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Populate and Perish?

Modelling Australia's Demographic Future

Jessica Brown and Oliver Marc Hartwich



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Executive Summary

Although population growth has been one of the most hotly debated topics in recent months, public discussions have been driven by populism, not by evidence-based analysis. In the recent federal election, both Labor and the Coalition seemed to suggest that they could—and would—limit population growth, particularly by restricting migration. The Greens went a step further by endorsing a population cap.

But these platitudes overlook a fundamental fact. Under every realistic scenario, Australia's population is going to keep growing. Australians will also keep getting older—a fact often neglected in the current debate—which will have huge implications for our future policy environment.

Under all but one of the 36 scenarios modelled in this report, Australia's population will grow. Only with zero net migration and falling fertility—which is practically unachievable and widely regarded as undesirable—would Australia's population shrink or stabilise. Some degree of population growth is an inevitable reality.

By focussing on cutting migration as a way to limiting population growth, the current public debate has also ignored the role of fertility—which matters as much if not more—in determining population size and age distribution. Anti-growth campaigners suggest that if migration were reduced, we could somehow stabilise population growth. But this is not true. Even if migration were more than halved to 70,000 a year (which we do not advocate), we would still have a population of more than 29 million by 2050 if fertility remained constant.

It is extremely difficult to predict the future of Australian demographics. Changes in the birth rate are hard to predict and even harder control, yet they will potentially have a bigger impact on population size than migration.

Under every scenario, Australia's population will get older. However, it is fertility—not migration—that has the biggest impact on population ageing. Increased migration is not the solution to population ageing. If fertility rate drops from its current level of 1.97 to 1.5, the current European Union average, median age will rise from 37 today to nearly 46 in 2050—higher if migration levels are cut. Under *all* the most realistic scenarios, more than 20% of Australians will be over 65 by 2050. And regardless of changes in migration and fertility, the number of Australians aged 80 or over will more than double to about 2 million by 2050. There will be far fewer taxpayers under every scenario. We need to plan for population ageing.

There is a trade-off. A faster growing population will require investment in housing and infrastructure; it will also be younger and better able to meet these costs. A more slowly growing population will require fewer investments in housing, roads and schools but will be significantly older, which means the cost of health care and pensions will rise while the tax base falls.

Both population growth and population ageing will happen no matter what, but the degree to which we have to deal with the challenges will depend on the policy choices we make now about migration as well as future changes in the birth rate and life expectancy.

No one can know exactly how these variables will change in the future, which means no government can accurately predict what Australia's population will look like. Population targets are unrealistic. We cannot *plan* our demographic future.

However, we can be fairly confident in predicting that Australia's population will both grow and get older—we just don't know by how much.

The best that policymakers can do is make existing institutions more flexible so they can better cope with whichever population scenario emerges. Politicians should stop pretending that they can control what Australia's future population will look like. Instead, they should turn their attention to the real policy issues that will be affected by population growth and ageing: housing, roads, pensions and our natural environment. The debate should not be about whether we will have a 'big Australia' or a 'small Australia' but about how we can make a growing Australia work and how we can make it a prosperous and liveable place for us all.

Summary of findings

- **Inevitable population growth:** Under all 36 scenarios except one, Australia's population in 2050 will be larger than it is today. Even if migration is dramatically cut (which we do not advocate), Australia's population will still grow substantially over the next few decades. Rather than focusing on a 'small Australia,' policymakers should be looking at ways to deal with the inevitable challenges of a growing population.
- **Population ageing:** Under all 36 scenarios, Australia's population will be older than it is today. In the lowest case scenario, the median age will be 38.8 by 2050. In the highest case scenario, the median age will be 49.9. The extent of population ageing over the next few decades is, however, far from certain.
- **Population size:** Because both migration and fertility affect population size, it is hard to determine the nature and composition of Australia's future population. Changes in the birth rate are hard to predict and control, yet they could potentially have a bigger impact on population size than migration. For this reason, it is wrong to think we can control Australia's population size by simply cutting migration.
- **Zero growth:** The only scenario in which Australia's population will be stable or fall is under zero net migration and lower fertility. But this is almost impossible to achieve, and is widely regarded as undesirable. Under the more likely scenarios, some population growth is inevitable.
- **Planning for population ageing:** The rate of population ageing, which depends largely on fertility levels, is hard for governments to predict or control. Under all realistic scenarios, the proportion of Australians over the age of 65 will more than double by 2050. Regardless of changes to fertility and migration, we will need to urgently reform pension and superannuation systems. The number of Australians over the age of 80 will also more than double under all realistic scenarios. This will have profound consequences for health and aged care policy.
- **Population growth and tax base:** There will be proportionally fewer taxpayers in the future. Demands on working age Australians to meet the costs of public services such as health care and education will increase. The tax base must be broadened, and the number of workers increased.

Introduction

Former Prime Minister John Howard once famously described the high-wire balancing act of raising kids and working as a 'barbeque stopper.' The expression was catapulted into the lexicon, and has variously been used to describe those 'big picture' issues that capture the ire and imagination of the nation. In the 2007 election, it was industrial relations. In 2010, it was population growth.

In the recent federal election, the issue of population growth dominated the campaign. Both major parties responded to the Treasury projection of a population of 36 million in 2050 by promising to curb and control growth. Popular anxieties about rising house prices, congested roads, insufficient public transport, water shortages, environmental damage, the economy, and the social impact of migration have played a role in shaping the debate. Populist politicians—from across the political spectrum—have done little to assuage the public's fears about these issues.

Remarkably, despite the issue being so dominant in the public consciousness, there is little understanding of how we have historically coped with an increasing population, how our population is likely to change and what it means for us, and the pros and cons of population growth. Also forgotten in the population debate is that other demographic bogeyman—population ageing.

This report, the first in a series called *Population and Growth* sets out to answer some of these questions. We modelled a range of different scenarios to determine what Australia's population might look like under different migration policies and expected changes in fertility and life expectancy.

The findings will be somewhat sobering for those who advocate limiting or controlling Australia's population growth. Under almost every realistic scenario, Australia's population will get bigger. It will also get older. In many ways, our policy choices should not be about how to control population growth but the trade-offs between population growth and population ageing. The report also finds that it is fertility—not migration—that will have the biggest impact on Australia's population size and age. Those who believe that curbing migration will stop population growth, or that increased migration is the key to meeting the challenge of population ageing, will be sorely disappointed. Instead of talking about limiting population growth, politicians should turn their attention to the policy challenges of population growth and ageing.

With these findings in mind, the main policy conclusion of this report is that population growth and population ageing are happening—whether we like it or not. In both cases, it is more a question of 'how much?' rather than whether it will happen at all. This first report in the *Population and Growth* series aims to draft a rough picture of what Australia's future population might look like. The next report will focus more closely on policy and address some of the questions and misconceptions that people often have about population growth and population ageing. Future reports in the series will address important policy questions on topics such as water, migration and housing.

The first part of this report will explain the current population debate in Australia, and explore the findings of the 2010 Intergenerational Report. Readers familiar with the debate may wish to skip directly to the second part, which contains various demographic modelling scenarios.

Under almost every realistic scenario, Australia's population will get bigger. It will also get older.

