HOUSING

THE NEED TO BUILD

The demographic drivers of housing demand

Leonard Hong

THE NEW ZEALAND INITIATIVE

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About the New Zealand Initiative

The New Zealand Initiative is an independent public policy think tank supported by chief executives of New Zealand businesses. We believe in evidence-based policy and are committed to developing policies that work for all New Zealanders.

Our mission is to help build a better, stronger New Zealand. We are taking the initiative to promote a prosperous, free and fair society with a competitive, open and dynamic economy. We are developing and contributing bold ideas that will have a profound, positive and long-term impact.

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Contents

Figures

Tables

Foreword

Demographic change is a most powerful but barely noticeable socioeconomic process mainly because it is slow to occur and is spread over decades, if not centuries. For instance, if the median age increases by a month or two, statisticians are the only ones likely to notice.

Population ageing does not make society look much different one year to the next. Nor does it change the look and feel of our towns and cities. However, small changes every year can have substantial impacts if they keep happening over long periods.

I have seen this happen in Germany, where I was born in 1975. The median age for men that year was 33.2 years and 37.7 years for women. Today, it is 44.1 years and 47.6 years, respectively.

A median age roughly a decade higher is detectable with the naked eye. Germany today has fewer children and young families but way more elderly people. Fewer schools but more care homes. Fewer TV commercials selling sweets and toys and more peddling prescription-free drugs and stair-lifts.

Demographic ageing also leads to policy challenges. I stumbled upon one in 2005 while researching international housing policy for Policy Exchange in London.

A city planner I interviewed on a field trip to Germany said many cities in his region had to keep building new homes due to the changing composition and needs of households even as population figures stagnated. Demographic change had reduced household sizes. Only 27.6% of all German households were single-person in 1975 compared with 42.3% in 2020.

Since Germany's re-unification in 1990, population has lingered at around 82 million, but the number of households increased from 35 million to just under 42 million in 2020.

These worrying developments in Germany are New Zealand's demographic future, as my colleague Leonard Hong warns in this report.

New Zealand is a much younger country with a much younger population. The last time Germany was as young as New Zealand is today was in the mid-1980s.

And it is not just Germany. Similar household demographic changes are occurring in all the developed economies Leonard has analysed.

He unequivocally shows that New Zealand will need a lot more dwellings to meet its housing demand. The only question is the extent of the shortfall if we do not substantially increase building now.

Leonard also reminds us that demographic changes are usually beyond government control. Government cannot make us live longer (or otherwise). It cannot make us have more children (though authoritarian regimes have reduced fertility rates). Government would struggle to fine-tune net migration figures even if it tried.

For these reasons, we would be wise to treat our challenging demographic future as a given and use the resources we have to prepare for it. Tomorrow will be here before we know it.

If so, and if the housing effects of demographic change internationally are true, then New Zealand is sitting on a brick-and-mortar timebomb. Our country's future housing needs

are set to multiply much faster than the number of houses we have been building every year in the past four decades.

If New Zealand politicians thought the housing crisis in 2020 was bad, they ain't seen nothing yet. Demographic changes will make it worse in the decades to come.

The title of this report is a clarion call to all New Zealanders. We urgently "need to build" starting now.

Dr Oliver Hartwich
Executive Director
The New Zealand Initiative

Executive Summary

The political 'buck passing' of the responsibility for unaffordable housing by successive governments in New Zealand has created extremely expensive housing markets in cities such as Auckland and Wellington[1] – and a national housing crisis. Auckland is the sixth least affordable city among 92 major global housing markets, according to the 2020 Demographia housing survey.[2] The real price of housing in New Zealand increased by 171% from 2000 to 2019, compared with just 11% in Germany in the same period.[3] Despite former Housing Minister Phil Twyford's reforms, the government has prioritised supressing demand and targeting financial speculation from overseas. Demand-side solutions are just tinkering at the edges of the problem. Long-term demographic transformations and changing household sizes are affecting overall housing demand. Inflexible housing development is the core problem, and only freeing up enough supply can solve our housing unaffordability and overcrowding.

The projections in this report show that our housing problems are set to worsen. From 2019 to 2038, the annual average additional dwellings needed will increase from 26,246 ('low' migration and 'low' fertility) to 34,556 ('medium' migration and 'high' fertility). From 2019 to 2060, we will need 15,319 ('low' migration and 'low' fertility) and 29,052 ('medium' migration and 'high' fertility) additional dwellings annually. These figures do not take into account the annual demolition and replacement rate of dwellings and the current undersupply of 40,000. Since 1992, New Zealand has added only 21,445 net private dwellings annually to the housing stock. We are simply *not building enough* to meet the looming demographic changes and demands.

Our housing needs are also set to rise much faster than population growth. The average annual number of dwellings needed based on *just* projected population growth, excluding the smaller household size, was between 5,452 ('low' migration and 'low' fertility) and 21,543 ('medium' migration and 'high' fertility) to 2060 in our analysis. The difference represents an annual shortfall of 9,867 dwellings for the former and 7,509 for the latter (or 64% and 26%, respectively). This means housing policy using only *projected* population growth will markedly underestimate future demand.

Covid-19 and the Reserve Bank of New Zealand's monetary response to the ongoing recession has led to much financial capital flowing into the housing market. Consequently, the national house price average reached $725,000, an increase of 19.8% from October 2019 to October 2020.[4] Low interest rates created incentives for greater borrowing and investments in real assets such as financial stocks and housing. However, if sound institutional arrangements were established and growing supply could meet growing demand, there would be far fewer speculative incentives.

Local councils and Statistics New Zealand already factor demographic changes in their household and dwelling projections, but the effect of the average household size on housing demand is rarely discussed in the public sphere. The aggregate housing demand is based not just on population growth, but also the composition of each household. With household sizes shrinking, fewer people living with many children, and population ageing, we have 'empty nests' and 'crowded houses'.[5]

For this report, we calculated long-term population numbers using the demographic software Spectrum. Based on three fundamental factors – net migration, total fertility, and life expectancy – 36 scenarios were projected to 2060 (and 2038 for dwelling projections). In 33 out of the 36 scenarios, New Zealand's population in 2060 will be larger than it is today. Under all 36 scenarios, the median age will be higher. The 36 scenarios were further narrowed to the six most plausible based on New Zealand's recent demographic history. Among the six, the variation in median age and population size by 2060 was vast – the projected population ranged between 5.55 million and 7.26 million, while the median age was between 41.0 and 48.5 years. Even if migration is low (say, 14,000 per annum), New Zealand's population will still grow substantially over the next few decades.

The current housing crisis is just the tip of the iceberg – if the government does not change course, future generations will face abysmal housing affordability prospects. Stopping migration completely would only produce new problems while doing little to fix the housing problem.

Demographic changes also have long-term implications for fiscal prudence. Under the six most plausible Spectrum scenarios, the dependency rate rose with population ageing, and the number of those over 65 years by at least 23% by 2060. This will result in fewer future taxpayers and more demands on working-age New Zealanders to fund public services such as healthcare and pensions.

Policymakers need to make our economic institutions more versatile so New Zealand can cope with any combination of demographic or household scenarios in the future. New Zealand had net zero migration in 2020 due to Covid-19 related border closures but this did not stop housing inflation. Politicians should stop blaming the housing crisis on migration, land banking investment, and speculation, and instead find policy solutions to free up urban development and housing supply. Faster productivity growth too would help fund additional public services in the long term. Building now and fast is imperative for the nation's future economic and social wellbeing.

Introduction

Housing policy in New Zealand tends to focus on the *Resource Management Act*, high construction costs, foreign investment regulations, and adverse local government incentives. At the same time, housing supply has failed to keep pace with rising demand. Population growth is a driver of demand, but not the only one. This report highlights the potential contribution of population ageing to housing demand. Across the OECD and the developed world, the median age has risen and the number of persons per household has dropped significantly in the past 50 years. New Zealand is no exception.

New Zealand's population is increasing and ageing. Our median age increased from 28.2 to 37.2 years from 1981 to 2018, while the average household size dropped from 3.1 to 2.6 during the same period.[6] An ageing population, increasing life expectancy, rising living standards, and changing socio-cultural norms have transformed household compositions and created 'empty nests and crowded houses'. 'Empty nests' comprise one to two people, usually older parents with adult children who have left the nest. With less downsizing by older Kiwis, and with less housing available for new arrivals, we are facing serious overcrowding in cities, especially in Auckland. With a national median multiple of 7.0 New Zealand's housing market is well above the 'Severely Unaffordable' median multiple, stipulated as 5.1 and over by Demographia.[7]

Covid-19 and the new global recession shut down construction and urban development during the eight-week lockdown in New Zealand in 2020. Despite net migration remaining at nearly zero (see Figure 2), house prices still rose by 20%. But these short-run housing challenges are only a prequel to the ongoing shortfall of 40,000 houses – not to mention the annual rate of dwelling demolition, housing replacement, and the rising housing demand in the long term. This report uses demographic projections to estimate housing demand; consider long-run implications on the housing market; and point out economic effects – beyond housing – on healthcare, tax policy, etc. Demographic trends help project population size and household composition, size and demand in New Zealand in 2038 – and even 2060. The report's structure is set out as follows:

Chapter 1 covers the methodology, technical aspects, and caveats – and also explains how demographic and dwelling projections were calculated for Chapters 2 and 3 through fixed assumptions on fertility, migration flows, and life expectancy. Other sector-specific terminologies and assumptions such as age-specific fertility rates and distribution of net migrants are also explained. Readers may skip this chapter if they wish to go straight to the results.

Chapter 2 illustrates the demographic results gained from the Spectrum software and projects New Zealand's demographic composition (size and median age) for 2038 and 2060 with 36 central projections for both years based on data analysis. Projections are in the form of 'low', 'medium' and 'high' scenarios separately for fertility, net annual migration, and life expectancy.[8]

Chapter 3 covers how demographic ageing contributes to *additional increases* in housing demand on top of population growth. We tested whether cutting migration substantially – or even entirely to net zero – would remove the need to build lots of houses. Demographic data from both Spectrum and Statistics New Zealand

(SNZ) was used to estimate household size and the number of dwellings needed to be built every year by 2038 and 2060 based on several assumptions; the number of households was also projected based solely on population growth trends.

Chapter 4 reviews both the qualitative research and analysis of demographic implications on the housing market, and the changes to household size and composition. International and domestic papers exploring the correlation between unaffordable housing markets and the declining fertility rates of the local population are reviewed, too.

Chapter 5 covers New Zealand's housing public policy within the political and economic spheres. Of significance is how the past few governments have tried to curb demand growth rather than allow housing supply to match demand.

Chapter 6 explores the long-term implications for fiscal prudence of the likely demographic changes such as increased longevity and demographic ageing. Demographic changes affect other policy areas besides housing. Using the six most plausible median life expectancy scenarios in Spectrum, we projected the dependency ratios and proportion of Kiwis older than 65 for 2060.

The **Conclusion** covers the long-run implications for public policy for both housing and fiscal prudence.

CHAPTER 1

Data analysis and methodology

Demographic software Spectrum

We used the DemPro (Demographic Projection) module of demographic modelling software Spectrum to portray the future population of New Zealand by size and age. The software is mainly used to project outcomes for epidemics, demography, family planning, and healthcare, among others. Spectrum was developed by the Futures Institute with the support of USAID, the Bill and Melinda Gates Foundation, the United States Fund for UNICED, UNAIDS, the World Health Organization (WHO), and UNICEF.

Methodology

Using Spectrum, we calculated 36 different scenarios for a range of fertility rates, migration patterns, and life expectancies for 2060. Spectrum requires a base population figure to initiate its projections. We used the total population of 4,966,580 (2,445,170 males and 2,521,410 females) in December 2019 from SNZ. For 2020 and 2021, the numbers were changed to reflect the effects of Covid-19 (see Box 1).

The 36 scenarios include less plausible projections. We narrowed the 36 scenarios to the 'six most plausible' based on New Zealand's comparable previous net migration flows (see Figure 1), and SNZ's median life expectancy. These are the six most plausible projections referred to throughout the report.

Spectrum projected the median age and total population for 2060 (Chapter 2) – and 2038; average household size and total private dwellings (Chapter 3); the dependency rate; and the ratio of people over 65 years (Chapter 6). Further details on the three input factors used in Spectrum's projections – total fertility rate, migration patterns, and life expectancy – are in the following sections. The explanations for the six scenarios culled from the 36 are in the sections below titled "Migration: Four scenarios" and "Longevity: Three scenarios".

Fertility: Three scenarios

The total fertility rate in New Zealand was 1.73 in 2019 and 1.63 in 2020.[9] Both are far below the replacement rate of 2.1 needed in developed economies to keep the population stable without migration flows.[10] For our projections from 2021 to 2060, we used the 'medium' fertility of 1.74 – the rate for 2019.

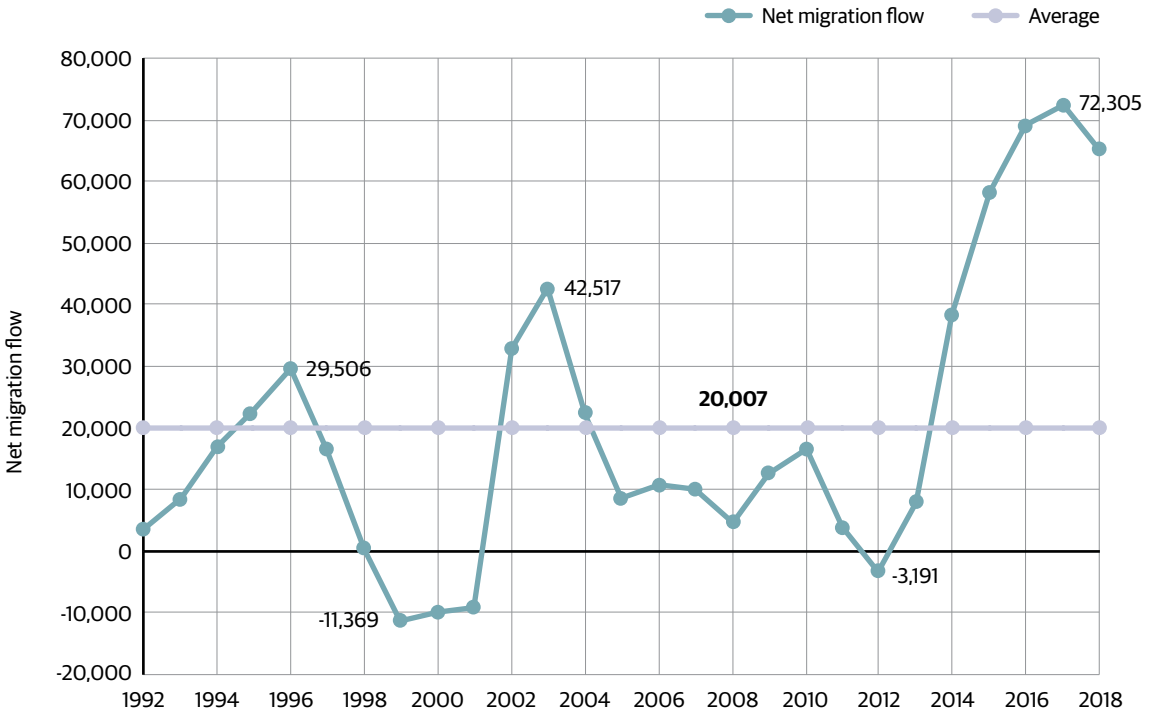
The 'high' fertility scenario assumed that fertility would rise to 2.1. OECD countries, on average, had a total fertility rate of 1.66 in 2019.[11]

The 'low' fertility scenario assumed 1.5 births per woman, which is significantly lower than the replacement rate. This means population will shrink over time without modest net migration. This is a common scenario in EU countries such as Italy (1.4) and East Asian countries such as Japan (1.3). Although this scenario is unlikely for New Zealand in the short run, we need to explore the potential demographic repercussions of 'low' fertility.

