	1978	1988
Age in 2013	85	75	65	55	45	35	25
Additional years of life after age 65 compared to cohort aged 65 in 2013							
Male	-2.9	-1.0	0.0	0.9	1.6	2.4	3.0
Female	-2.3	-1.0	0.0	0.8	1.5	2.1	2.7
Proportion of adult life (20+) aged 65+							
Male	27.5%	29.7%	30.8%	31.7%	32.4%	33.2%	33.8%
Female	31.1%	32.4%	33.4%	34.2%	34.9%	35.4%	36.0%

Table A. 5: Cohort life expectancy at age 65: total lifespan and lifespan after age 65, high life expectancy scenario

Year of birth	1928	1938	1948	1958	1968	1978	1988
Age in 2013	85	75	65	55	45	35	25
Male	82.2	84.7	86.5	88.4	90.1	91.6	93.1
Female	85.5	87.3	89.0	90.7	92.2	93.6	95.0
Lifespan from age 65							
Male	17.2	19.7	21.5	23.4	25.1	26.6	28.1
Female	20.5	22.3	24.0	25.7	27.2	28.6	30.0

Table A. 6: Changes in life-course for selected cohorts: additional years of life after age 65 and proportion of adult life spent over age 65, high life expectancy scenario

Year of birth	1928	1938	1948	1958	1968	1978	1988
Age in 2013	85	75	65	55	45	35	25
Additional years of life after age 65 compared to cohort aged 65 in 2013							
Male	-4.3	-1.8	0.0	1.9	3.6	5.1	6.6
Female	-3.5	-1.7	0.0	1.7	3.2	4.6	6.0
Proportion of adult life (20+) aged 65+							
Male	27.7%	30.4%	32.3%	34.2%	35.8%	37.2%	38.4%
Female	31.3%	33.1%	34.8%	36.4%	37.7%	38.9%	40.0%

Glossary

Longevity is a general term indicating long life. The trend of interest in this paper is increasing longevity: more people living longer lives than ever before.

Lifespan measures how long an individual has lived or might live. It is equal to age at death. If applied to a population it requires a further description, for example:

- The average lifespan expected for female New Zealanders aged 65 in 2013 is 88 years[51].
- The maximum verified lifespan for humans is 122 years[52].

Life expectancy does not always mean the lifespan which anyone should expect, despite sounding as though it should mean this.

- *Period* **life expectancy** is the most common form of life expectancy. It means: "the average length of life remaining at a given age, assuming people experience the age-specific death rates of a given period from the given age onwards. For example, life expectancy at birth for the period 2005–07 is based on death rates in that period, and takes no account of changes in death rates after that period."[53] Period life expectancy is a useful summary comparison of mortality between populations at a point in time.
- *Cohort* **life expectancy** is a better indicator of potential lifespan. It means: "the average length of life remaining at a given age, experienced by people born in the same year. For example, life expectancy at birth for people born in 1900 is based on death rates experienced by those people at each age throughout their life." [54]

Cohort life expectancy is the better indicator of likely lifespan for an individual because it takes into account how death rates change over time - that is, throughout life - rather than assuming death rates are frozen in one period. **Statistics New Zealand now publishes future cohort life expectancies and these figures are used in this paper.**

Cohort life expectancy is known when everyone from that cohort is dead. Cohort life expectancy for cohorts that are still alive is partly known, but the change in death rates in future has to be estimated. Statistics New Zealand makes these estimates for their cohort life expectancy figures and shows a range of results which indicate future uncertainty. This paper firstly uses the median (50th percentile) of Statistics New Zealand's projections and then illustrates projections based on assumptions of higher and lower future death rates[55].

For some analyses, this paper shows data for successive cohorts born ten years apart. These demonstration cohorts relate to people born in 1928, 1938 and so on to 1988. The cohort born in

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[51] Statistics New Zealand (2012a)

[52] Robine and Allard (1999)

[53] Statistics New Zealand (2012b)

[54] Statistics New Zealand (2012b). For more explanation of period and cohort life expectancy, see O'Connell (2011).

[55] For the median projection, there is an estimated 50 per cent chance that the actual result will be higher and 50 per cent that the result will be lower.

1948 reach age 65 in 2013 and serve as a benchmark cohort for New Zealand Superannuation as it is today. This cohort is referred to as **"today's new superannuitants"**. The two previous cohorts are now aged 75 and 85 so demonstrate current older superannuitants. The younger cohorts now aged 55, 45, 35 and 25 years show the expected longevity experience of current adult New Zealanders who will feel the impact of any change to superannuation.

Age of eligibility for New Zealand Superannuation is the age at which NZS becomes payable; currently 65 for both men and women. The generic term **pension age** is also used, meaning the eligibility age for any public pension in any country.

Retirement age is the age at which people retire from full-time paid work. In New Zealand this is not formally linked to age of eligibility in any way, unless an individual chooses to retire on his or her 65th birthday. In other countries, some public pensions are paid only to people who have stopped work and if so, then pension age is the same as retirement age. Unfortunately, retirement age is sometimes used incorrectly to mean pension age or age of eligibility. Retirement age or working at older ages are not considered in this paper.

A policy to allow taking New Zealand Superannuation before eligibility age at a reduced rate, and deferring it for a higher rate, is not relevant to the subject of this paper. Such a policy does not address either longer lives or fiscal pressures. The policy requires a standard eligibility age from which to accelerate or defer NZS payment. The arguments in this paper for eligibility age apply to this standard age.

Healthy life expectancy is a generic term for indicators of the amount of life expectancy that is expected to be free from specified levels of disability or illness. Healthy life expectancy is considered in Section 2.

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