The population debate in Australia

Public debate about population and migration has a long history in Australia. Shortly after Federation, and with the Great Depression causing both birth rates and immigration to fall, the NSW government appointed a Royal Commission to look into ways to persuade young couples to have more children. In the inter-War period, the pace of population growth

picked up again as British migration boomed. Even at this early stage, some sceptics doubted whether Australia's natural environment could cope with the extra people. However, by the end of World War II, a wholly different sentiment had begun to emerge. The Japanese bombing of Darwin reminded Australians of their vulnerability, reinforcing the 'populate or perish' mentality that had long characterised debate. In the years after the War, net immigration increased tenfold.¹

A long history of migration and population growth has meant a long history of public opposition to migration and population growth.

A long history of migration and population growth has meant a long history of public opposition to migration and population growth. According to *The Australian* columnist George Megalogenis, 'No opinion poll taken in the past 60 years has found a majority of voters want to step up the immigration program, yet more than seven million immigrants have arrived since 1945.'² Recent survey data show that this level of community concern still exists. A Lowy Institute poll in March 2010 found that while three-quarters of respondents supported the idea of some population growth, nearly the same number said they did not think the population should grow to 35 million by 2050.³

The current debate has sparked not just public but also political concern. Population growth was a key part of both major parties' platforms in the 2010 election. One of Julia Gillard's first actions as Prime Minister was to explicitly distance herself from her predecessor Kevin Rudd's embrace of a Big Australia. Gillard instead argued that she believed in 'sustainable' population growth:

I do not believe in the idea of a big Australia, an Australia where we push all the policy levers into top gear to drive population growth as high as it can be. The nation's goal should not be a big Australia but a 'sustainable' Australia that preserves our quality of life and respects our environment.⁴

When Gillard became Prime Minister in late June, public anxiety about asylum seekers was high. A number of unauthorised boat arrivals had just been intercepted off Christmas Island. In the first days of her prime ministership, Gillard often spoke about population and asylum seekers together (such as in her speech to the Lowy Institute on 6 July). The message to the public was clear: the two issues were linked, and asylum seekers arriving on boats were contributing to population growth. The government was able to tap into public concerns about migration to sell its message about population.

Opposition leader Tony Abbott was also quick to jump into the debate. The Coalition first proposed setting a target-band for migration and renaming the Productivity Commission as the Productivity and Sustainability Commission to monitor and manage population growth. The Coalition later announced it would restrict migration to 170,000 a year. And Abbott's 12-point Action Contract, a centrepiece of his campaign strategy, promised to 'link population growth to provision or better infrastructure' and 'enforce strict border security and control.'⁵

Concerns about population growth

Of course, the major parties' political statements on population did not come out of a vacuum. Rather, they tapped into long-held public concerns about population growth and the ability of public policy to deal with it. Political figures had already been picking up on what they perceived as their constituents' concerns. Federal Labor backbencher Kelvin Thompson, an outspoken figure on population, had long argued that growth was pushing up house prices, increasing traffic congestion, exacerbating water shortages, and contributing to carbon emissions.⁶ Thompson's sentiments were not confined to the Labor side of politics either. Former Immigration Minister and now Liberal backbencher Kevin Andrews similarly cited road congestion and water shortages as arguments against population growth.⁷

An eclectic range of public figures, academics and journalists such as Pauline Hanson, Bob Carr, Dick Smith, and Bob Brown had begun to voice their concerns about what they saw as out-of-control population growth. Concern about population tended to fall into three main areas: infrastructure and service provision, the environment, and migration and refugees.

Property and planning

The beginnings of the public debate about population growth coincided with a series of interest rate rises and a mini-boom in the residential housing market. House prices continued to climb, and many Australians began to question a situation that saw young and low-income households increasingly locked out of the housing market. Suggestions by Reserve Bank Governor Glenn Stevens that housing affordability could worsen in the coming years further stoked fears among ordinary Australians that housing supply would not be able to keep up with population growth.⁸

Other commentators suggested poor planning policies had led to infrastructure bottlenecks that, combined with population growth, were creating something of a perfect storm. RMIT University Professor Michael Buxton warned that Australian cities were becoming Los Angeles-style sprawls.⁹ Local debates over issues such as the NSW government's plans to increase housing density in Sydney's leafy northern suburbs only served to confirm in the minds of residents worried about population growth that a larger population would undermine the quality of life in our cities and irrevocably damage communities. Complaints about over-crowded public transport networks and roads became a regular feature of talkback radio and public conversations.

Local concerns about infrastructure, transport and housing also fed into the national debate about population. Figures such as Sunshine Coast Mayor Bob Abbott, who argued that the population boom be a 'recipe for disaster' for his local area, dominated local media. At a national level, columnists such as former Hawke government minister Barry Cohen argued that the 'deterioration in the quality of life in our cities is already obvious.'¹⁰

Environmental concerns

Much of the public concern focused on fears about the impact population growth on the natural environment. The Australian Greens, along with organisations such as the Australian Conservation Foundation, argued that population growth would lead to environmental damage. Both groups called on the federal government to reduce migration as a way to slow population growth.¹¹ Similarly, former NSW Premier Bob Carr argued that population growth threatened to take Australia past its natural 'carrying capacity.' Carr suggested that population should be stabilised at 28 million.¹² Entrepreneur Dick Smith argued that population growth would lead to food and water shortages in Australia.¹³ Commentators such as Clive Hamilton also suggested that a larger population would lead to an increase in carbon emissions,¹⁴ while the Sustainable Population Party of Australia publicised its platform of limiting migration between 50,000 and 80,000 people a year, and capping Australia's population at 23 million.¹⁵

Much of the public concern focused on fears about the impact population growth on the natural environment.

Migration

The public debate about population growth has also tapped into long held and widespread public anxieties about migration and asylum seekers, which both major parties capitalised on in the recent election. Beyond the political arena, Monash University academic Bob Birrell gave voice to these concerns, arguing that relying on migration of people with a non-English speaking background to support population growth would irrevocably transform Australia's culture and its neighbourhoods.¹⁶ As *The Australian* columnist Peter van Onselen noted, 'Immigration means more multiculturalism, which not all Australians support.'¹⁷

Answering the critics

There have also been voices in favour of population growth, arguing that public debate has focused on the negative effects of population growth and not on the potentially disastrous effect of population stagnation. States with slower population growth, such as NSW, have had slower rates of economic growth compared with faster growing states such as Victoria and Queensland. While this doesn't necessarily suggest that population growth *causes* economic growth, it does suggest that economic growth and population growth usually go together.¹⁸ Research in the United States shows that an increase of two million people in a city results in an 8% rise in that city's inhabitants' incomes.¹⁹ In Australia, a 1991 report suggested that a 1.35% annual population growth would maximise our per capita income.²⁰

Demographer Bernard Salt, a consistent advocate of population growth, poses a challenge to those who advocate slowing or stopping population growth. They should 'begin by outlining precisely where they would cut spending to compensate for a slower-growing or even contracting tax base.'²¹ Salt refutes the argument that population growth is some sort of Ponzi scheme, arguing that pension and health care reforms would help us meet the costs of population ageing and obviate the need for constant population growth.²²

Immigration and the economy

Others have pointed out that traditionally in Australia, 'high' migration has been a marker of a strong economy. ANU demographer Peter McDonald argues that migration is needed to help fill skills shortages caused by the mining boom, and will enable that sector to continue to grow. Migrants will be needed to fill jobs left by Australian workers who have moved to the mining sector.²³ According to *The Australian's* George Megalogenis, 'In 2006, immigrants accounted for almost all the growth in the labour force.'²⁴ Cutting migration would probably involve cutting the number of overseas students as well as the number of skilled migrants, crippling our education export industry, and exacerbating skills shortages.²⁵

It is not just migration that drives economic growth; economic growth drives migration as well.