Migration: Four scenarios

The annual projections for alternative net migration scenarios ('medium', 'high' and 'low') were constant between 2022 and 2060. For the years 2019, 2020 and 2021, the net migration numbers reflected Treasury's changed projections for PREFU 2020 because of Covid-19's effects on New Zealand's fiscal and economic prospects.[12] Treasury expects international travel restrictions to be lifted around 2022 globally, and projects

Figure 1: Permanent and long-term net migration (Annual–June)



Source: Infoshare, "Table: Permanent & long-term migration by city of residence, citizenship and birthplace (Annual-Jun)," Path: Tourism – International Travel and Migration – ITM, Website, http://infoshare.stats.govt.nz/ViewTable.aspx?pxID=e1a99b00-4483-4c5b-acb6-06b562aaf867.

net migration to gradually increase to 35,000 by June 2024.[13]

The baseline or 'medium' scenario assumed total net migration of 28,000 people per year. This was above the average permanent long-term net migration of 20,007 since 1992 (see Figure 1).

The 'high' scenario assumed an annual net migration of 42,000. This may occur if New Zealand continues to encourage high-level immigration after the end of Covid-19.[14] Migration does have short-term shocks on congestion, housing, infrastructure, healthcare, and other public goods. But as Eric Crampton notes, appropriate infrastructure pricing, including congestion charges, can prevent these shocks from turning into housing and infrastructure shortages.[15]

'Low' migration assumed net migration of 14,000, which was slightly lower than what Labour campaigned on in 2017.[16] Former Deputy Prime Minister Winston Peters advocated net migration of 10,000.[17]

The permanent long-term net migration range annually was between -11,369 and 72,305 from 1992 to 2018. The average for the past 26 years was 20,007 (see Figure 1). The factors that typically determine migration trends and patterns cannot be ignored. Just after the global financial crisis, net migration dropped below 10,000 in 2008 and below zero in 2012 (see Figure 1). But when the global economy began to recover, net migration rose quickly beginning in 2013 and peaked at 72,305 in 2017. Net migration flows tend to vary with booms and recessions.

Finally, 'zero' migration assumed no net migration – the status quo under Covid-19. Normally, this would be implausible in today's

globalised world. New Zealand also is different from most other countries – except for the open interstates in the United States and the Schengen Area in the European Union – because of the open Trans-Tasman border with Australia (under normal circumstances). In 2015, the highest net number of people returned or moved from Australia to New Zealand after the global financial crisis.[18] The 'zero' projections let us examine whether population and housing demand will grow even in the absence of immigration. Chapter 3 explores the significance of migration levels for household projections.

Longevity: Three scenarios

Spectrum interpolated annual life expectancies between 2019 and 2061. It used the 2019 life expectancy of 80.5 years for males and 83.9 years for women.[19] For 2061, it used SNZ's estimates (see Table 1).

Life expectancy is expected to increase under all three scenarios ('low', 'medium' and 'high') based on SNZ projections (see Table 1).[20] 'Medium' life expectancy was chosen as the main scenario for the six most plausible projections.

Table 1: Projected life expectancy in New Zealand (2061)

	Males	Females
Low	82.6 years	86.2 years
Medium	85.6 years	88.7 years
High	88.6 years	91.2 years

Source: Statistics New Zealand.

These projections do not consider annual variability and other complexities.

Other assumptions

Age-specific fertility rates, or the ages at which women give birth, were presumed to remain constant at 2019 levels (see Table 2). Increasingly, more women are giving birth at an older age.

Table 2: Fertility distribution by age groups (2019)

Age (years)	Percent
15–19	3.66%
20–24	14.72%
25–29	26.15%
30–34	32.43%
35–39	18.72%
40–44	4.24%

Source: Statistics New Zealand, "Births and deaths: Year ended December 2019," Website.

The median age of a mother at the time of childbirth increased from 25.7 years in 1980 to 30.5 years in 2018.[21] This trend will likely continue (there is the biological clock, though). The effects of the age at which women give birth was insignificant at best in our modelling.

The sex ratio at birth was assumed to be constant at 105.5 boys for every 100 girls. This is a long-term pattern in New Zealand and there was no reason to change this statistic.[22]

The age distribution of net migrants was assumed to be the same as those of incoming migrants. Neither SNZ nor Treasury provides data on the age profiles of net migrants.

The sex ratio of net migrants for 2018 according to SNZ was 50.37% for males and 49.63% for females.[23] This remained constant across all Spectrum scenarios and projections.

Age-specific mortality rates were based on the Coale-Demeny West life tables, which provide mortality rates for life expectancies in five-year periods up to 80 years.

Caveats

Future demographic trends, government policies, and technological and medical advances are unknown. Models and projections can give broad indications but cannot accurately predict

outcomes. Migration trends vary based on exogenous factors. Migrants could be young and come from nations with a higher fertility rate. Fertility itself cannot be controlled centrally by politicians or bureaucrats unless the government is authoritarian, like China and its one-child policy. Life expectancy is largely outside government control; it is mainly determined by lifestyle choices and medical and technological advances.

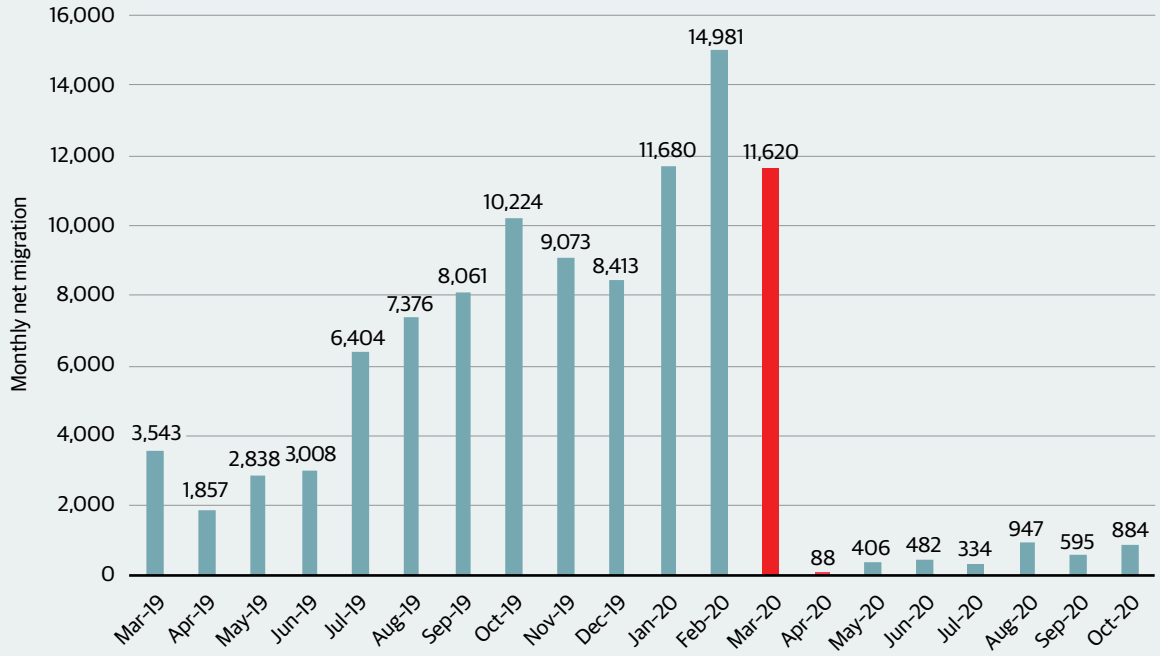
Therefore, each step in using population and median age projections to project household numbers and needed additional dwellings is subject to some error. The statistical regression used in this report to convert median population age projections to average household size projections is also subject to considerable error. So are the assumptions that the proportions of households to dwellings and of people in households to the total population in December 2019 will be unchanged to 2060.

Box 1: Incorporating the effects of Covid-19 on our demography

The ongoing economic recession and global pandemic have increased demographic projection uncertainty. The closed border reduced monthly net migration from 11,620 in March 2020 to 88 in April 2020 (see red bars in Figure 2).[24] Immigration has been constantly below 1,000 since then. The pandemic stopped international travel completely, and the increasing net migration that began in 2012 also ceased (see Figure 1).

We fed Treasury's figures for net migration (79,500 for 2020 and 5,000 for 2021)[25] into Spectrum allowing for the disruption to migration in 2020[26] – and assumed the border would stay closed until 1 January 2022[27] unless a vaccine becomes available,[28] Covid-19 is effectively contained, and the global economy stabilises.[29] According to Harvard's T.H. Chan School of Public Health, the world will maintain social distancing measures up to 2022 until critical healthcare capacity increases.[30]

Figure 2: Estimated monthly net migration (March 2019 to October 2020)



Source: Statistics New Zealand, "International migration: October 2020," Website.
Note: The red bars are explained in Box 1.

Deriving dwelling and household projections from Spectrum's population projections

SNZ defines 'dwellings' as "buildings designed and intended for private accommodation, such as detached houses, townhouses, and apartments."[31] It defines 'households' as "either one person who usually resides alone, or two or more people who usually reside together and share facilities (such as for eating, cooking, or a living area; and bathroom and toilet) in a private dwelling."[32] Non-private dwellings consist of accommodation such as motels, hotels, institutions, prisons, student hostels, residential care for old people, and boarding houses.[33]

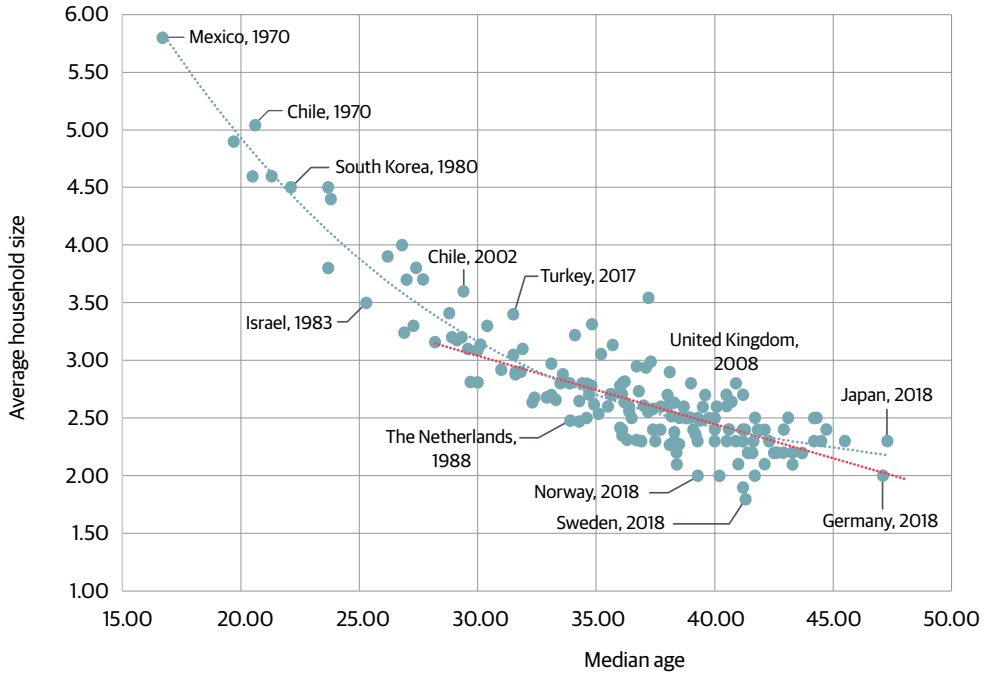
We converted those population projections into household projections for the 36 scenarios in three steps.

1. Scaled down population numbers by multiplying each by the fraction (0.932) of the population living in households in December 2019.[34]
2. Derived estimates for the average household size for each of the 36 scenarios from Spectrum's median age projections using the regression technique described below.
3. Divided the scaled down population projections by the estimated average household size for each of the 36 scenarios. That gave us projections for household numbers to 2038 and 2060 for each of the 36 scenarios.

We also converted household projections into private dwelling projections by multiplying each household projection by the ratio (1.073) of private dwellings (1,911,400) to households (1,781,100) in December 2019.[35] The projected number of households and dwellings varies considerably across the 36 scenarios.

Our regression technique used the inverse empirical relationship between median age

Figure 3: Average household size vs median age in all 36 OECD countries (1970s to 2019)



Source: Various (United Nations, OECD, Eurostat, Statistics New Zealand, The World Bank, etc.).
Note: New Zealand's trendline compared to other OECD countries is shown by the red dotted line.

and average household size across countries and over time. Figure 3 shows this non-linear relationship.

Each dot in Figure 3 represents a country's median age and average household size at a particular year. Except for New Zealand, which has 8 data points, every other country has between 3 and 6 dots from 1970 to 2019. Some of the dots are highlighted as examples: "South Korea, 1980" and "United Kingdom, 2008". All OECD countries, including New Zealand (highlighted in red), experienced smaller household sizes as their populations aged.

The median population age ranged from 16.7 years (Mexico, 1970) to 47.3 years (Japan, 2018). New Zealand's median age in 2019 was 37.4 years. The average household size ranged from 1.8 (Sweden, 2018) to 5.8 (Mexico, 1970). New Zealand's average household size in 2019 was 2.6.