It is not just migration that drives economic growth; economic growth drives migration as well. According to Monash University's Andrew Markus, 'what drives immigration programs is the economy, not some magic wand waved by government.'²⁶ Migration levels were high during the global financial crisis, yet Australia didn't experience the same growth in unemployment that other countries with sluggish population growth did. Business groups such as the Business Council of Australia, the Australian Industry Group, and the Australian Chamber of Commerce and Industry were quick to condemn the Opposition's plan to slow migration, arguing that it would lead to skills shortages and reduced productivity.²⁷

The Wall Street Journal Asia argues that Australia should be letting more, not less unskilled workers in to Australia:

Australia doesn't know what skills it will need in the future or who has those skills. If that 'low-skilled' but bright and hardworking teenager from Malaysia can't get into Australia to wash dishes while he goes to night school, he'll one day start a billion-dollar company somewhere else.²⁸

Infrastructure and planning

Other commentators have disputed the idea that the infrastructure of Australia's cities and towns will not be able to cope with sustained population growth. A series of population summits over the past 20 years have found that Australia has the capacity to cope with populations of up to 40 million. Glenn Withers, who chaired one such inquiry for the Hawke government, suggests population will shift away from big cities and along the coastline, reducing the strain on places such as Sydney and Melbourne. He argues that the population booms in Southeast Queensland and coastal NSW show this shift is already

happening.²⁹ University of Queensland Professor Bob Stimson agrees that regional centres along the coast will soak up much of the projected population growth.³⁰

Population Minister Tony Burke says it is not just population growth that drives infrastructure problems—people moving within Australia are also a factor.³¹ Inter-state migration from Melbourne and Sydney to Southeast Queensland and from the East Coast to WA's mining towns is the main cause of infrastructure strains there—not overall population growth. As long as people move within Australia, not just to Australia, we will still need to build new infrastructure.

Some population growth is also inevitable, regardless of policy settings. Queensland Premier Anna Bligh notes that maintaining Queensland's population at current levels would mean requiring nearly 10,000 people to leave the state every year for the next 40 years just to offset natural increase.³² As CIS economist Stephen Kirchner says:

As long as people move within Australia, not just to Australia, we will still need to build new infrastructure.

If population growth, including migration, forces politicians to confront the need for structural reform and greater flexibility in areas such as housing, infrastructure and the labour market, that is all for the good.³³

The environment

Bernard Salt also dismisses the argument that population growth will be environmentally damaging. Salt maintains that the greater focus on environmental planning means future population growth will damage the environment far less than past population growth.³⁴ Julie Novak, Research Fellow with the Institute of Public Affairs, says, 'For many environmentalists, the arguments for a larger population come across as nothing more than some sort of pro-growth corporate conspiracy.'³⁵ Columnist Paul Kelly says that setting a 'carrying capacity' is an 'untenable exercise in imposed utopianism,'³⁶ while commentators such as *The Age* journalist Julie Szego suggest that 'climate change is a red herring in the population debate' and that arguments against population are a triumph of misanthropic NIMBYism.³⁷ The debate about population growth looks set to be long-lasting and controversial. But what will the population actually look like?

The Intergenerational Report

There is no shortage of forecasts for Australia's population growth. Every few years, the Australian Bureau of Statistics (ABS) produces projections of what our population might look like.³⁸ However, the most famous (or perhaps infamous) projection is the Intergenerational Report (IGR). Then-Treasurer Peter Costello circulated Australia's first Intergenerational Report at the May 2002 Budget. Noting that similar reports had recently been commissioned in the United Kingdom, the United States, and New Zealand, as well as by the European Union and the OECD, Costello said that the purpose of the report was to ask:

What challenges will our children and their children have to confront in forty years time? What shape will Australia's finances be in 2042 based on current policies? And what should we do now to prepare for the generations ahead?³⁹

The IGR concluded that population ageing presented the biggest challenge to Australia's prosperity. The proportion of older people was projected to grow, placing increasing pressures on the budget. Fewer taxpayers would have to meet the increasing health and welfare costs of a larger cohort of retirees. The 2002 report projected that Australia's population would reach 25.3 million by 2042, but this figure was not highlighted by the Treasurer in his speech or widely reported in the media.⁴⁰

When Costello released the second IGR in April 2007 he hinted at a pro-population policy.⁴¹ Costello noted that the fertility rate had risen, and suggested that the Coalition government's pro-fertility policies—such as the Baby Bonus—had played a role.⁴² He also noted that an increase in skilled migration had contributed to the growth of the working age population. Due to higher fertility, migration, and life expectancy than the 2002 report had forecast, the 2007 IGR projected a population of 28.5 million by 2050.⁴³ As with the 2002 report, this figure was not highlighted by the Treasurer. Nor was it jumped on by the media. The main focus of both the 2002 and 2007 reports was the projected long-term fiscal deficits as the population ages—not population growth itself.

The 2010 IGR

The third, and the most recent, IGR was released by the Rudd government in February 2010. However, this time the population projections captured the public's attention. Selective use of headline-grabbing figures by Rudd government ministers and Treasury officials as far back as September 2009 ensured that population growth had become a topic of full-blown public debate by the time the report was released.

Selective use of headline-grabbing figures by Rudd government ministers and Treasury officials as far back as September 2009 ensured that population growth had become a topic of full-blown public debate.

In a speech in October 2009, four months before the IGR was released, Treasury Secretary Ken Henry described his pessimism about Australia's ability to cope with a population of nearly 36 million that the report projected and the pressure that such growth would place on infrastructure and the natural environment.⁴⁴ The timing was particularly unfortunate for the Rudd government. A number of unauthorised boats carrying asylum seekers had recently arrived from Indonesia, sparking public debate and criticism of the government's refugee policy and its wider immigration settings. Henry's pessimism seemed to tap into a shared popular unease about population growth and immigration. The media, followed by anti-growth advocates, were quick to jump on Henry's remarks.

On the night of Henry's speech, then Prime Minister Kevin Rudd made a now infamous appearance on the ABC's *7:30 Report*. Presenter Kerry O'Brien segued seamlessly from questioning Rudd about asylum seekers to Henry's population projection and his doubts about Australia's ability to cope. Whether intentional or not, the link was clear: migration and population growth were inextricably linked and unsustainable, and the government would have to do something about it. Rudd, unrepentant, steadfastly maintained that he made 'no apology' for a pro-population growth policy.⁴⁵

The rest of the media were quick to pick up on both Henry's concerns and Rudd's response. The next morning, *The Age* questioned Melbourne's ability to cope with a booming population,⁴⁶ the *Sydney Morning Herald* called population growth 'damaging' to the environment,⁴⁷ and the free commuter paper *MX* suggested that young Australians would suffer due to population growth.⁴⁸ Then Opposition leader Malcolm Turnbull was also quick to weigh into the debate, saying he backed population growth but the Rudd government was ill-prepared for it.⁴⁹ Letters to the editor suggested that population growth had brought the natural environment to the 'brink of collapse,' and that a growing population was the result of the wishes of a few 'megalomaniac politicians.'⁵⁰ In Southeast Queensland, where the population boom was already in full swing, concerns began to emerge that land supply would 'run out.' By then, the debate sparked by the release of the 2010 IGR had ensured that population growth would be firmly entrenched in the upcoming election campaign agenda.

The 2010 IGR's projections

Despite the rancorous public debate that followed the release of the 2010 IGR, little was made of its findings—apart from the projection of 36 million. But the report did make an interesting and valuable contribution to the debate. Over the past 40 years, Australia's population has grown at an average annual rate of 1.4% a year. The IGR projects that this growth will slow slightly to an average annual rate of 1.2% for the next 40 years, assuming that fertility will remain consistent with current levels—about 1.9 babies born per woman. It also assumes that migration will continue at 0.6% of the total population each year, equal to the average migration level for the last 40 years. Under these conditions, population will grow to nearly 36 million by 2050.

The purpose of the IGR is not to predict population size but rather to assess the fiscal implications of demographic change. The IGR projects that the proportion of Australians over the age of 65 will grow to more than 20% of the population in 2050, up from just over 10% now. The proportion of Australians in the labour force will fall, economic growth will slow, and the cost of providing health care and the pension will rise—resulting in a growing fiscal gap where the government's expenditure will exceed its revenue. By 2050, net debt would be 20% of GDP and rising—an unsustainable arrangement that was recognised as such by the 2007 IGR.

Three variables will determine whether these projections are realised and whether the fiscal outlook for Australia is better or worse: productivity, participation and population growth. The IGR argues that productivity must be lifted by improving education and training, improving infrastructure, and through microeconomic reform. Improved participation means boosting the number of working age Australians in the labour force. And population growth will come from both sustained fertility levels and migration.⁵¹

The first part of this report has summarised the recent population debate in Australia and the results of the 2010 IGR. The second part will explain the authors' projections for what Australia's population might look like in the future.

Modelling our demographic future

The purpose of this report is to get a sense of the demographic composition of Australia's population in 2050 in terms of size and age. How will changes in fertility, migration and life expectancy affect our future population?

The federal Treasury, the ABS, and demographers regularly produce projections of what Australia's population might look like in a few decades. These studies are all extremely valuable, and in many ways this report attempts to replicate them. However, by undertaking our own modelling, we have been able to test our hypotheses and make our own conclusions. This section of the report will explain the methodology of the population model, and the following section will explore the findings.

This population model is designed to test the central hypothesis that population growth and population ageing are a trade-off. In policy terms, the trade-off manifests in a number of ways. A younger but more populous Australia will require more investment in housing and infrastructure, but it will also provide the advantages of a faster growing economy, increased labour supply, paying for the demands of an ageing population, and less stress on the health system and pensions. In contrast, an older and less populous Australia will require fewer investments in new dwellings, roads, schools and hospitals, but will place greater stress on the public purse through increased demand for pensions and health care and a narrower tax base.

How will changes in fertility, migration and life expectancy affect our future population?

Methodology

This study calculates 36 different scenarios for a range of fertility rates, migration patterns, and life expectancies.

Fertility rates: Three alternative total fertility rates

Australia currently has a Total Fertility Rate of 1.96, which is slightly below the level required to keep the population stable. The ‘medium’ fertility scenario assumes that this fertility rate will remain constant.

The ‘high’ fertility scenario assumes that fertility will rise to 2.1 babies per woman. This is the ‘replacement rate,’ which developed economies like Australia need to ensure a stable population. Both New Zealand and the United States have a fertility rate close to 2.1, so this is a realistic scenario for Australia.

The ‘low’ fertility scenario assumes that the fertility rate falls to 1.5 births per woman. This is significantly below the ‘replacement rate,’ meaning that without considerable net migration the population would shrink over time. A major fall in fertility would be a reversal of the current trend; however, it is not completely unrealistic. The average fertility rate in the European Union is 1.5. Countries with ‘lowest low’ fertility, such as Japan, Germany and Italy, all have total fertility rates lower than 1.5.

Migration patterns: Four alternative migration patterns

The baseline or ‘medium’ migration scenario assumes total net migration of 143,601 people per year. This is was the total permanent net overseas migration in 2009 according to the Department of Immigration.

The ‘high’ migration scenario assumes an annual net migration of 210,000 people. This is close to the temporary peak in total migration of nearly 300,000 (permanent and temporary) in 2008–09.

The ‘low’ migration scenario assumes net overseas migration of 70,000 a year. This is the number advocated by ‘small growth’ proponents such as Kelvin Thomson, Bob Carr, and Dick Smith—

and is about half the ‘medium’ migration scenario.

Finally, the ‘zero’ migration scenario assumes there will be no migration at all. This is not presented in this report as a realistic scenario (nor is any mainstream commentator advocating it). However, it allows us to examine whether the population would grow even in the absence of migration.

It is worth noting that historically, migration has fluctuated quite dramatically from year to year. When the economy is booming, net migration tends to increase. When it is flagging, net migration falls. It is fair to expect this trend will continue. Therefore, these migration projections should be seen only as a long-term average, not a prescription for the level at which migration should be set each year.

Life expectancy: Three scenarios for longevity

All three scenarios assume that life expectancy will increase. The ‘medium’ life expectancy scenario, which corresponds with Treasury assumptions, presumes that by 2050 life expectancy will be 87.7 years for men and 90.5 years for women.

The ‘high’ life expectancy scenario assumes that by 2050, male life expectancy at birth will reach 91.0 years and female life expectancy 92.8 years. Finally, the ‘low’ life expectancy scenario assumes that by 2050, life expectancy will be 86.4 years for men and 90.2 years for women.

Besides the assumptions underlying the 36 scenarios above, a number of other assumptions had to be made. These are necessarily simplified, and do not take into account fluctuations from year to year or other complexities.

Perhaps least controversially, the **sex ratio at birth** is assumed to be constant at 105 boys born for every 100 girls. This is a long-term pattern in Australia and has been stable and steady for decades. There is no reason to assume this will change in the future.

When the economy is booming, net migration tends to increase. When it is flagging, net migration falls.

Age specific fertility rates, i.e. the age at which women give birth, are also assumed to remain constant. According to the latest available figures,⁵² the current fertility distribution by age groups is:

Age 15–19:	4.34%
Age 20–24:	14.44%
Age 25–29:	26.96%
Age 30–34:	32.51%
Age 35–39:	17.97%
Age 40–44:	3.62%
Age 45–49:	0.17%

The age at which women give birth has been steadily increasing over the past few decades. This trend may continue (although there is a biological limit). However, for the purposes of this exercise the effect of changes in the age at which women give birth would be marginal. Therefore, it is safe to assume there will be no change.