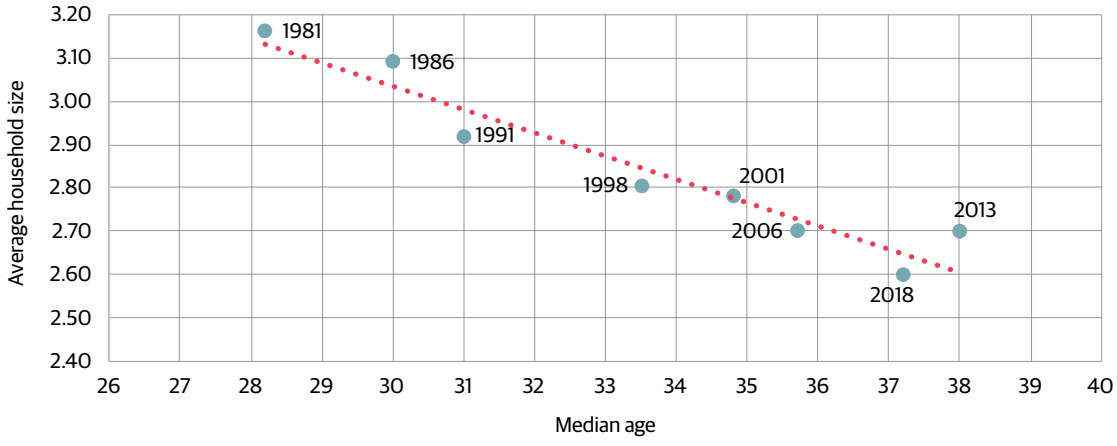
Caveats to household and dwelling projections

We ran a simple pooled cross-sectional regression in the statistical software Stata with country-level fixed effects to generate predicted household sizes for New Zealand for different median ages.[36] We used these forecast household series, in combination with Spectrum's forecast population series and median ages, to forecast the number of households in each scenario.

The household and dwelling projections did not consider income effects. Average household size may also be decreasing as people become richer. Being able to live apart from extended families may be a luxury, but incomes have increased over time. Our projections are conditioned only on median age. If increased income is also driving some of the demand for smaller household sizes, it would affect the number of households forecast. If income growth slows relative to prior trends, then our figures may overestimate the number of households in the future. If income growth increases relative to prior trends, our figures may underestimate the number of future households.

We fed the median age projections (see Table 2 for 2060 and Table 3 for 2038) into Stata's estimated equation to derive the likely corresponding average household size for 2038 and 2060 (see Tables 4 and 6). The total number of households for each of Spectrum's 36 scenarios was calculated by dividing the population of people in households (93.2% of population projections in Table 2 for 2060 and Table 3 for 2038) by the

Figure 4: Average household size vs median age in New Zealand (1981–2018)



Source: Statistics New Zealand Yearbooks and Infoshare.

projected average household size (see Tables 4 and 6). We estimated the total number of dwellings by multiplying projected people in households by 1.073 (see Tables 5 and 7).

Figure 4 is a scatter graph *only* for New Zealand. It plots the historical median age against average household size from 1981 to 2018. The declining average household size and increasing median age are not just international trends but can also be seen in New Zealand. See Table 16 for SNZ historical data (Appendix 1). The linear trendline was not taken into account for the projection as the extrapolation of household changes beyond 2018 is not entirely accurate. Instead, the regression used the 173 OECD data points in Figure 3 with Stata, which provided data input of countries with high median age and low average household size closer to 50 years and 2.0, respectively.

SNZ's Living Arrangement B household projections for 2038 and 2060

Government agencies already consider demographic changes to project future household numbers. SNZ has projected future population and households to 2038 taking population ageing into account. Using these projections, we quantified the potential excess housing demand to 2038, compared with housing shortfall projections based on just population growth (see second half of Chapter 3). We calculated both 2038 shortfalls with SNZ data using gap analysis and 2060 data using extrapolation methods. The comparisons between household and population projections are based on SNZ's Living Arrangement B scenarios (see Appendix 2).[37] We extrapolated SNZ data from "Projected Households by Household Type from 2013–2038" and the "Projected Population by Living Arrangement Type from 2013–2038" to 2060 to calculate the shortfall of households if the number of dwellings only increased to match population growth. SNZ's Case B projections show forward trend changes in household living arrangements between 1986 and 2013.

We compared our forecast household numbers for 2038 in the scenarios that most closely matched SNZ's projections and found they matched reasonably well. We then extended our forecast to 2060, beyond the range of SNZ's projections, and to additional scenarios. Our purpose was not to provide a more accurate forecast than SNZ, but rather to extend the forecast to a greater range of scenarios and over a larger period.

SNZ's 'low', 'medium' and 'high' demographic projections to 2038 align with Spectrum's (see Table 3).

Table 3: Comparison of annual compounded population growth between SNZ and Spectrum to 2038

	SNZ: Projected population by Living Arrangement B, 2013-Base (Annual June)		
Scenarios	Low fertility, high mortality, low migration, and b living arrangement type rates	Medium fertility, medium mortality, medium migration, and b living arrangement type rates	High fertility, low mortality, high migration, and b living arrangement type rates
Annual growth	0.58%	0.82%	1.15%
	Spectrum: Projected population		
Scenarios	Low migration, medium fertility, medium life expectancy	Medium migration, medium fertility, medium life expectancy	High migration, medium fertility, medium life expectancy
Annual growth	0.63%	0.88%	1.12%

Source: Author's calculations.

- SNZ's Case B projected a 0.58% per annum average annual compounded population growth rate to 2038 for its 'low' scenario, 0.82% for 'medium', and 1.15% for 'high'.[38]
- Spectrum's projected average annual compounded rate of increase in population to 2038 was 0.63% per annum for its 'low' immigration scenario, 0.88% for 'medium', and 1.12% for 'high'.
  All figures were based on medium fertility and medium life expectancy assumptions.

SNZ's growth rates of 0.58% to 2038 per annum and 1.15% per annum (see Table 3) represent the population growth rates to the top and bottom ends of its 25% and 75% ranges, respectively, for population in 2038. Expressed differently, there is a 50% chance the projected population will represent an annual average compounded growth rate of between 0.58% and 1.15% per annum from 2019 to 2038.

CHAPTER 2

Demographic projections from Spectrum

The median age of New Zealand's population was 37.4 years in 2020,[39] and the total population was 5.1 million.[40] This is young compared to other developed nations such as Germany (47.1 years) and Japan (47.3 years). Across all 36 scenarios, New Zealand's population in 2060 would *also* be older and larger except in three scenarios (zero migration, low fertility, and all three life expectancies). The intuitive reason for the short-run rise in population under zero migration is that births exceed deaths at the outset. Eventually, deaths exceed births due to the lower fertility rates (see Figure 5).

RESULT 1: New Zealand's population will be larger and older by 2060 under most realistic scenarios.

Spectrum's 36 scenarios for the median age and total population in 2060 are shown in Table 4.

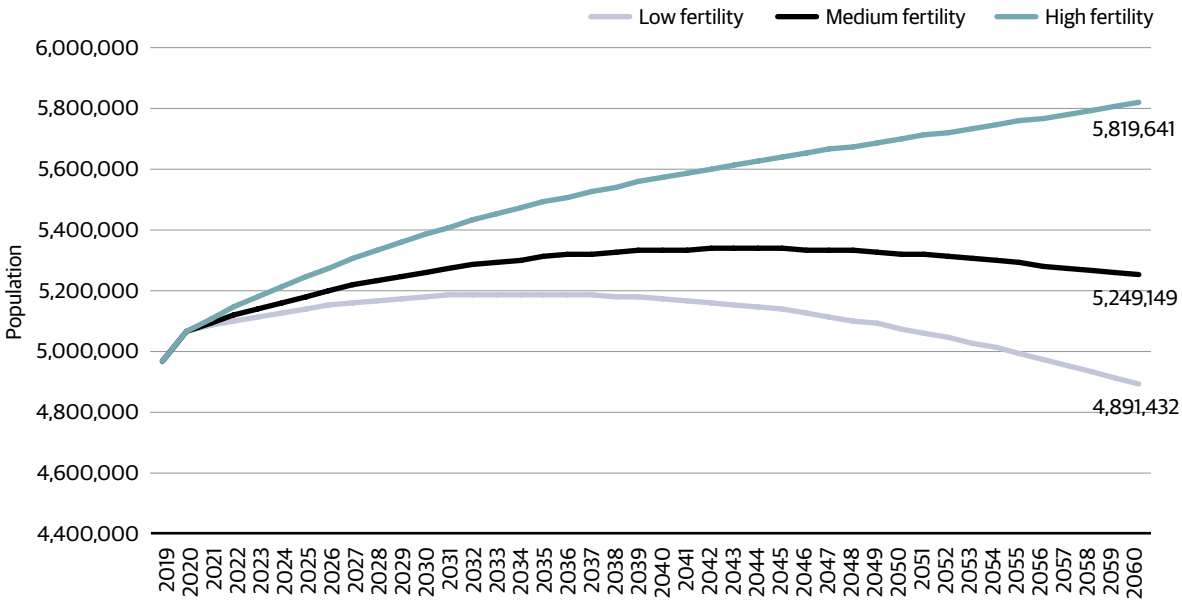
- The 'high' migration, 'high' fertility, and 'low' life expectancy scenario (highlighted in green) resulted in the youngest projected population with a low median age of 39.9 years and a total population of 7.84 million by 2060.
- Under 'zero' migration, 'low' fertility, and 'high' life expectancy, New Zealand will have a high median age of 50.6 years and a population of 5 million in 2060 (highlighted in red).
- The population drops below 5 million by 2060 with 'zero' migration and 'low' fertility for both 'low' and 'medium' life expectancies – 4.78 million and 4.89 million, respectively. This will also result in average median ages of 49.0 and 49.8 years, respectively.

Table 4: Median age and population size under 36 scenarios (2060)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	49	46.3	41.7	49.8	47.1	42.6	50.6	47.9	43.4
(0)	4,777,549	5,134,508	5,703,773	4,891,432	5,249,149	5,819,641	4,999,430	5,357,800	5,929,348
Low migration	47.7	45.2	40.9	48.5	45.9	41.7	49.2	46.6	42.4
(14,000)	5,427,820	5,810,431	6,419,048	5,547,358	5,930,779	6,540,701	5,660,205	6,044,322	6,655,366
Medium migration	46.7	44.3	40.3	47.4	45	41	48	45.6	41.7
(28,000)	6,078,045	6,486,302	7,134,259	6,203,240	6,612,357	7,261,697	6,320,935	6,730,791	7,381,322
High migration	46	43.7	39.9	46.6	44.3	40.6	47.2	44.9	41.2
(42,000)	6,719,309	7,151,745	7,836,794	6,850,237	7,283,580	7,970,087	6,972,817	7,406,941	8,094,701

Source: Author's calculations.

Figure 5: Population under medium life expectancy and zero migration (2019–2060)



Source: Author's calculations.

Assuming the 'medium' life expectancy scenario to be the most realistic, we narrowed the data from the 36 scenarios to 12 (highlighted in grey and yellow, respectively).

Excluding the 'zero' and 'high' migrations, outlier scenarios gave six more plausible scenarios (highlighted in yellow). SNZ recently released its own projections for net migration and deemed 'zero' migration extremely unrealistic.[41] These outlier scenarios are assumed to be below a 25% weighting in SNZ's probability distribution for population size in 2060.

Population grows and then declines under 'low' and 'medium' fertility (see Figure 5). Under all scenarios, births exceed deaths initially. But fertility rates below the replacement rate of 2.1 in conjunction with 'zero' migration eventually see deaths exceeding births. As time passes, the proportion of women who give birth falls – lowering population growth to 2060.

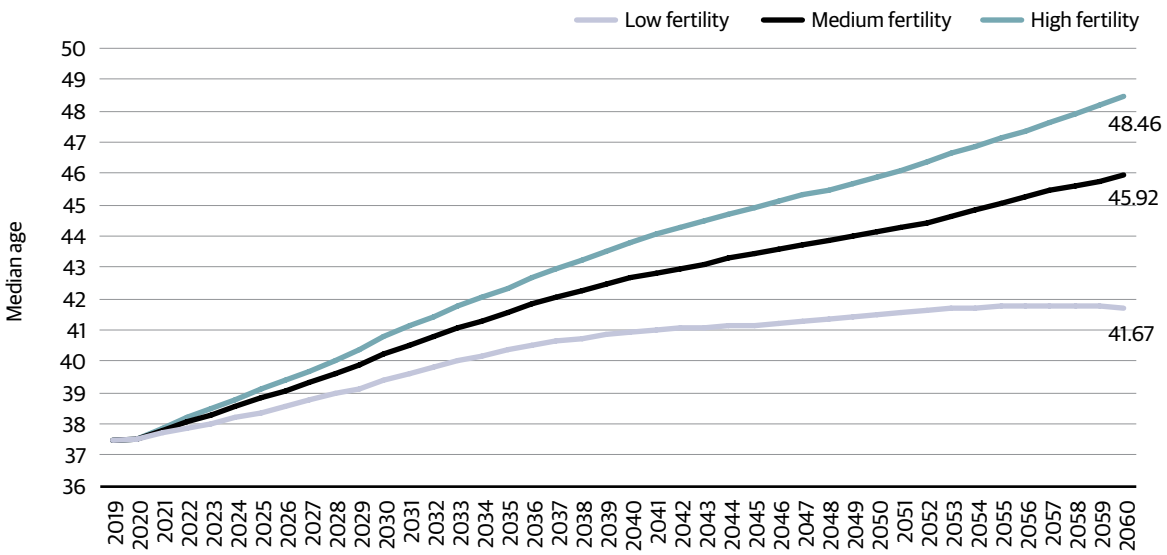
Six most plausible scenarios

The variations between median age and total population by 2060 are vast even for the six most plausible scenarios (see Table 4). The projected population ranges from 5.55 million to 7.26 million, while the median age is between 41.0 and 48.5 years.

If New Zealand's fertility rate drops to 1.5, the median age by 2060 would be considerably higher at 48.5 years at 'low' migration of 14,000, and 47.4 years at 'medium' migration of 28,000 (see Table 4, Figures 6 and 7). 'Low' and 'medium' migration would still steadily raise the median age by 2060.

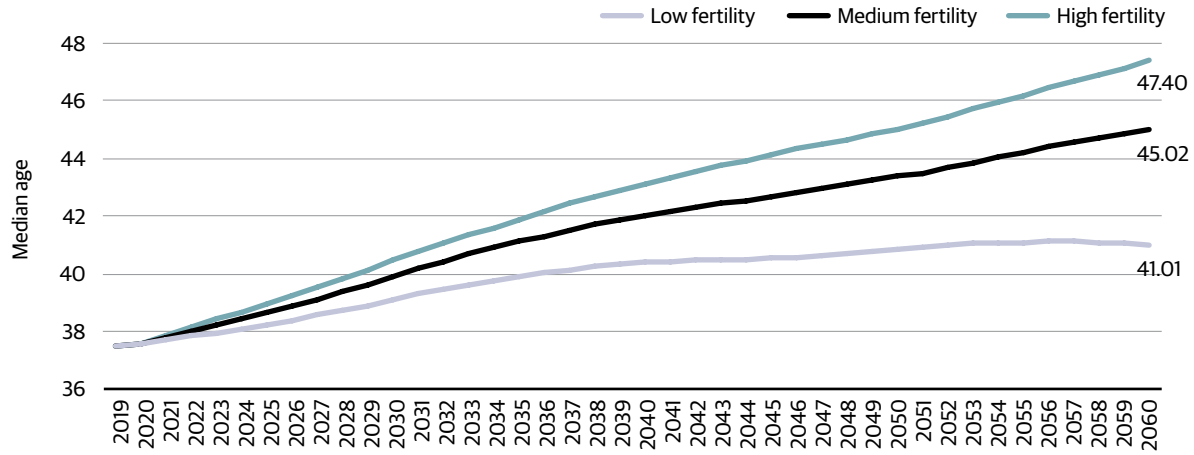
Conversely, a 'high' fertility rate of 2.1 – the replacement rate – would see less ageing, with a median age between 41.0 years and 41.7 years in 2060, regardless of 'low' or 'medium' migration. Fertility has a far more significant impact on the median age than migration does. Population will grow and age in the coming decades, but the *extent* is unknown.

Figure 6: Median age under medium life expectancy and low migration (2019–2060)



Source: Author's calculations.

Figure 7: Median age under medium life expectancy and medium migration (2019–2060)



Source: Author's calculations.

CHAPTER 3

Housing demand based on demographic projections

The first half of this chapter uses Spectrum's demographic projections to estimate 36 scenarios for dwelling numbers and the average household size for both 2038 and 2060 for New Zealand. Average household size falls as the median age increases, as suggested by the regression approach explained in the "Spectrum Household Projection's Technicalities" section in Chapter 1.

Housing demand may increase faster or slower than population growth when demographic composition changes materially. Changes in household composition affect housing demand. For example, Germany's population has been stable at close to 82 million since 1991, but the number of households rose from 35 million in 1990 to 42 million in 2020.[42] The potential for similar trends in New Zealand is explored in this chapter. These projections are net additions for the housing stock. 'Net' shows there will always be replacement needs as houses do not last forever.

Total private dwellings and household size projections for 2038

For 2038, the projected population ranged between 5.2 million for the oldest median age of 44.1 years ('low' fertility, 'zero' migration, and 'high' life expectancy) and 6.3 million for the youngest median age of 39.6 years ('high' fertility, 'high' migration, and 'low' life expectancy) (see Table 5). In contrast to 2060, New Zealand's population grew under every scenario, even with net zero migration.

Table 6 shows the projected household size in New Zealand in 2038 for each of Spectrum's 36 scenarios. The figures were derived by applying

Table 5: Median age and population size under 36 scenarios (2038)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	43.7	42.7	41.1	43.9	42.9	41.3	44.1	43.1	41.5
0	5,150,516	5,294,509	5,510,618	5,181,390	5,325,484	5,541,746	5,212,105	5,356,293	5,572,695
Low migration	43.1	42.1	40.5	43.3	42.2	40.7	43.4	42.4	40.9
(14,000)	5,415,769	5,565,080	5,789,168	5,447,067	5,596,483	5,820,729	5,478,201	5,627,715	5,852,108
Medium migration	42.5	41.5	40.1	42.7	41.7	40.2	42.9	41.9	40.4
(28,000)	5,681,013	5,835,641	6,067,704	5,712,733	5,867,471	6,099,699	5,744,287	5,899,126	6,131,507
High migration	42	41.1	39.6	42.2	41.2	39.8	42.3	41.4	40
(42,000)	5,944,312	6,103,953	6,343,536	5,976,461	6,136,216	6,375,969	6,008,439	6,168,300	6,408,211

Source: Author's calculations.

Spectrum's 2038 median age projection to the fitted regression line based on Figure 3. The projected household size ranges from 2.41 for the youngest median age projection to 2.24 for the oldest. This is broadly similar to SNZ's medium projection for an average household size of 2.4 by 2038.[43] SNZ's "Housing in Aotearoa" report says the recent 'crowding' in major cities due to unaffordable housing reflects the bigger household size of 2.6 in 2018. Approximately 1 in 9 (10.8%) people are living in overcrowded households in New Zealand.[44]

Table 6: Projected average household size under 36 scenarios (2038)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	2.25	2.28	2.34	2.25	2.27	2.33	2.24	2.27	2.32
Low migration	2.27	2.30	2.36	2.26	2.30	2.26	2.26	2.29	2.35
Medium migration	2.29	2.32	2.38	2.28	2.31	2.38	2.27	2.31	2.37
High migration	2.30	2.34	2.41	2.3	2.33	2.4	2.29	2.33	2.39

Source: Author's calculations.

Table 7: Projected needed private dwellings in 2038 and the implied increase from 2019

		Low life expectancy			Medium life expectancy		
Assumptions		Low fertility	Med fertility	High fertility	Low fertility	Med fertility	High fertility
Zero migration	Total dwellings	2,290,065	2,323,858	2,358,524	2,309,131	2,343,922	2,380,027
	Increase	378,665	412,458	447,124	397,731	432,522	468,627
Low migration	Total dwellings	2,390,043	2,421,182	2,451,100	2,410,079	2,438,556	2,473,558
	Increase	478,643	509,782	539,700	498,679	527,156	562,158
Medium migration	Total dwellings	2,486,402	2,514,684	2,549,579	2,507,424	2,536,702	2,567,972
	Increase	575,002	603,284	638,179	596,024	625,302	656,572
High migration	Total dwellings	2,582,183	2,612,470	2,639,142	2,604,124	2,630,830	2,663,343
	Increase	670,783	701,070	727,742	692,724	719,430	751,943

		High life expectancy		
Assumptions		Low fertility	Med fertility	High fertility
Zero migration	Total dwellings	2,327,986	2,363,796	2,401,376
	Increase	416,586	452,396	489,976
Low migration	Total dwellings	2,426,909	2,459,486	2,495,871
	Increase	515,509	548,086	584,471
Medium migration	Total dwellings	2,528,251	2,558,546	2,591,192
	Increase	616,851	647,146	679,792
High migration	Total dwellings	2,621,991	2,653,597	2,687,415
	Increase	710,591	742,197	776,015

Source: Author's calculations.

Table 8: Projected annual increase in private dwellings (2019–2038)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	19,930	21,708	23,533	20,933	22,764	24,665	21,926	23,810	25,788
Low migration	25,192	26,831	28,405	26,246	27,745	29,587	27,132	28,847	30,762
Med migration	30,263	31,752	33,588	31,370	32,911	34,556	32,466	34,060	35,779
High migration	35,304	36,898	38,302	36,459	37,865	39,576	37,400	39,063	40,843

Source: Author's calculations.

In Table 7, the projected total number of private dwellings in 2038 ranged from 2.29 million to 2.69 million (highlighted in blue and brown, respectively). The top row in Table 7 (Total dwellings) shows the overall number of private dwellings based on each scenario; the bottom row (Increase) shows the implied increase in the number of private dwellings (1,911,400) from SNZ's number of dwellings in December 2019. The increase ranged between 378,665 and 776,015 (highlighted in blue and brown in Table 7). Table 11 presents the corresponding projections for 2060.

Even if net migration were zero to 2038, the projected increase in private dwellings ranged from 378,665 households to 489,976 across nine scenarios (see Table 7). That is *still* between **19,930** and **25,788** net dwellings annually from 2018 to 2038 (see Table 8). For example, the projected increase of 378,665 dwellings is for 'zero' migration, 'low' fertility, and 'low' life expectancy. Despite *only* having a population growth of 183,936, cutting migration to zero does little to stop new housing demand.

For the six most plausible scenarios, the increase ranges from 498,679 for 'low' migration and 'low' fertility, to 656,572 for 'medium' migration and 'high' fertility from 2018 to 2038. Between **26,246** and **34,556** net dwellings would be needed annually to accommodate moderate migration, life expectancy and fertility (see Table 8).[45]

Even the 'low' migration scenario would need more than the **21,445** average annual dwelling of increase since 1992 (see Figure 11).

RESULT 2: By 2038, New Zealand would need between 26,246 ('low' migration and 'low' fertility) and 34,556 ('medium' migration and 'high' fertility) dwellings annually, excluding housing replacement rate and the ongoing shortfall.

Total private dwelling projections based on just population growth by 2038

We used New Zealand's average household size of 2.6 in 2019 and Spectrum's population growth figures (excluding all other variables) to estimate the number of dwellings needed by 2038.[46] Across all scenarios, the range was between 3,726 and 29,201 dwellings. The average annual net addition to the housing stock for the six most plausible scenarios was between **9,732** ('low' migration and 'low' fertility) and **22,952** ('medium' migration and 'high' fertility), respectively (see Table 9).

These increases are much small than the projected needed increases of **26,246** and **34,556** net dwellings taking household size into account (see Table 8).

Using population growth alone to project private dwellings to 2038 would underestimate the needed increases by **16,514** dwellings annually for the lower scenario and **11,605** for the higher scenario (annual shortfall percentage of 63% and 34%, respectively).

Table 9: Projected annual increase in private dwellings (2019–2038) (HH size = 2.6)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	3,726	6,642	11,020	4,351	7,270	11,650	4,973	7,894	12,277
Low migration	9,098	12,123	16,662	9,732	12,759	17,301	10,363	13,392	17,937
Medium migration	14,471	17,603	22,304	15,114	18,248	22,952	15,753	18,889	23,596
High migration	19,804	23,038	27,891	20,456	23,691	28,548	21,103	24,341	29,201

Source: Author's calculations.

Total private dwellings and household size projections for 2060

RESULT 3: By 2060, New Zealand would need between 15,319 ('low' migration and 'low' fertility) and 29,052 ('medium' migration and 'high' fertility) dwellings annually, excluding housing replacement rate and ongoing shortfall.

For the 36 Spectrum scenarios, the projected household size in 2060 was between 2.19 and 2.39 (see Table 10). That is a greater range of average, albeit smaller, household sizes than in 2038. Lower fertility reduces household size.

The range is narrower for the six most plausible scenarios: 2.19 to 2.34. This is closer to the low household sizes (1.9 and 2.4) in OECD countries such as Sweden, Denmark, Germany, the United Kingdom, and South Korea.

For the six most plausible scenarios, the projected increase in private dwellings between 2019 and 2060 ranged from 628,095 to 1,191,140 (see Table 11). The annual increase in the stock of dwellings[47] ranged from **15,319** for 'low' migration and 'low' fertility, and **29,052** households for 'medium' migration and 'high' fertility (see Table 12).[48] The large discrepancy highlights the significance of fertility on population and household size projections. Considering the historic 21,445 net annual increase in the dwelling stock, the existing 40,000 shortfall[49] entails an additional two full years of building and construction.

RESULT 4: Cutting migration even to zero does little to stop new housing demand.

Table 11 also shows the need for 275,206 to 715,372 dwellings to 2060 even with 'zero' migration. The projected increase of 715,372 dwellings was for the 'zero' migration, 'high' fertility, and 'high' life expectancy scenario, which would still require building **17,448** net dwellings annually by 2060.

Table 10: Projected average household size under 36 scenarios (2060)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	2.19	2.20	2.31	2.19	2.19	2.28	2.19	2.19	2.26
Low migration	2.19	2.22	2.35	2.19	2.21	2.31	2.19	2.20	2.29
Medium migration	2.20	2.24	2.37	2.19	2.22	2.34	2.19	2.21	2.31
High migration	2.20	2.25	2.39	2.20	2.24	2.36	2.19	2.22	2.33

Source: Author's calculations.

Table 11: Estimated number of private dwellings needed in 2060 and the implied increase from 2019

		Low life expectancy			Medium life expectancy		
Assumptions		Low fertility	Med fertility	High fertility	Low fertility	Med fertility	High fertility
Zero migration	Total Dwellings	2,186,606	2,335,477	2,465,930	2,235,041	2,396,517	2,550,736
	Increase	275,206	424,077	554,530	323,641	485,117	639,336
Low migration	Total HH	2,482,432	2,622,755	2,737,666	2,539,495	2,691,076	2,827,762
	Increase	571,032	711,355	826,266	628,095	779,676	916,362
Medium migration	Total HH	2,770,343	2,903,281	3,009,263	2,834,907	2,979,647	3,102,540
	Increase	858,943	991,881	1,097,863	923,507	1,068,247	1,191,140
High migration	Total HH	3,050,846	3,179,869	3,280,061	3,120,815	3,260,144	3,380,743
	Increase	1,139,446	1,268,469	1,368,661	1,209,415	1,348,744	1,469,343

		High life expectancy		
Assumptions		Low fertility	Med fertility	High fertility
Zero migration	Total Dwellings	2,288,472	2,451,352	2,626,772
	Increase	377,072	539,952	715,372
Low migration	Total HH	2,589,903	2,753,658	2,908,601
	Increase	678,503	842,258	997,201
Medium migration	Total HH	2,892,464	3,047,701	3,191,190
	Increase	981,064	1,136,301	1,279,790
High migration	Total HH	3,184,589	3,334,736	3,470,507
	Increase	1,273,189	1,423,336	1,559,107

Source: Author's calculations

Table 12: Projected annual increase in private dwellings (2019–2060)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	6,712	10,343	13,525	7,894	11,832	15,594	9,197	13,170	17,448
Low migration	13,928	17,350	20,153	15,319	19,016	22,350	16,549	20,543	24,322
Medium migration	20,950	24,192	26,777	22,525	26,055	29,052	23,928	27,715	31,214
High migration	27,791	30,938	33,382	29,498	32,896	35,838	31,053	34,716	38,027

Source: Author's calculations.

Total dwelling projections based on just population growth for 2060

We estimated the annual average number of dwellings needed based on just population growth if New Zealand's average household size stayed 2.6 from 2019.[50] Across all scenarios, the annual range was between -1,774 and 29,363 dwellings. Note the significance of the 'low' fertility, 'zero' migration, and 'low' life expectancy figure of -1,774. We need to be demolishing 1,774 dwellings annually if housing demand were calculated based on just population growth, which is not the case.

The projected average annual net addition to the housing stock for the six most plausible scenarios ranged between **5,452** ('low' migration and 'low' fertility) and **21,543** ('medium' migration and 'high' fertility), respectively (see Table 13).

Table 13: Projected annual increase in private dwellings (2019–2060) (HH size = 2.6)

	Low life expectancy			Medium life expectancy			High life expectancy		
Assumptions	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	-1,774	1,576	6,920	-705	2,652	8,007	308	3,672	9,037
Low migration	4,329	7,921	13,634	5,452	9,051	14,776	6,511	10,116	15,852
Medium migration	10,433	14,265	20,347	11,608	15,448	21,543	12,713	16,560	22,666
High migration	16,452	20,511	26,942	17,681	21,749	28,193	18,832	22,907	29,363

Source: Author's calculations.

For these six scenarios, using only population growth to project annual additional dwellings to 2060 produced underestimations of **9,867** dwellings (15,319 to 5,452) for the lowest dwelling scenario, and **7,509** dwellings (29,052 to 21,543) for the highest (annual shortfall percentage of 64% and 26%, respectively).