The **age distribution of net migrants** is assumed to be the same as the age distribution of *incoming* migrants to Australia. This is because neither the Department of Immigration nor the ABS provides information on the age profile of *net* migrants. There is almost certainly some variation between the two, but in the absence of any data this seems to be the most plausible assumption to make. It should also be noted that this does not change the total *number* of net migrants.

The **sex ratio of net migrants** is assumed to stay constant at 47.28% male and 52.72% female.⁵³ In all scenarios, this is assumed to remain constant.

Age specific mortality rates are based on the Coale-Demeny life tables, which provide mortality rates for life expectancies in five-year gaps up to 80 years. Any life expectancy above this age is extrapolated from the difference between the 75 and the 80 column of age-specific life expectancy.⁵⁴

Politicians, demographers and policy researchers do not know how fertility will change in the future or what medical breakthroughs will allow us to live longer.

Software

The 36 scenarios were calculated using the DemProj module of a demographic modelling program called 'Spectrum.' Spectrum was developed by the Futures Institute with the support of USAID, the Bill & Melinda Gates Foundation, the United States Fund for UNICEF, UNAIDS, the World Health Organization, and UNICEF. The authors gratefully acknowledge the willingness of the Futures Institute to make Spectrum available to the wider research community free of charge. The authors corresponded with the research team of the Futures Institute, especially on the issue of age-specific mortality rates, and the solution applied is based on one of their recommendations.

Caveats

In many respects, these assumptions about fertility, migration and life expectancy are arbitrary. Politicians, demographers and policy researchers do not know how fertility will change in the future or what medical breakthroughs will allow us to live longer. Nor can they predict the migration policy of future governments. No model can adequately reflect future uncertainties. Different migration patterns might lead to different fertility patterns if migrants are younger and come from a higher fertility culture. But this is not a certainty. To date, migrants' fertility rates have converged towards the national average.⁵⁵ Examples such as this simply highlight the uncertainties with any demographic modelling. The models necessarily assume that patterns such as birth rate and migration remain constant over time when, in reality, they are constantly fluctuating. Since the future is fraught with uncertainty, forecasting will never be an accurate science.

Therefore, the projections in this report are in no way intended to be a *prediction* of what Australia's population will look like. Yet it is a valuable exercise—not because

Australia’s population could look quite different in 2050, depending on what its migration levels, fertility, and life expectancy are.

it tells us how big or old Australia will be in the future but because it demonstrates the effects of changes in fertility, mortality and migration on population growth and ageing.

Whether the results accurately predict the nature of population growth or the assumptions accurately reflect the current situation is largely irrelevant.

This report aims to compare the broad alternatives through demographic modelling. The findings are broadly consistent with those of the ABS and the Treasury in its Intergenerational Reports, suggesting that the assumptions are largely accurate and the results are reliable. The following section will explore our results and examine what might happen to Australia’s population size and age structure in the next few decades.

Findings

Finding 1: Australia’s population is going to get bigger and older under most realistic scenarios.

The current debate about population is focused on the size of Australia’s population in the future. These demographic projections confirm the popular impression that Australia is growing. Under all of the 36 scenarios except one, Australia’s population will be larger in 2050 than it is now. However, the projections also highlight another aspect of Australia’s changing population that doesn’t feature in the current debate: ageing. Under each scenario, Australia’s population will also be older in 2050 than it is today. Table 1 shows both the total population size (in the white boxes) and the median age (in the grey boxes) in 2050 in each of the 36 scenarios.

Table 1: Australia’s population size and median age in 2050 under 36 demographic scenarios.

Assumptions	Low life expectancy			Medium life expectancy			High life expectancy		
	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility	Low fertility	Medium fertility	High fertility
Zero migration	49.2	43.1	41.4	49.3	43.3	41.6	49.9	43.8	42.1
	21.5m	24.9m	25.9m	21.6m	25.1m	26.1m	22.0m	25.8m	26.5m
Low migration	47.2	41.7	40.2	47.4	41.9	40.4	47.9	42.4	40.8
	25.2m	29.0m	30.1m	25.3m	29.1m	30.2m	25.8m	29.6m	30.7m
Medium migration	45.8	40.7	39.4	45.9	40.9	39.5	46.4	41.3	39.9
	29.1m	33.3m	34.5m	29.3m	33.4m	34.6m	29.8m	33.9m	35.1m
High migration	44.8	40	38.8	44.9	40.2	38.9	45.3	40.6	39.3
	32.7m	37.1m	38.4m	32.8m	37.3m	38.6m	33.3m	37.8m	39.1m

population size
 median age
 most likely scenarios

Australia’s population could look quite different in 2050, depending on what its migration levels, fertility, and life expectancy are. With ‘high’ migration, ‘high’ fertility, and ‘low’ life expectancy, the median age will have risen to just 38.8 in 2050 (up from 37.3 today), but the population will have grown to 38.4 million. Conversely, the population could remain at its current size of 22 million in 2050 if there is ‘zero’ migration, ‘low’ fertility, and ‘high’ life expectancy—or it could even drop to below 22 million if we have lower life expectancy.

But under this scenario, the median age would be 49.9 years in 2050—much older than the ageing societies of Japan (44) and Italy (43) are today. In contrast, the younger and growing United States has a median age of only 36.7. Of course, not all of these scenarios have the same chance of actually materialising. Where we end up is not a lottery with 36 balls, one of which is picked at random. Some scenarios are much more likely than others.

Discarding the 'optimistic' and the 'pessimistic' life expectancy scenarios leaves only 12 scenarios. In this modelling, changes in life expectancy only have a marginal effect on the total population size and median age. Moreover, life expectancy is the lever over which governments have the least control. Big improvements in life expectancy are likely to come from medical breakthroughs, which are difficult to predict and even more difficult for policymakers to plan for and control.

Remove the 'zero' and 'high' migration scenarios (there are hardly any people advocating either of them) and only six scenarios remain. These are in bold in Table 1. Within these six scenarios, the spreads in population size and median age are still substantial, but they are smaller than before. Population in these middle-of-the-road scenarios ranges from 25.3 million to 34.6 million people, while median age is between 39.5 and 47.4 years. This suggests that, in all likelihood, Australia will experience some population growth and ageing even with substantial cuts to migration or changing fertility rates.

These six scenarios demonstrate that both migration and fertility play a major role in demographic change. A drop in fertility to the current EU average of 1.5 would result in a much older population: 45.9 years in the 'medium' migration scenario and 47.4 years in the 'low' migration scenario. If that were to happen, even keeping our current migration levels would not be able to prevent a dramatic increase in the median age. Even under the 'high' migration scenario, the median age will rise to nearly 45 if the fertility rate falls.

Conversely, a jump in the fertility rate to 2.1 (the 'replacement rate,' currently being experienced by the United States and New Zealand) means that population ageing will happen at a much slower rate—regardless of the size of the migration program. Under a 'medium' migration scenario with 'high' fertility, Australia's median age will rise to 39.5—much lower than the current median ages of many European societies. Even with 'low' migration, 'high' fertility would mean our median age would rise to only 40.4 years in 2050.