Housing shortfall under SNZ's Living Arrangement B scenarios

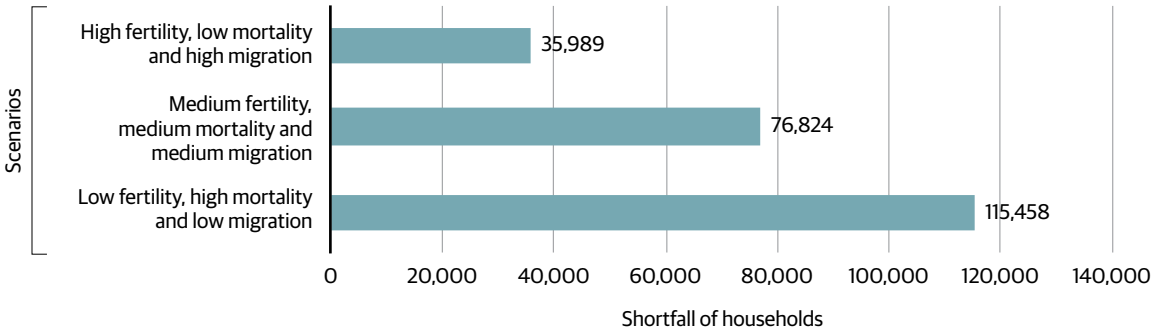
The previous section considered the six plausible scenarios and other less plausible projections from Spectrum to estimate the total private dwellings needed, average household sizes, and additional dwellings necessary to accommodate household changes to 2038 and 2060.

This section compares Spectrum's household projections with SNZ's Living Arrangement B scenarios (Low B, Medium B, and High B). It also supplements Spectrum's household projections and uses SNZ's household projections from 2013 to 2038. We again test whether estimating total household numbers based on just population growth underestimates the number dwellings needed.[51]

Projections to 2038

SNZ projects household numbers to increase much faster than population growth to 2038

Figure 8: Gap analysis for B scenario between projected household numbers (2019 and 2038)



Source: Statistics New Zealand: Population and household projections.
Note: The gap shows the degree to which projected households increase faster than population growth.

under the Living arrangement B scenarios (see Appendix 2). The degree to which they do so depends on each scenario. The gap increases with lower migration, lower fertility, and higher mortality (see Figure 8). The underestimated household supply gap to 2038 ranged from 35,989 to 76,824 to 115,458 depending on the scenario. As a percentage of projected population in each scenario, the gap was 1.6%, 3.5% and 5.6%, respectively. The average household size projected for 2038 was 2.52 for the 'low' scenario, 2.57 for 'medium', and 2.62 for 'high'.[52]

Projections to 2060

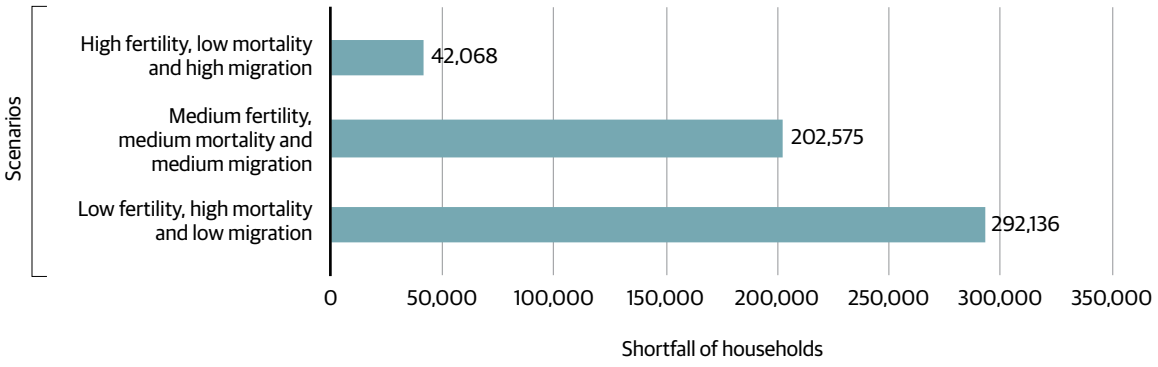
The difference in the gap between 2019 and 2060 for the 'low', 'medium' and 'high' B scenarios ranged from 42,068 to 202,575 to 292,136, respectively (see Figure 9). As a percentage of projected population in each scenario, the corresponding gap was 1.4%, 7.8% and 12.5%, respectively. With higher fertility, lower mortality, and higher migration, the shortfall is far smaller because household size is larger and median age is lower compared to other alternatives. The shortfall is relative to native population. Meanwhile, having lower fertility and lower migration has significant repercussions for additional housing demand despite having a lower population than in the 'medium' and 'high' scenarios. A younger population implies a smaller shortfall, while an older population implies underestimating housing by a far larger scale. The average household size projected for 2060 was 2.36 for the 'low' scenario, 2.47 for 'medium', and 2.63 for 'high'.[53]

Overall housing indicators

For the six most plausible demographic scenarios in Spectrum (highlighted in yellow), **26,246** ('low' migration and 'low' fertility) to **34,556** ('medium' migration and 'high' fertility) additional dwellings would be needed annually to 2038. From 2019 to 2060, New Zealand would need between 15,319 ('low' migration and 'low' fertility) and 29,052 ('medium' migration and 'high' fertility) dwellings annually.[54] The reason for the variation between 2038 and 2060 is explained on p. 20.

For SNZ figures based on the Living Arrangement B scenarios, Figure 10 shows two sets of data for the average annual increase in the number of households from 2019 to 2060. The annual changes for households based on *just* population growth is from **12,061** to **18,051** to **25,856** per annum. SNZ's actual annual projections were **19,186**, **22,992** and **26,882** for 'low', 'medium' and 'high' B scenarios, respectively. In contrast, the average increase in the number of dwellings was **21,445** annually

Figure 9: Gap analysis for B scenario between projected household numbers (2019 and 2060)



Source: Statistics New Zealand: Population and household projections.
Note: Gap analysis was used to extrapolate 2060 data. The three gaps show the degree to which projected number of households increases faster than population growth.

since 1992 (see Figure 11).[55] The number of homes currently being built cannot adequately accommodate projected population growth.

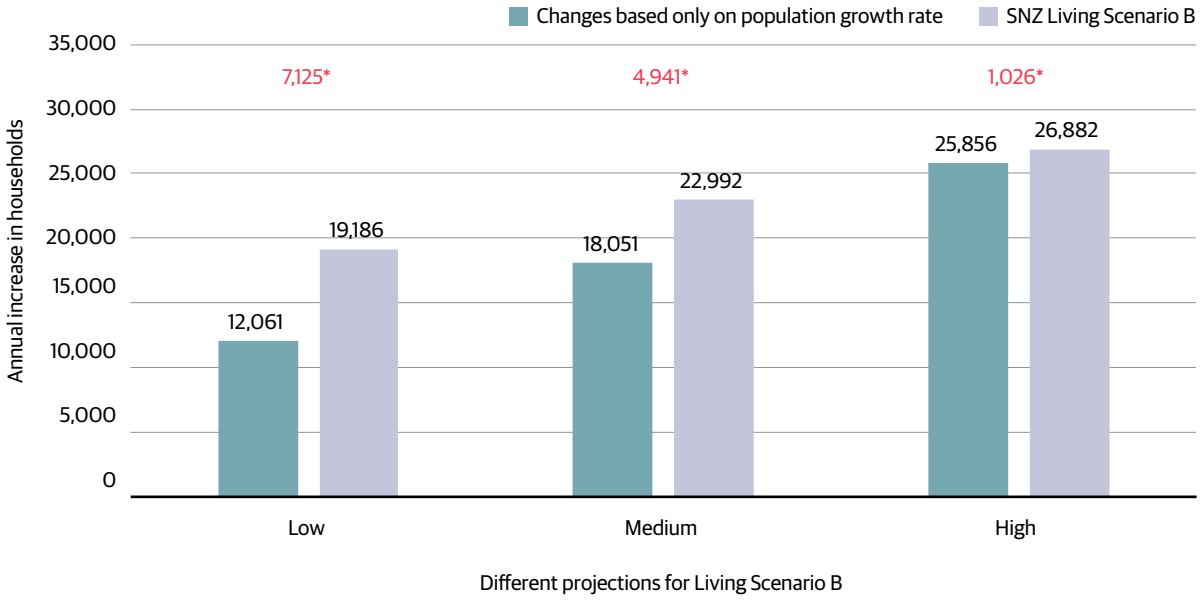
Under SNZ's projections, the annual household population gap was **7,125** households for 'low', **4,941** for 'medium', and **1,026** for 'high'. The older the demography, the higher is the range. SNZ's projections for both 2038 and 2060 show that with higher fertility, lower mortality, and higher migration (High B), the shortfall of households compared with housing stock tied to population growth will be substantially less than in the 'low' fertility, 'high' mortality, and 'low' migration scenario (Low B).

These projections show why estimating household increases using only *projected* population growth will underestimate housing demand. There is a popular perception that cutting migration will alleviate demand for housing, but the results here also show otherwise. Assuming that stopping migration will solve the housing crisis has no empirical basis. Fortunately, local councils are using SNZ's household projections to estimate housing demand.[56]

Even so, the potential gap is more material than the above calculations indicate. This is because they implicitly assume the number of houses is currently desirable for the size of the population.

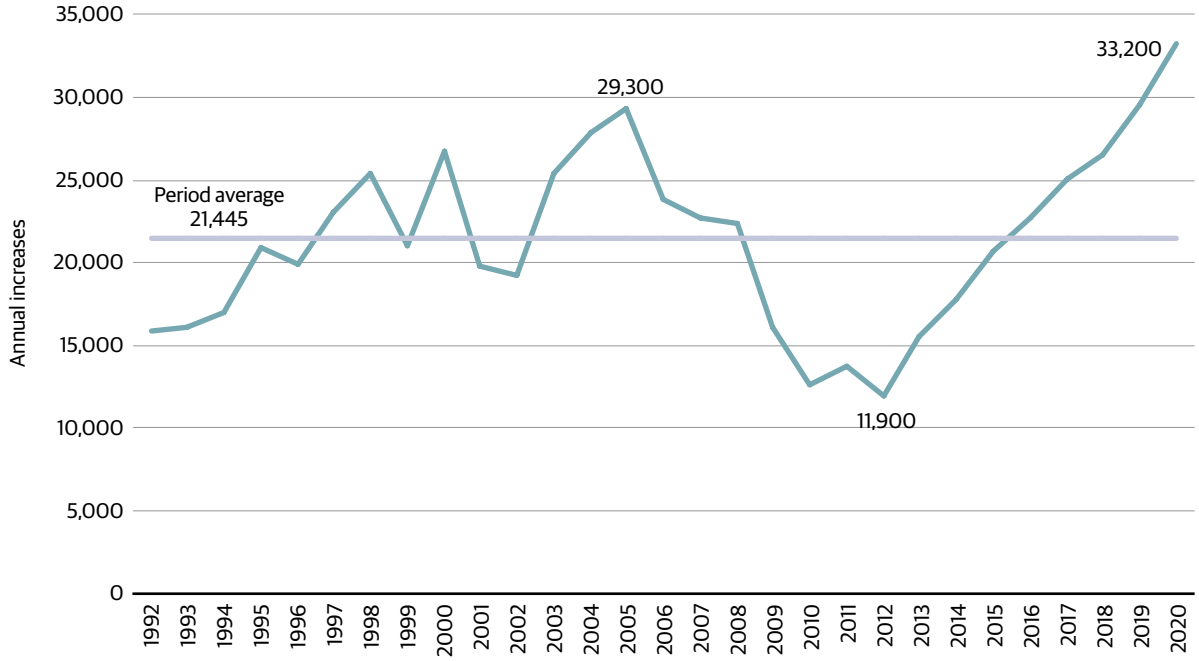
That 'desirable' assumption is doubtful. The current high median house prices relative to incomes mean that crowded households exist relative to the required households. If public policies succeed in lowering prices by freeing up the supply of housing, we should expect fewer overcrowded households. This is another reason for planners to plan for housing stock to grow faster than population, particularly in areas with higher price pressures.

Figure 10: Average annual increase in households (2019–2060)



Source: Statistics New Zealand and author's gap analysis calculations.
Note: *Shortage: These numbers show the undersupply shortfall of housing.

Figure 11: Annual increase in the stock of private dwellings (1992–2020)



Source: Statistics New Zealand (years ended June).

CHAPTER 4

Qualitative research and analysis

Academic literature on the interlinks between housing and demography finds that housing construction does not respond immediately to an unanticipated increase or changes in population. The inelasticity of supply as shown in the studies tends to be the main factor for rising house prices.

Multiple studies have covered the economic consequences of demographic change in the housing market. Harvard's Greg Mankiw and David N. Weil showed how baby boomers reaching adulthood and their higher fertility rates increased housing demand and inflated real house prices beginning in the 1970s in the United States.[57] From the 1970s to 1980s, US house prices rose between 18% and 32% because of demographic ageing with inelastic supply.[58]

New Zealand's points-based immigration system attracts high-skill migrant workers, especially those looking for a job or just starting one. William Cochrane and Jacques Poot found that migrants trigger the demand for housing, and that demand can only be met immediately by 'crowding in', having a vacant dwelling available, or constructing new housing.[59] Andrew Coleman and John Landon-Lane's report for the RBNZ showed that an inward net migration flow equivalent to 1% of the total population corresponded to an 8–12% increase in house prices after one year from 1962 to 2006.[60] Poot's work considered the migration effects of returning citizens as well, taking into account New Zealand's Trans-Tasman bubble. Therefore, higher net migration increases house prices in the short term, especially when housing supply is unduly inelastic.

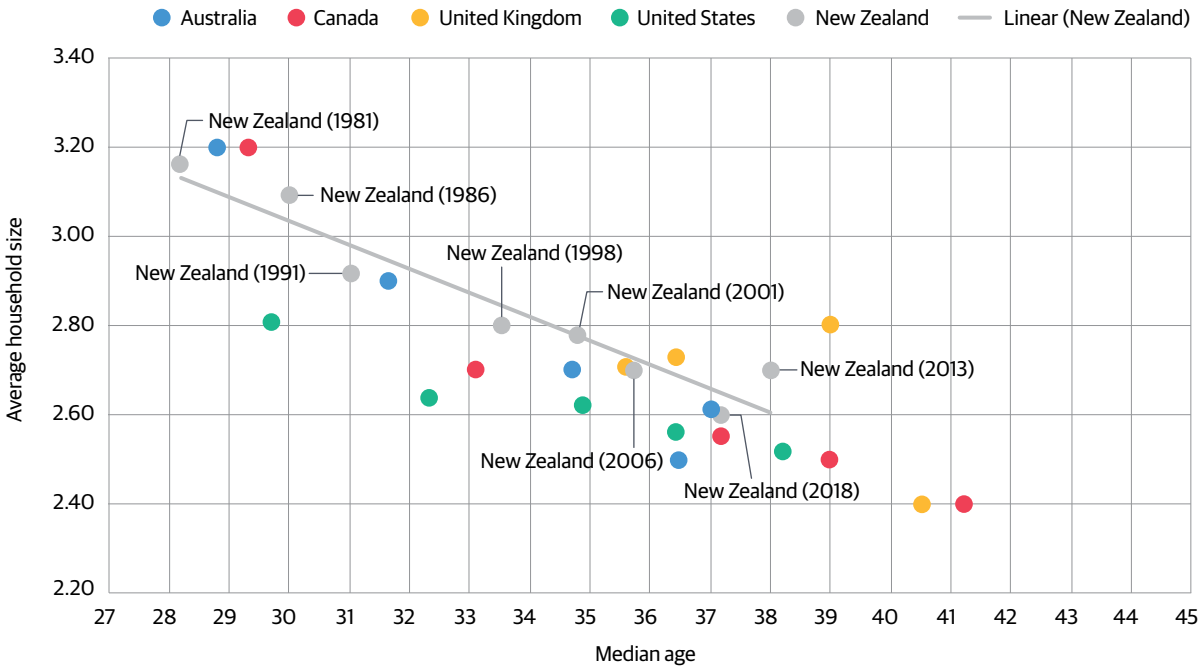
'Empty nests' and 'crowded houses'

Apart from migration, changes to fertility in our population and demography can affect how much housing supply is needed as household composition shifts. Ageing has created both housing and fiscal challenges for policymakers. Even without migration, as shown in the Spectrum and SNZ datasets, ageing itself increases housing demand and 'empty nests' become more prevalent.[61] Natural demographic increases and migration into New Zealand increase the demand for houses.

At the end of World War II, the average household size in New Zealand was 4.42 and the median age was 29.4 years.[62] The spike in fertility rates during the baby boomer era reduced the median age to 28.2 years by 1981. In 2018, the median age had risen to 37.2 years while the average household size dropped to 2.6. SNZ indicates that the average household size may drop further to 2.4 by 2038 under their median projections.[63] As a result of population changes, property development has already diversified its new housing stock with multi-units comprising "40% of all new dwellings consented since 2019," including units built as part of retirement complexes.[64]

Like in other OECD countries (see Figures 3 and 4), the Anglosphere nations of Australia, Canada, New Zealand, the United Kingdom and the United States also show decreasing average household size and increasing median age (see Figure 12). With rising living standards and increasing life expectancy, more households comprise one to two people rather than large families with two or more children. Of course, this is also possible because of the income effects of decreasing household sizes.

Figure 12: Average household size vs median age (Anglosphere nations)



Source: Statistics New Zealand, The World Bank, Eurostats, and the OECD.

Richer societies tend to demand larger and newer dwellings (see p. 16 on income effects). The decline in fertility rates indicates a higher ratio of older Kiwis with adult children in the long term. Many couples tend to stay in their large nests without downsizing to smaller dwellings. Simultaneously, cities such as Auckland and Wellington are becoming overcrowded and unaffordable (and showing increasing homelessness).

Aggregate housing demand goes up with fewer people in a household (see Figure 12). Countries need more housing as their population ages, not just because of net migration. New Zealand therefore must build more houses if affordability is a priority. Figure 13 illustrates these developments in the past few decades in New Zealand.

Box 2: Ageing population and migration require building more houses

Like in most developed countries, New Zealand must build more houses to accommodate both population growth and ageing population – and also to curb rapid housing inflation.

- Our population is growing because of net migration.
- Our population is ageing.
- Our fertility rate is slowing.

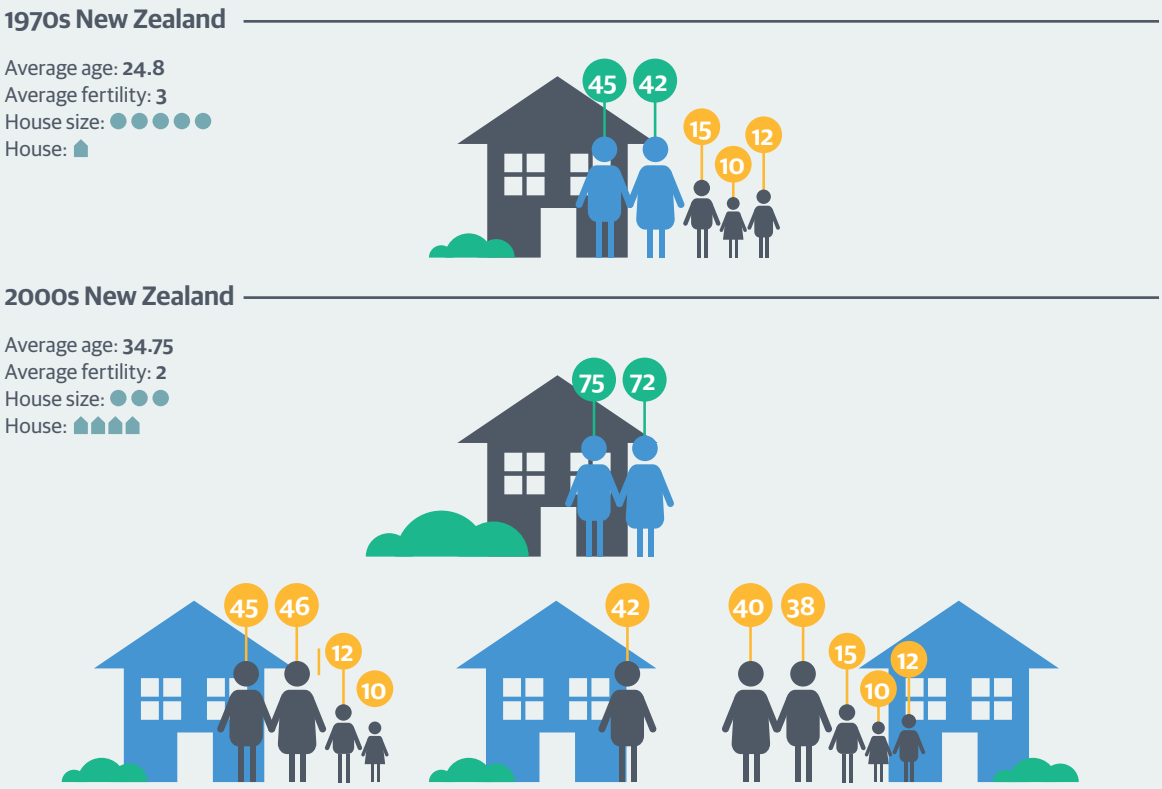
Imagine a nuclear family in New Zealand in 1970 with mum (42), dad (45) and three kids (15, 12 and 10). This family lives in one house. The average age is 24.8, the average household size is 5, and the fertility rate is 3.

In 2000, it's just mum and dad in the family home. Each of the kids has moved into their own home; two have a partner; one has two kids while the other has three.

There are now four homes. The average age is 34.75, the average household size is 3, and the fertility rate is 2. In this example, there is population growth and demographic change (ageing population and decreasing fertility rate) despite no migration into or out of New Zealand. The average household size decreased, which increased the demand for housing from one to four.

This example highlights one of the many reasons New Zealand must build more houses. Aggregating this hypothetical microeconomic example to a macroeconomic level illustrates how demographic changes significantly affect the overall housing demand. To date, New Zealand is not building enough houses to accommodate either its ageing population or net migration, let alone both.

Figure 13: From one home to four homes



Changing housing composition

Demographic composition plays a significant role in household formation, including the total number of people in a house and the relationships with each another (couples, flatmates, single parents, extended families, etc.). The average size of households with children, notably families with three or more children, has sharply declined (see Table 14).

Table 15 shows the total number of households is increasing, and more households are now single person or one-family. Households with 1 or 2 people increased from 37.3% in 1966 to 53.9% in 2018. Between 1966 and 1991, the number of households with more than 5 people declined sharply from 28% to 13%.[65] New Zealand still has the traditional housing model of the Kiwi Dream: Individuals initially live with their parents, move out and rent, purchase a first home, and finally upgrade to larger dwellings based on employment and wealth.

There has been a steady decrease in household composition and sizes. In 1966, 62.7% of households consisted of 3 or more people; in 2018, it was 46.1%. More people are having fewer children, while more individuals are living alone in 1 or 2 people households. Although not conclusive, trends show a shift away from the nuclear family towards alternative social arrangements and circumstances.

There have also been 'crowding in' effects because of unaffordability, especially among low socioeconomic families in Auckland. Multi-family households have more than doubled from 1.5% to 3.4% from 1986 to 2013. This indicates an overcrowding of families caused by the unaffordable housing market.[66] According to the 2018 Census, 10.8% of households are living in a crowded house.[67]

Table 14: Distribution of households by type (1986–2018)

	1986	1991	1996	2001	2006	2013	2018
Single	18.5%	20.2%	20.2%	22.9%	22.6%	23.5%	21.9%
1 Family	73.3%	72.2%	69.6%	67.6%	67.8%	68.3%	65.9%
2–3 Families / 2 or more families	1.5%	1.7%	2.7%	2.1%	2.7%	3.3%	3.4%
Unrelated people / Other multi-person households	5.9%	5.9%	5.2%	5.2%	5.0%	4.8%	4.9%
Total	1,078,005	1,166,568	1,268,094	1,344,267	1,454,175	1,549,890	1,653,792

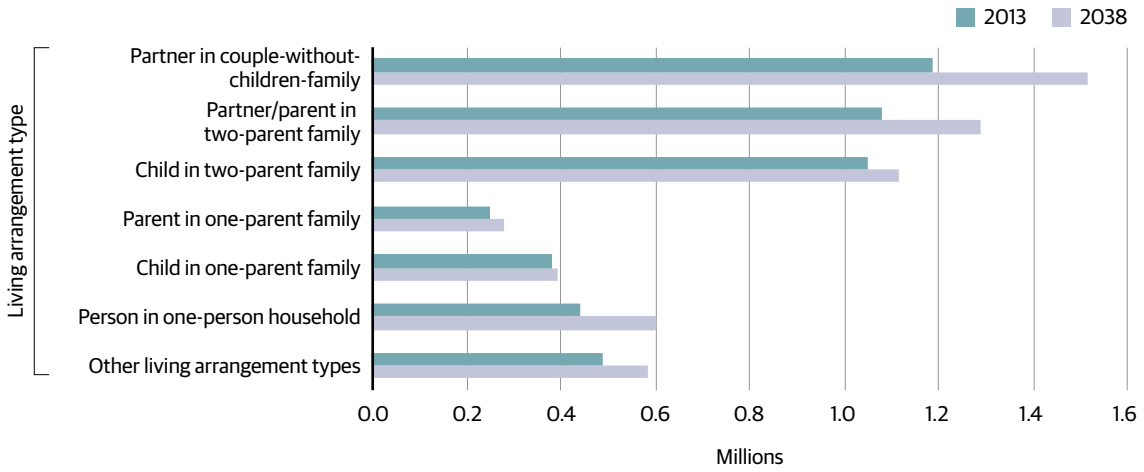
Source: Andrew Coleman and Grant M. Scobie, "A Simple Model of Housing Rental and Ownership with Policy Simulations," Working Paper 09/05 (Wellington: New Zealand Treasury, 2009), 33; Statistics New Zealand, "Household composition, for households in occupied private dwellings, 2001, 2006, and 2013 Censuses (RC, TA, AU)," Website; Statistics New Zealand, "Families and households in the 2018 Census: Data sources, family coding, and data quality" (Wellington: New Zealand Government, 2020), 23.

Table 15: Distribution of households by number of occupiers (1966–2018)

	1 person	2 people	1 or 2 people	3–4 people	5+ people
1966	12.5%	24.8%	37.3%	34.9%	27.8%
1971	14.1%	26.4%	40.5%	34.2%	25.3%
1976	15.6%	27.9%	43.5%	34.6%	21.9%
1981	18.4%	29.2%	47.7%	34.5%	17.8%
1986	19.4%	30.5%	50.0%	34.8%	15.2%
1991	20.2%	32.7%	52.9%	33.9%	13.2%
1996	20.8%	33.1%	54.0%	32.9%	13.1%
2001	22.9%	33.7%	56.6%	31.5%	12.0%
2006	22.6%	34.0%	56.6%	31.8%	11.6%
2013	22.9%	34.0%	57.0%	31.6%	11.4%
2018	21.9%	32.0%	53.9%	30.9%	15.2%

Source: Andrew Coleman and Grant M. Scobie, "A Simple Model of Housing Rental and Ownership with Policy Simulations," Working Paper 09/05 (Wellington: New Zealand Treasury, 2009), 33; Statistics New Zealand, "Number of usual residents in household, for households in occupied private dwellings, 2001, 2006, and 2013 Censuses (RC, TA, AU)," Website.

Figure 14: Population by projected living arrangement type (2013–2038)



Source: Statistics New Zealand, "National family and household projections: 2013(base)–2038 update," Website.

SNZ has also projected housing composition to 2038. The 2013 Census showed the most significant increase to the total number of couples without children (see Figure 16) – from 1,184,800 in 2018 to 1,514,300 in 2038 (27.8% increase). This not only includes young couples without children, but also couples with adult children who have 'left the nest'. Another increase is in the number of partner/parent in two-parent family from 1,079,900 in 2018 to 1,288,600 by 2038 (19.3% increase). The number of 1-person households also increased from 438,600 to 599,400 (36.7% increase). Our ageing population has helped increase couple-only and 1-person households or empty nests.

Young married couples and partners have different needs compared with retired couples. For younger couples or single people, cities generally offer better work and lifestyle opportunities. Meanwhile, living in quieter

suburban homes might suit older people. *An elastic housing market could cater to all these demographic shifts.*

Global decline in fertility rates

Fertility rates have been rapidly declining across the developed world, accelerating population ageing. According to the OECD, the average total fertility rate of member countries was 1.66 in 2019, well below the replacement figure of 2.1.[68] Globally, fertility rates are going down due to changing social norms and better health outcomes. With improvements in quality of life, there is less need for parents to have multiple children.

Many countries have tried various policies to increase fertility rates to improve population growth.[69] Policies range from the baby bonus in Australia to cash subsidies for parents in South Korea, Germany, Japan and Singapore. Although some OECD studies show family packages improving fertility rates, the RAND Corporation finds that government policies specifically targeting low fertility rates *can slow* the declining rate, but not reverse them.[70] Our projections show that faster ageing could occur if New Zealand's fertility rate drops to 1.5, which can be seen in Western European and some East Asian countries.

Housing affordability and declining fertility rates

Although migration affects median age projections, changes to total fertility had the most significant impact on the slowing down or speeding up of population ageing across the Spectrum scenarios. Even with lower migration, the difference between low and high fertility was between 41.7 years and 48.5 years (see Table 3).

As mentioned before, faster population growth with an inelastic housing supply means greater housing and infrastructure demand in the short run. But it also means a younger median age. A younger population may mean a faster growing economy with more labour. A lower median age may mean a lower dependency rate, more tax revenue, and potentially fewer negative consequences on the housing market in the short run. David E. Bloom, David Canning and Günther Fink suggest economic growth slows down with population ageing as labour force participation drops and savings increase.[71]

With the current inadequate supply, an unaffordable housing market is likely reducing fertility rates. Tighter housing means lower fertility, so getting into the bigger shortage scenarios may put New Zealand into the lower fertility scenarios close to 1.5 – seen in Germany and Japan. This would not only self-limit the extent of housing but also impose a substantial cost on families and/or young couples who would have preferred having children sooner or having more children.