The other conclusion: the difference in population size between 'business as usual' migration and a cut of net migration by half would only be an extra four million people by 2050. If our fertility rate remains stable, we will have a population of 33.4 million in 2050 under a 'medium' migration scenario compared to 29.1 million people under a 'low' migration scenario. Four million extra people may seem like a lot, but such an increase is quite manageable over a period of four decades. Moreover, the difference is not as dramatic as advocates of cutting migration levels claim. Even if we cut migration dramatically, we still need to prepare for a very substantial change in Australia's population.

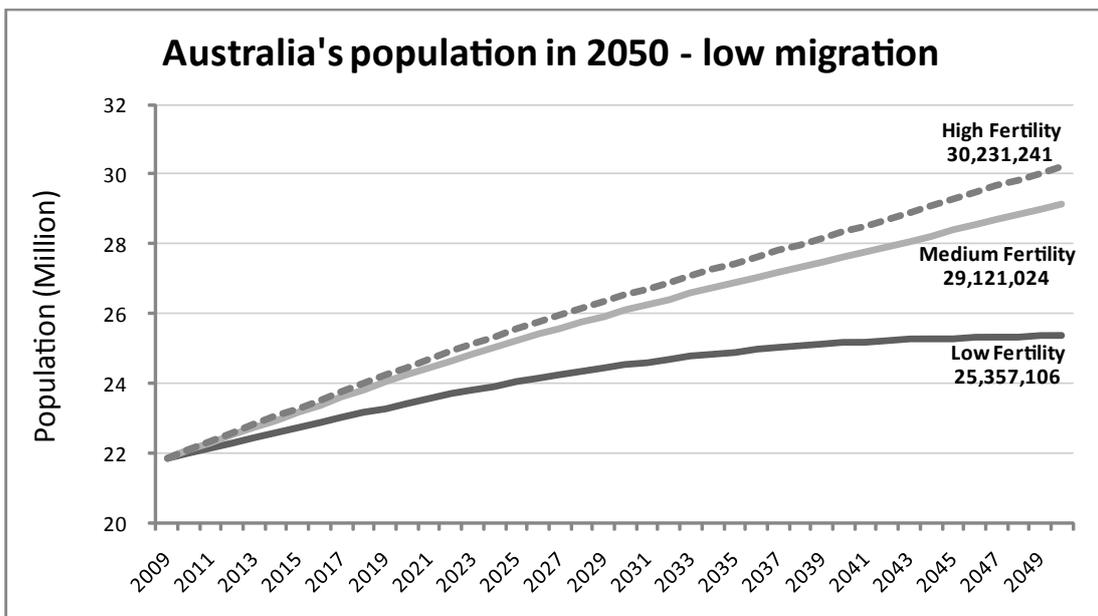
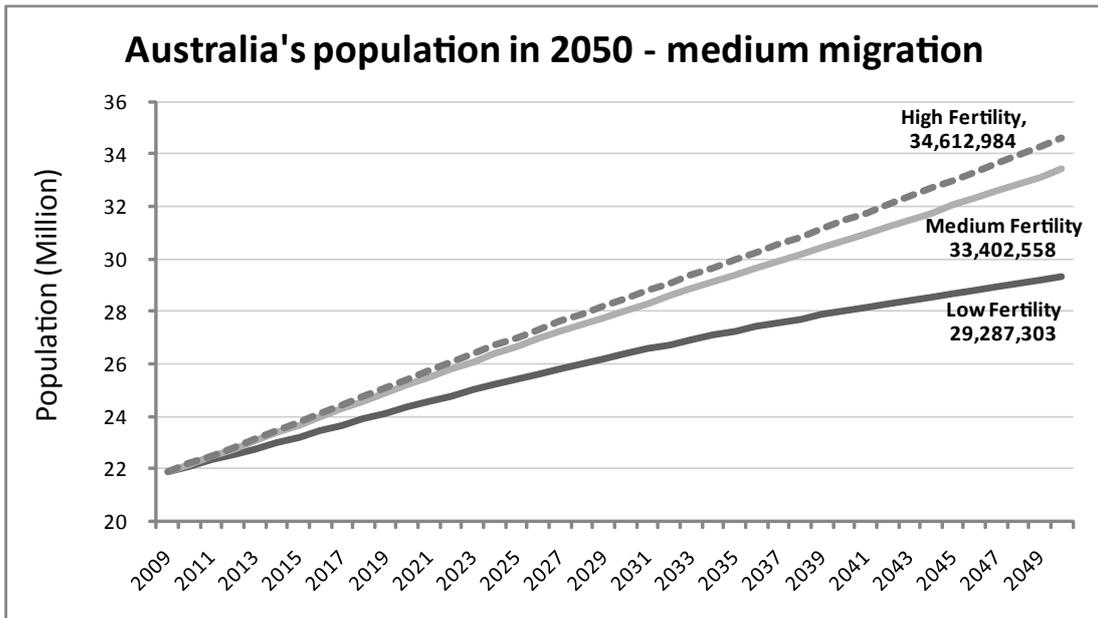
In all likelihood, we have to expect ageing and population growth for the coming decades. The question is not whether it's going to happen but by how much will it happen.

The difference in population size between 'business as usual' migration and a cut of net migration by half would only be an extra four million people by 2050.

Finding 2: Both migration and fertility have a big impact on future population size, making it hard to determine exactly what the future population will be.

Many supporters of curbing population growth argue that by adopting their policies, Australia's population size could be frozen or stabilised. However—unless we cut net overseas migration to zero—this argument is not feasible.

Figures 1 and 2: Projections of Australia’s future population size



Under both the ‘medium’ and ‘low’ migration scenarios, Australia’s population will be bigger in 2050—how much bigger will depend on fertility. Even under the ‘low’ migration/‘low’ fertility scenario, population would continue to increase before stabilising at around the 25 million mark. Under all of the most likely scenarios, even those that assume reduced migration, Australia’s population will continue to grow in the foreseeable future. If fertility remains stable or increases, the population could grow quite substantially—even under ‘low’ migration scenarios.

It is particularly striking to see how the final result regarding population size depends on both migration and fertility. If we cut migration dramatically but the fertility rate remained stable, the population would reach about 30 million by 2050. Conversely, if we maintained ‘medium’ migration but our fertility rate fell, the population would increase to about 30 million by 2050. To advocate that migration policy is a lever with which we can easily adjust long-term population figures is misleading. In the long run, fertility is at least as relevant as migration, if not more.