The United Nations is exploring the reasons for low fertility across certain developed nations in the European Union and East Asia.[72] The research so far suggests that housing unaffordability is partly the cause – *the housing squeeze hurts fertility rates*.

For instance, in a case study in Denmark, fertility was found to be endogenous to the housing market. Research from Cornell University shows that short-run drops in house prices increase the fertility rate of homeowners.[73] Mimi Liu and Jeremy Clark from the University of Canterbury found that higher house prices reduced fertility rates among renters and had ambiguous effects on homeowners.[74] W.A. Clark correlated living with an unaffordable housing market in metropolitan areas in the United States to the *deferment* of first childbirths by three to four years.[75] Li Pan and Jianguo Xu found strong correlations between urban fertility rates and house prices in China. Fertility rate was higher in cities where housing was more spacious and more affordable.[76] These international studies indicate that housing costs can sometimes prevent couples from having as many children as they may want to have.

CHAPTER 5

Housing policy and political realities

Political incentives

Successive governments have either denied the housing problem or failed to deal with it adequately. Previously, Labour attributed the excess demand to speculators from China.[77] In December 2020, Prime Minister Jacinda Ardern said home-start grants for first-home buyers was a potential solution.[78] In 2016, then Prime Minister John Key called excess demand a "housing challenge" and denied there was a fundamental problem.[79] National's then-Housing Minister Nick Smith largely ignored the problem, saying "someone has to buy the houses and so of course they will be affordable to somebody."[80] Both sides either refused to accept responsibility or tinkered around the edges of an institutional problem.

Many political science studies suggest that politicians tend to focus on doing what is necessary to get re-elected – especially in New Zealand's short three-year election cycle. According to Randall G. Holcombe, the 'median voter theory' legitimises electoral competition towards the centre of politics.[81] Political incentives are one of the core reasons for the continuing housing crisis. Despite homeownership being the lowest in 70 years, 65% of Kiwis own properties[82] and do not want prices to fall. Case in point is former Australian Prime Minister Tony Abbott saying he wanted to see house prices to increase in Sydney despite the importance of housing affordability. "As someone who, along with the bank, owns a house in Sydney I do hope our housing prices are increasing," Abbott said in 2015.[83]

International housing policies and examples

International cities and financial hubs such as Hong Kong, Vancouver, Sydney, Melbourne, Los Angeles, London, Auckland, Singapore and Seoul are now among the most unaffordable cities for housing.[84] Governments around the world are focusing on curbing excessive demand *instead of scaling up supply*.

- In 2013, Australia banned non-residents from purchasing existing houses and imposed restrictions on foreign investment into property markets.[85] The government also brought criminal charges against those who persisted with illegal property investment.[86] The housing market in cities such as Sydney remain extremely expensive.
- South Korea is suppressing housing demand to deal with Seoul's unaffordability crisis and curbing domestic and international speculation. Using these "regulations-driven" policies, the government has drastically increased taxes on property owners and imposed a 20% acquisition tax on foreign investors.[87] House prices in Seoul still rose by 56.6% since 2016.[88] In 2021, President Moon Jae-in acknowledged the failure of policies targeting housing demand: "We thought measures focused on curbing speculations would lead to more supply but failed to stabilize the real estate market."[89]
- Canada is pushing demand-side policies such as tax on foreign property speculation, mortgage stress tests, and the First-Time Home Buyer Incentive.[90]

Like New Zealand with KiwiBuild, Canada is pushing for building more social housing along with government programmes to expand supply. Vancouver and Toronto remain extremely expensive.[91]

Misunderstanding the supply problem

Despite Covid-19's dampening effect on our economy, house prices nationally increased by 19.8% from October 2019 to October 2020, and the median price rose to $725,000. [92] The current Labour-led government's housing policy to date has aimed at curbing demand through legislative reforms and blaming categories of buyers (KiwiBuild also misdiagnosed the problem). Simultaneously, the policy stokes demand via subsidies for first-home buyers. As the Prime Minister acknowledged last year, "We have to address the supply side issues. We don't have enough houses in New Zealand and that is a key part of our problem."[93]

Former Housing Minister Phil Twyford did introduce positive changes to housing and urban development (see Box 3), but the government has so far failed to deal with the housing crisis, especially KiwiBuild. The ultimate solution is to free up supply.

Despite what many New Zealanders think, speculation and excess demand are not the main culprits of our housing crisis. Labour amended the *Overseas Investment Act* in 2018 – which mandates the registration of foreign-owned land and housing – and banned foreign housing investment into New Zealand (excluding Australian and Singaporean). The amendment also extended the bright-line test to five years, and initially hoped to legislate a new capital gains tax.[94] In the first three months of 2017, foreign investment, including Chinese and Australian, accounted for only 3% of the houses bought nationally.[95] Economist Shamubeel Eaqub says directing the blame at foreigners and migrants on the housing crisis is factually and empirically wrong.[96]

Public housing projects such as KiwiBuild displace private supply rather than increase total supply. One KiwiBuild house built and sold by

Box 3: National policy statement on urban development

Under then Housing Minister Phil Twyford, some of Labour's supply-based housing policies led to positive changes in housing and urban development, including the National Policy Statement on Urban Development for 2020.[97] The government's fast track consenting for 'shovel ready' projects resulted in:

- removing minimum parking requirements;
- allowing six storeys or higher in buildings within walkable distance to city centres and metropolitan areas;
- ensuring councils respond quickly to development needs;
- making height and density requirements reflect demand; and
- improving accessibility through better public transport.

The Initiative's Chief Economist Eric Crampton and PwC Chief Economist Geoff Cooper both welcomed these changes and noted their significance for urban development.[98]

The government also passed the Infrastructure Funding and Financing Act in July 2020.[99] This is like Texas' Municipal Utility Districts, which allow establishing Special Purpose Vehicles to enable private developers to raise debt for infrastructure and are paid back in up to 50 years of levies on those properties without adding to the liabilities of local councils.[100]

the government without a subsidy is one less buyer on the market for houses built privately at the same cost. KiwiBuild failed dramatically,[101] with only 548 houses built in three years, nowhere near the target of 100,000 in 10 years.[102]

Interest groups too have not helped the case for urban development. For example, NIMBY-ism in infrastructure and dwelling density,[103] the counterproductive nature of the urban planning profession,[104] and 'cultural heritage' activists[105] have spurred anti-development sentiments.

Flaws of restrictive zoning laws

Laws and regulations may aim to improve market outcomes by correcting externalities. Poor quality laws and regulations can worsen outcomes by inhibiting construction flexibility. This is the case in Los Angeles and New York. The Brookings Institution's Jenny Schuetz says overly restrictive zoning laws inevitably slow housing construction and development, and drive up house prices and rent.[106] Although zoning laws fulfil important social objectives, excessive regulations typically worsen housing affordability.[107] It is a question of trade-offs for policymakers.

Joseph Gyourko from the University of Pennsylvania and Raven Molloy from the US Federal Reserve studied market effects caused by excessive regulation and concluded that zoning laws "raise house prices, reduce construction, reduce the elasticity of housing supply, and alter urban form."[108] New Zealand's zoning laws too have created an artificial scarcity of land and restrictions for new housing construction. There have been far too many restrictions on density – although the NPS on Urban Development, the Auckland Unitary Plan, and the Wellington Spatial Plan alleviate some of those constrictions. Zoning against density prevents building and construction in places where people want to live, and makes it expensive and exclusive.[109]

Up-zoning brownfields for apartments, townhouses and greater density is critical for improving affordability. Motu's Arthur Grimes recommends expanding density zoning for more apartments and other dwellings in Auckland.[110]

Restrictions on density and restrictions on land supply have caused artificial land price inflation – as they have in Auckland. Arthur Grimes and Yun Liang found that land just inside the Metropolitan Urban Limit (MUL) is valued around 10 times higher than that outside.[111] The MUL is a legal restriction on land supply.[112] From 1980 to 2010, Auckland has doubled its regional population with 300,000 more residents but without extending the MUL. Residential demand has gone up and left supply far behind. This is the real reason the value of land quadrupled in many suburbs between 1994 and 2011.[113] Twyford concurred in a speech to The New Zealand Initiative in 2019.

> The unwillingness or inability to invest in the infrastructure to support development stops cities growing. When a city cannot grow in response to demand, a pressure cooker effect is created, which is what has given Auckland some of the most expensive urban land and housing in the world relative to local incomes.[114]

The *Resource Management Act 1991* (RMA) prevents local authorities from responding to housing demand, imposes excessive consent processes based on sustainable development, and slows development significantly. The Act exacerbates resource allocation problems as it undermines private property rights. Council consent costs have also increased substantially, creating additional transactional, regulatory and compliance costs for developers.[115] Although the RMA makes it hard to change plans, it does not stop local councils from adopting a liberal district plan, which Christchurch has done.[116]

Zoning rules preclude developers from building for the kinds of housing consumers prefer. For

instance, if an older couple want to downsize to a low maintenance townhouse or apartment, or even build a smaller flat within that particular section so they can let their adult children raise their kids in the larger dwelling, enough zoned areas are needed to allow such construction. But zoning laws make it basically illegal for such a couple to move into that new dwelling or a different neighbourhood if it is zoned against density. This results in worse outcomes as the couple have fewer incentives to move out of their five-bedroom empty nest.

Local councils especially have a monopoly on building approvals within zoned areas, making it harder for developers to start construction quickly. Burdened by infrastructure financing costs, councils have little incentive to build.[117] The reason is the main tax revenues such as GST and income taxes go to the central government, while councils bear all the costs. This makes little institutional sense. What then Finance Minister Bill English said in 2013 still holds true.

> Housing affordability is complex in the detail – governments intervene in many ways – but is conceptually simple. It costs too much and takes too long to build a house in New Zealand. Land has been made artificially scarce by regulation that locks up land for development. This regulation has made land supply unresponsive to demand.[118]

The past few governments from both the left and right have failed to address housing affordability. Faster and more liberal building and resource consenting processes should allow supply to catch up. Government needs to offer more 'pro-development' incentives to councils and stakeholders. Population ageing and demographic changes make this even more important.

Localism

New Zealand's centralised system of government allocates local zoning decisions and costs of facilitating urban development to local councils, which see little benefit in growth. The misalignment of costs, benefits and decision rights means that urban areas can have incentives to restrict, rather than promote, growth in housing to accommodate a changing population. Restricting councils' ability to block urban growth is one potential solution. But measures that encourage councils to see growth as a benefit to be welcomed rather than a cost to be contained may be more sustainable.

Germany and Switzerland have shown competent and effective local council responses.[119] With more Germans living longer and having fewer children, and more single people moving to metropolitan areas, the average household size has dropped below 2.1. Despite this, house prices in Germany overall have remained largely stable for decades.[120] However, the recent low-interest environment has pushed up asset prices and house prices as well. Similarly, in Switzerland cantons and municipal devolutionary governance keep local government competitive in a highly autonomous and localised arrangement.[121]

In Houston, councils respond to unaffordability by scaling up supply, or risk losing residents and local tax revenue.[122] Houston incentivises local authorities to push for pro-development policies, which lead to more housing near urban areas. House prices in Houston remain consistently affordable at a median multiple of around 3 (compared to 7.0 in New Zealand) because local government allows housing and urban development to meet growing demand.[123]

These arrangements only work because infrastructure financing tools match the incentives for local authorities. Localising decision and veto rights without offering corresponding benefits of growth incites anti-development sentiments as locals bear the costs without generating the revenue. That is why Harvard's Ed Glaeser argued for redirecting zoning decisions from local councils to a higher

authority like state governments – or in the case of New Zealand, central government – and bypass the NIMBYs.[124]

New Zealand could have Community Development Districts like in the Municipal Urban Districts in Texas for more efficient infrastructure financing.[125] Although the new *Infrastructure Funding and Financing Act* makes important changes, more could be done. By making local governments more competitive, more autonomous, and less monopolistic, central government can motivate local councils to scale up urban development and own new tax revenues.

CHAPTER 6

Demographic projections and seeing beyond housing

Demographic changes not only affect overall housing demand, but also cause long-term problems for public finance and fiscal prudence. In his paper, "Squeezed In and Squeezed Out", Andrew Coleman says increased longevity and demographic ageing lead to negative financial implications for home ownership, especially among young people.[126] A higher dependency rate and fewer taxpayers increase the fiscal pressure on those who work. This increases financial constraints on young people by lowering their disposable income after tax.[127] Attaining higher productivity, continuing our liberal migration system to fill skilled labour shortages, and lifting per capita income would improve our public finances.

Working beyond retirement age

Ageing has negative fiscal effects. But increasingly, more people are working beyond the retirement age globally. Increasing health expectancy rates may offset some of the fiscal effects of demographic ageing – more people are working post retirement.[128] In 1996, only 14% of Americans foresaw working beyond the retirement age of 65, unlike 45% in 2019.[129] For New Zealanders aged 60–64, labour force participation increased from 26% in 1990 to 73% in 2015. The percentage of those working above 65 years went from 6% in 1990 to 22% in 2015, one of the highest across the OECD.[130] More people are getting healthier and willing to work while receiving superannuation – healthy life expectancy has increased. With New Zealand's participation rate (people between the ages of 15 and 65) at 85.3% in 2019,[131] and expected to fall, working beyond 65 will strengthen New Zealand's fiscal health.

Increasing dependency ratio

RESULT 5: Population ageing means proportionally fewer workers and taxpayers in the future.

The proportion of New Zealanders within the dependency ratio increases under all 36 scenarios in the Spectrum analysis. According to the United Nations, the dependency ratio "relates the number of children (0–14 years old) and older persons (65 years or over) to the working-age population (15–64 years old)."[132] The ratio expresses the relationship between the working-age and non-working age populations. Greater ageing means more pressure on the working populace to fund public services. The World Bank estimates that the dependency ratio in New Zealand was 55.2% in 2018.[133] In other words, there is one Kiwi of working age for every two children or seniors. As the country ages, the dependency rate will increase (though constrained by migration and fertility changes). Out of the six most plausible scenarios, optimistically, the dependency ratio will increase to 0.66 while the worst-case scenario would be 0.72 (see Figure 15). A higher birth rate means short-run increases to the dependency rate, while more births mean more future taxpayers to support older generations heading into retirement. A higher dependency rate could affect the tax revenue available for public funding for healthcare, superannuation, and infrastructure development.[134]

Regardless of life expectancy, migration and fertility, there will be more demand for taxpayers to fund public services. New Zealand also needs skilled migrants to fill labour and human capital deficits.[135]

RESULT 6: The proportion of older New Zealanders will increase by least 23% by 2060.

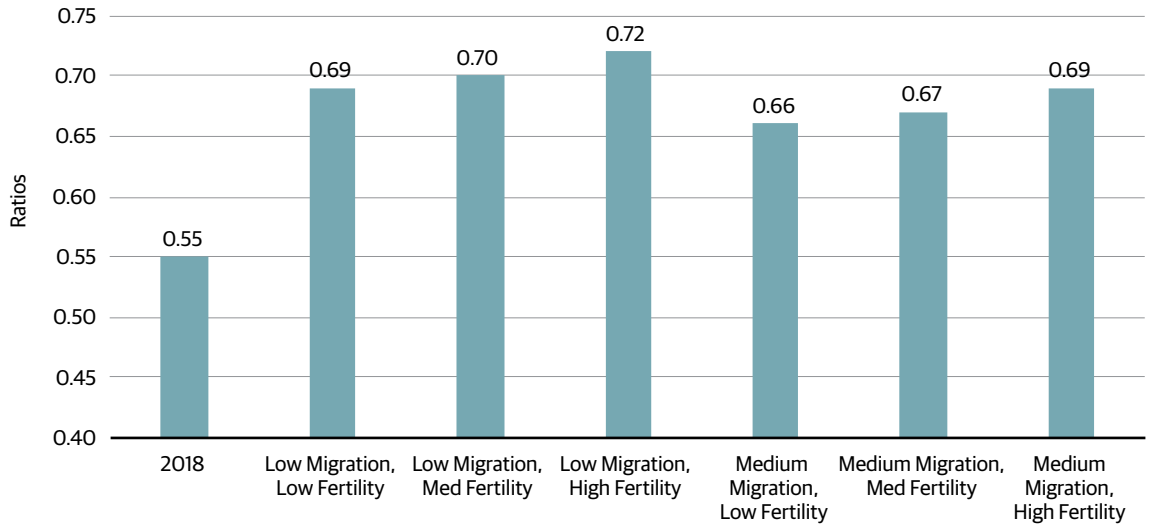
New Zealanders will be increasingly older in the coming decades. Of the six most plausible Spectrum scenarios, 22.68% to 28.04% New Zealanders (a difference of 5.36%) will be aged 65 and over by 2060 (see Figure 16). This is a sharp increase from 15.21% in 2018.[136] As a bare minimum, our elderly population may go up from 7.5% to 12.8%. This reflects the potential difference between pursuing higher moderate levels of migration with higher fertility or lower levels of migration and lower fertility.

Different migration levels either increase or slow the process of population ageing. 'High' fertility and 'medium' migration resulted in the lowest proportion of New Zealanders over 65 years (see Figure 16). 'Medium' migration and 'high' fertility would reduce the proportion of the elderly, with only 22.68% projected to be 65 and over by 2060. New Zealanders are still likely to be markedly older across all the six realistic scenarios.

Therefore, our dependency rate would likely increase, and labour participation rates would likely drop. This is unless more people over the retirement age decide to work. An ageing population means more significant fiscal constraints and demand for public goods.[137]

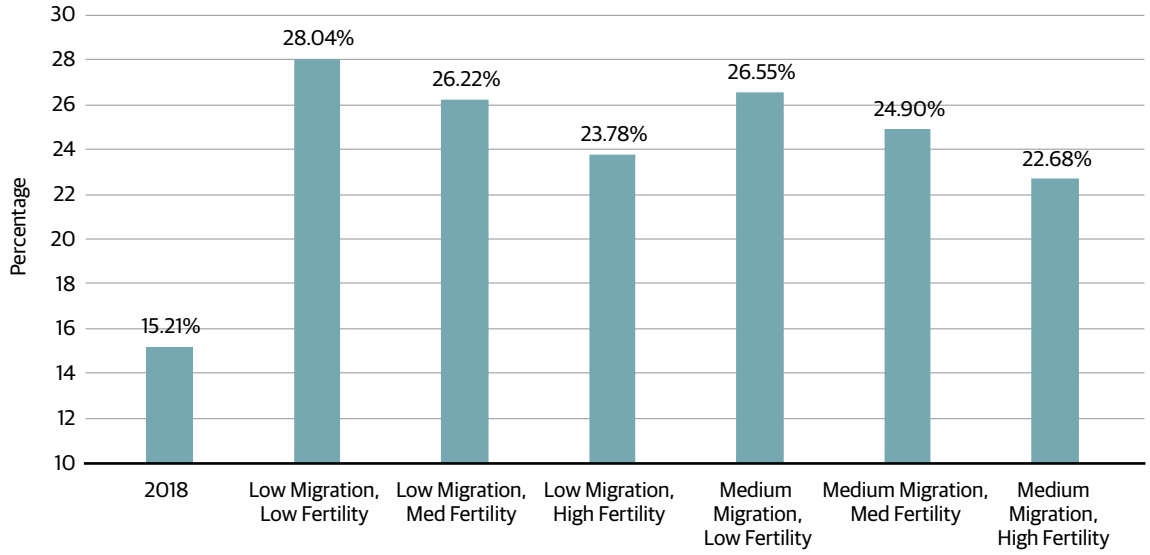
The question is how the government will respond to these fiscal challenges. In the past few decades, Treasury deemed population ageing as one of the fundamental challenges to New Zealand's long-term fiscal health.[138] A far older demography means fewer people who can pay tax, additional superannuation, and healthcare costs – and simultaneously, a far higher dependency rate. As Treasury noted: "Labour market, tax and retirement age settings, and supportive employers will play important roles in future economic growth."[139] A slower ageing population also could ease these fiscal constraints.

Figure 15: Dependency ratio projection under medium life expectancy (2060)



Source: Author's calculations.

Figure 16: Proportion of New Zealanders 65 years and over under medium life expectancy (2060)



Source: Author's calculations.

Conclusion

Housing

Despite common perceptions, population growth is not the sole driver of housing demand. Changes in living arrangements and household composition play a role, too. Assessing the number of new annual dwellings needed from just population changes severely underestimates the supply needed.

For the six realistic Spectrum scenarios, the average annual number of new dwellings needed from 2019 to 2038 ranges between **26,246** ('low' migration and 'low' fertility) and **34,556** ('medium' migration and 'high' fertility). From 2019 to 2060, the number would be **15,319** ('low' migration and 'low' fertility) and **29,052** ('medium' migration and 'high' fertility), respectively. The projected demand to 2038 or 2060 does not take into account the existing shortage of dwellings, or the fact that housing does not last forever – they need demolition and replacement. In October 2019, Infometrics estimated the housing shortage to be 40,000.[140] Such a shortfall accentuates the need to urgently scale up urban development and housing supply.[141] Although the number of dwellings consented reached 38,624 in November 2020, it is imperative the government frees up development both up and out to build the dwellings.[142] Regarding housing demand, the public needs to consider the declining average household sizes. Local government reforms need to incentivise councils to ease constraints on houses and infrastructure.[143]

Beyond housing: Prospects for fiscal prudence

Beyond housing, the Spectrum projections show fiscal implications. More people are living longer and becoming heathier. As Steven Pinker said in *Enlightenment Now*, longevity and improvements to healthcare, sustenance and wellbeing have been positive trends in human progress.[144] However, these trends mean new challenges. Population ageing means proportionally fewer future workers and taxpayers. The dependency rate to 2060 rises from 0.55 to between **0.66** and **0.72** in our six most plausible scenarios. Simultaneously, the proportion of people over the age of 65 will go from 15.2% in 2018 to at least **23%** in 2060. An ageing population means a higher dependency rate and more pressure on public finance. Increased workforce participation by older New Zealanders may partly offset the growing dependency ratio. Faster productivity growth would ease the fiscal problem.

Curbing migration to reduce pressure on housing will not solve our housing shortage, but it would exacerbate a looming demographic fiscal problem from a rising dependency ratio. Cutting migration may also be considered as sound policy, but New Zealand would still have huge labour shortages to fill from skilled foreigners, mainly in construction, engineering and trade.[145]

Summary of findings

- **Housing crisis:** The housing market is extremely unaffordable due to supply not keeping up with growing demand. Covid-19 and expansionary fiscal and monetary policies have exacerbated the problem. But New Zealand's housing crisis is not primarily a *demand* problem. It is inadequate supply. Instead of directly tackling supply, the Labour government distracted itself with KiwiBuild and ineffectual demand measures – only to

worsen the crisis. The National Policy Statement on Urban Development and changes to infrastructure financing are promising, though.

- **Spectrum results:** Under all 36 scenarios except three, New Zealand's population in 2060 will be larger than it is today. Under all projections, the median age will be higher. Even if migration is low, total population will grow substantially. Fertility rates are more important than migration for ageing across the modelled scenarios.
- **Demographic projections and housing demand (1):** Projections for household size and total households for 2038 and 2060 were created by combining Spectrum's population and median age projections with a quadratic regression relationship between median age and household size. For the six most plausible demographic scenarios to 2060, the number of additional annual average dwellings is between 15,319 ('low' migration and 'low' fertility) and 29,052 ('medium' migration and 'high' fertility). Based on just population growth, the projected annual average number of dwellings is between 5,452 ('low' migration and 'low' fertility) and 21,543 ('medium' migration and 'high' fertility). That would be an *underestimation* of 9,867 dwellings for the former and 7,509 for the latter (an annual shortfall percentage of 64% and 26%, respectively).
- **Demographic projections and housing demand (2):** We used SNZ's Living arrangement B Low, Medium and High population and household projections for 2038 to calculate the effect of factors other than just population growth. As a percentage of projected population in each scenario, the difference was 5.6%, 3.5% and 1.6% for 2038 (and 12.5%, 7.8% and 1.4% for 2060), respectively.
- **Empty nests and crowded houses:** As societies are getting older with an increased median age, household size is shrinking. As a result, more additional houses are demanded on top of housing demand caused by population growth.
- **Flaws of restrictive zoning laws:** Restrictions on both density and land supply hurt development. Arthur Grimes said intensification and dense development could lower dwelling prices. The Auckland MUL created an artificial land scarcity which inflated the price of land and housing within the urban limit. The US Federal Reserve and The Brookings Institution have shown that restrictive zoning laws, raise house prices, reduce construction, and worsen housing supply inelasticity.
- **Demographic effects beyond housing:** Demographic changes also have fiscal implications. The dependency rate goes up with ageing. The proportion of those over 65 years goes up to at least 23% by 2060, according to Spectrum projections. This results in fewer future taxpayers. Demands on working-age New Zealanders to meet the costs of public services such as healthcare and pensions will increase. Faster productivity growth would help fund the additional public services in the long term.
- **Housing and demographic interactions:** Unaffordable housing can depress fertility rates. Fertility was the most significant factor in Spectrum projections for the median age. Research on how housing affordability affects fertility shows that short-run drops in house prices increase the fertility rate of homeowners.
- **Policy implications:** It is imperative for the government to free up property development. The existing shortage is set to worsen due to further population growth and population ageing.

Box 4: Key recommendations

Demographic change will increase demand for housing and contribute to New Zealand's housing shortage in the long term. Ageing populations involve smaller household sizes, so more homes are required for an older population even if population size is held constant.

Previous reports by the Initiative have made recommendations that would enable more building.

This report recommends only that we recognise the role of changing demographics in increasing demand for housing, and the need for urban planning regimes to accommodate it and the changing nature of housing. It also calls for aggressive measures to enable more housing supply in places people want to live.

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APPENDIX 1: STATISTICS NEW ZEALAND YEARBOOK DATA

Table 16: Statistics New Zealand Historical Data

Year	Median age	Average household size
1981	28.20	3.16
1986	30.00	3.09
1991	31.00	2.92
1998	33.50	2.80
2001	34.80	2.78
2006	35.70	2.70
2013	38.00	2.70
2018	37.20	2.60

Source: Statistics New Zealand, "Yearbook collection: 1893–2012," Website; author's calculations.

APPENDIX 2: STATISTICS NEW ZEALAND SCENARIO B

The following text on the definitions of Living Arrangement A and B is directly sourced from Statistics New Zealand. The report uses Living Arrangement B for its SNZ household projections for both 2038 and 2060.

Living arrangement type rates (LATRs)

There are two alternative LATR variants – designated A and B. Variant A assumes that LATRs will remain constant at 2013 levels. Variant B assumes that LATRs will change linearly between 2013 and 2038, based on an assessment of observed trends between 1986 and 2013 and likely future trends, by sex and single year of age.

Variant B is the preferred variant because it has been formulated to produce demographically plausible results. For variant B, the main changes in LATRs assumed between 2013 and 2038 are:

- Partner in couple-without-children family: Increasing rates for males aged over 70 years. Increasing rates for females aged up to 42 years, and 63 years and older. This reflects lower fertility rates with fewer couples having children, couples having children at older ages, and a slight convergence of male life expectancy to female life expectancy with more couples having both partners living to older ages.
- Partner/parent in two-parent family: Increasing rates for females at most ages, especially at ages 30–70 years. This reflects lower fertility rates with fewer couples having children and delayed childbearing.
- Child in two-parent family: Increasing rates at most ages, especially at ages 0–30 years. This reflects decreased rates of single parenting from separation, divorce, and childbearing outside couple relationships, as well as children living with parents at older ages.
- Parent in one-parent family: Increasing rates for males. Decreasing rates for females, which reflects decreased rates of single parenting and lower fertility rates.
- Child in one-parent family: Decreasing rates at younger ages, especially at ages 0–20 years. This reflects increased rates of re-partnering of parent.
- Person in other multi-person household: Decreasing rates at most ages. This reflects increasing rates of partnerships.
- Person in one-person household: Increasing rates especially at ages 30–70 years for males. The proportion of female's years living alone is assumed to drop, given a slight convergence of male life expectancy to female life expectancy.
- Person in non-private dwelling: Decreasing rates at older ages, associated with increasing life expectancy and well-being and declines in morbidity rates, enabling people to live independently at home longer.
- Average number of families per family household is assumed to increase from 1.050 to 1.075, reflecting increasing co-residence of multi-generational families.
- Average number of people per other multi-person household is assumed to increase from 2.637 to 2.773, reflecting group-living in response to housing costs.

For variants A and B, the following factors remain constant at the 2013 levels:

- the proportion of two-parent families with dependent children is assumed to remain constant at 0.817.
- the proportion of one-parent families with dependent children is assumed to remain constant at 0.720.

Source: Statistics New Zealand, "National family and household projections 2013-base," Website.

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New Zealand faces a severe housing crisis. House prices nationally have gone up by 37% since 2015, and cities such as Auckland and Wellington have become extremely unaffordable for most Kiwis.

Demand-side measures such as foreign ownership bans and bright-line testing are politically popular but do not directly address the problem. Border restrictions were enforced since Covid-19 began, which cut net migration to zero – and yet rent and housing costs have risen sharply.

Migration is only a part of housing demand. Demographic changes (long-run population growth, ageing, fertility, household size, etc.) mean that New Zealand will need far more dwellings, especially when housing supply is unduly inelastic. What is worse is that the effect of declining average household sizes on housing demand is rarely discussed in the public sphere.

Housing policy using only projected population growth would markedly underestimate future demand. Projections to 2038 and 2060 show that annually we need to scale up supply between 26,246 and 34,556 for the former, and 15,319 and 29,052 for the latter. These figures do not take into account the annual demolition and replacement rate of dwellings and the current undersupply of 40,000. Since 1992, New Zealand has added only 21,445 net private dwellings annually to the housing stock.

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