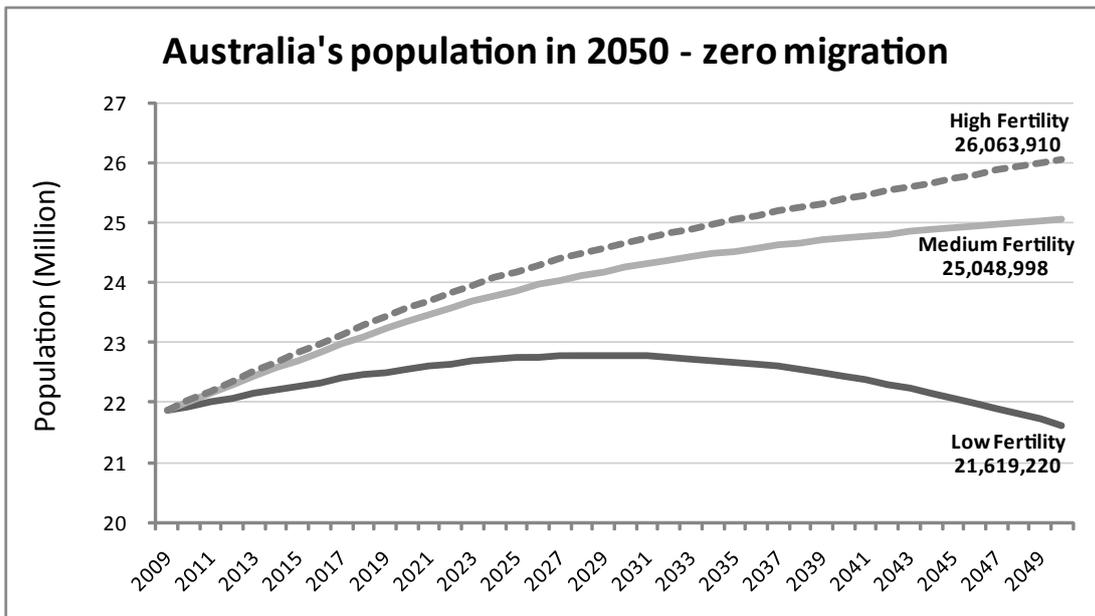
Finding 3: A zero migration scenario could result in population decline.

One scenario would keep Australia's population near today's levels: 'zero' migration coupled with 'low' fertility. It is worth noting, however, that this is an unrealistic scenario and next to impossible for government to achieve. Keeping Australia's net migration at zero would probably mean cutting all skilled migration, not allowing students or working holiday makers to enter the country, stopping Australians who marry overseas from bringing their spouse and children back to Australia, freezing the humanitarian program, and severing the agreement that allows New Zealanders to work in Australia. For this reason, even the most ardent mainstream proponents of slowing Australia's population growth do not advocate zero net migration. Zero migration combined with 'low' fertility would also result in a quickly ageing Australia.

The 'zero' migration scenario is useful only in as much as it shows the absolute minimum—if there is *any* migration at all, the population will be larger than these projections. Even in this scenario, the population would grow marginally for about 20 years before going into decline. This is because Australia currently has what demographers call a 'momentum for growth' or 'growth that would occur even if fertility [and in Australia's case, migration] were to stabilise universally and immediately at the replacement level.'⁵⁶ The ageing baby boomer generation is much larger in number than the older age cohorts it is replacing. This means population will continue to increase (and age) as this group moves into retirement and old age over the next few decades. Figure 2 shows this 'momentum for growth' will continue until the late 2020s, after which the population would begin to fall. Note, however, that under 'medium' or 'high' fertility, even 'zero' migration would result in some population growth as the population got older. Under these assumptions, there would be enough babies being born to offset the death of older Australians.

Australia currently has what demographers call a 'momentum for growth' or 'growth that would occur even if fertility were to stabilise.'

Figure 3: Australia's projected population with zero migration



Findings 1–3 show that Australia's population is likely to be larger in 2050 than it is today. Under only one (extremely unlikely) scenario—'zero' net migration and 'low' fertility—will Australia's population fall. However, the various other scenarios show that Australia's population in 2050 could be a little bit larger or a lot larger. If migration is cut and fertility falls, we will only have about 2 million extra people. If we have 'medium' migration and 'high' fertility, we will have an extra 12.5 million people. And, if we have 'high' migration and 'high' fertility, we will have an extra 17 million people.

The extent to which governments can influence fertility is hotly contested.

But these headline figures don't tell us anything about the age composition of the population. We already know that Australia is going to get older, no matter what happens with migration and fertility. This is an important policy consideration. An older population means there will be proportionally fewer people of taxpaying age to meet the pension, aged care, and health care costs of proportionally more people of retirement age. Treasury projects that at current levels of population growth and ageing, the cost of providing these services will be \$60 billion a year more in today's terms by 2050—meaning government spending will rise to more than 27% of GDP.⁵⁷ A younger population means these costs will reduce; an older population means they will increase. But what impact do migration and fertility have on population ageing?

Finding 4: Fertility levels have the biggest impact on population ageing.

With improving life expectancy, Australia will get older no matter what. However, changes in fertility levels—not changes in migration—will have the largest effect on slowing down or speeding up population ageing. Figures 4 and 5 show the projected change in Australia's median age under both the 'medium' and 'low' migration scenarios. Tellingly, there is not a great deal of difference between the two. Migration is certainly no silver bullet for alleviating population ageing. In both the 'low' and 'medium' migration scenarios, it is fertility that makes the biggest difference to median age. If the fertility rate remained constant, the median age would rise to 41.5 under a 'medium' migration policy and 42.5 under a 'low' migration scenario. If fertility increases to the replacement rate of 2.1, the difference between these two scenarios is even smaller—40.1 years compared to 40.9 years. And if the fertility levels dropped to 1.5, Australia's median age would reach 46 years regardless of a net migration intake of 70,000 or 150,000. If politicians are concerned about population ageing, they should be looking carefully at fertility levels rather than migration levels. However, the extent to which governments can influence fertility is hotly contested. While some demographers such as Peter McDonald have found that fertility levels are closely associated with family support policies,⁵⁸ other studies in Australia and overseas have found that government interventions to encourage a higher birth rate have only been marginally successful, if at all.⁵⁹ For example, the Productivity Commission found that it was improved economic conditions—not the Howard government's Baby Bonus for new parents—that led to the rebound in Australia's birth rate in 2000s.⁶⁰

Figure 4: Australia's median age under different demographic scenarios

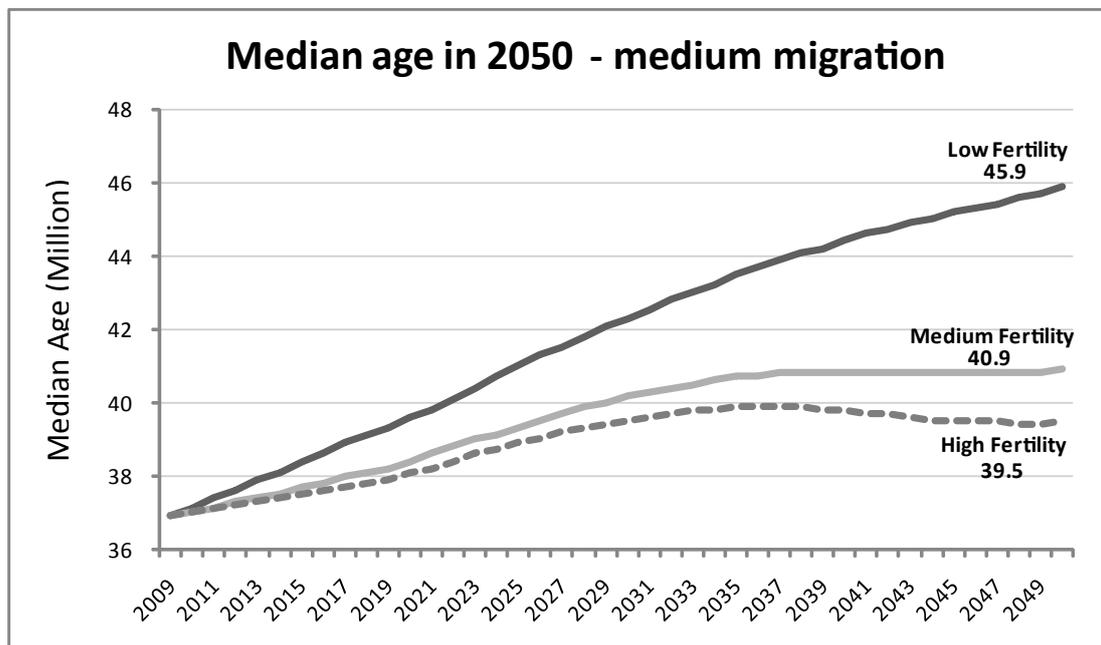
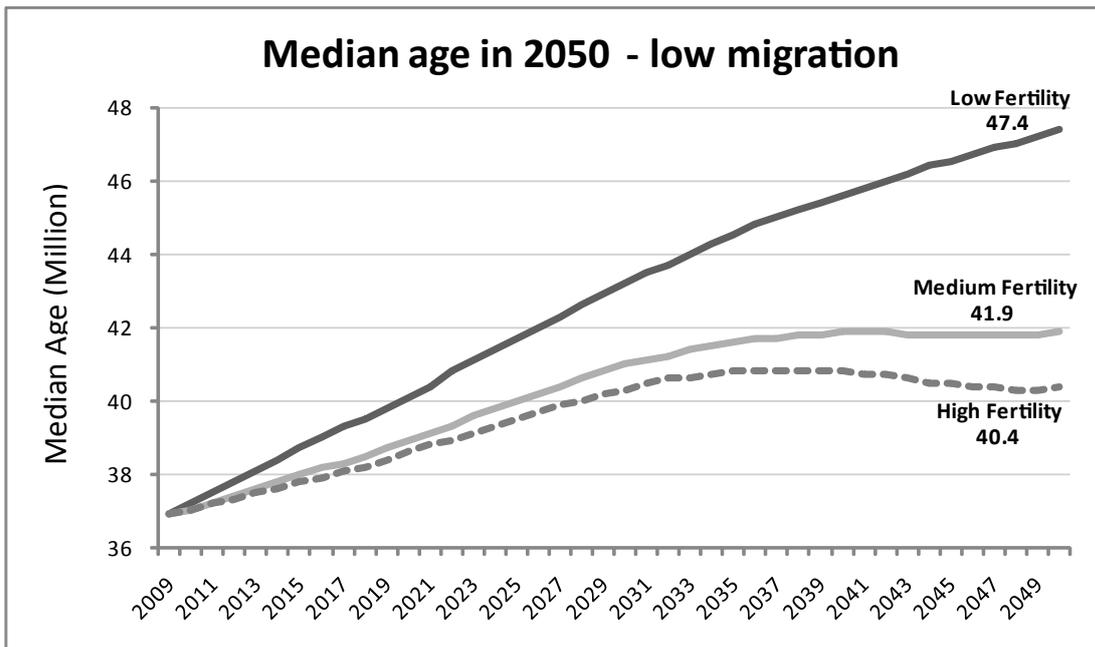


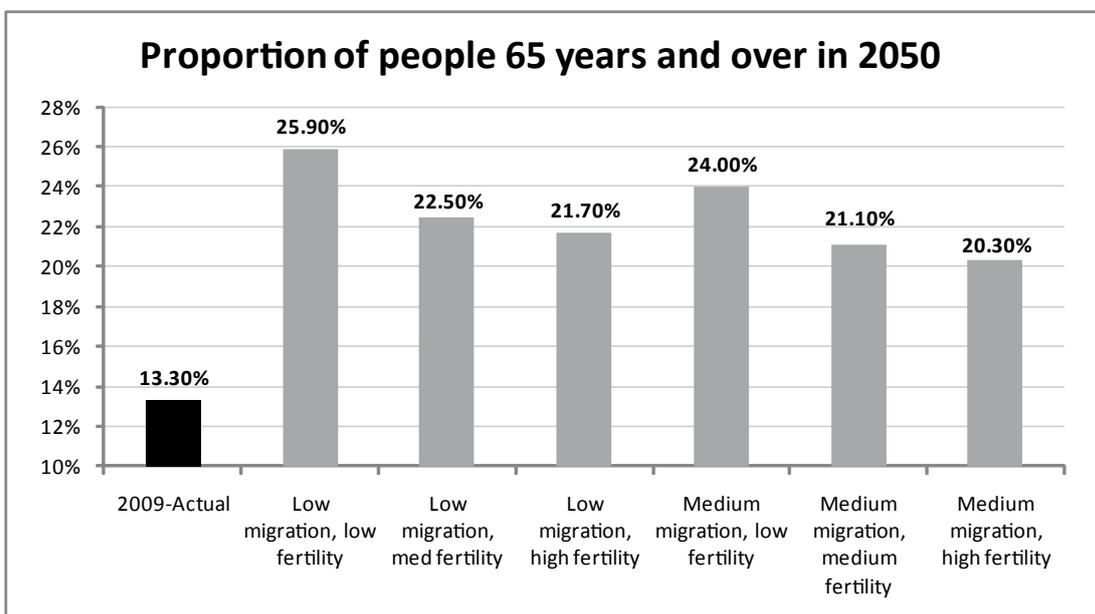
Figure 5: Australia's median age under different demographic scenarios (cont.)



Finding 5: Both the number and proportion of older Australians will more than double by 2050.

While the number of young Australians in the future is far from assured, we can be much more confident in concluding that the number of older Australians will substantially grow. In 2009, just over 13% Australians were over the age of 65. Under every scenario, this proportion is set to rise, and will reach more than 20% by 2050 under the most realistic scenarios. As Figure 6 shows, different fertility and migration patterns will speed up or slow down the process of population ageing—but this impact is only marginal. Higher fertility and higher migration can both ameliorate the ageing process, but they cannot stop it. However, the marginal differences are not trivial: the difference between the lowest of the six most likely scenarios and the highest is about one-fifth.

Figure 6: Proportion of Australians 65 years and older in 2050



Of course, as Peter McDonald and Rebecca Kippen note, ‘the definition of ageing as a problem is not simply driven by the fact that the population is getting older but also by the ways in which we have organised institutions in the society that relate to ageing.’⁶¹ It will not matter what proportion of people are over 65 in 2050, if by then, the pension age is 70 and most people in their late sixties are still in the workforce and form part of the tax base.

While Australia’s total population won’t double, the combination of growth plus ageing means the numbers of very elderly Australians will more than double.

However, the combination of population growth and population ageing means that whatever policy settings the government puts in place around pensions, aged care, and health care, Australia still needs to deal with an ever increasing number of much older Australians. Currently, there are about 820,000 Australians aged 80 or over. By 2050, this number will double—again, regardless of changes in fertility and migration. And, while it makes sense to set aside life expectancy for simplicity’s sake in the other calculations in this report, changes in mortality rates can make a big difference to the number of people aged 80 or over.

In a ‘medium’ life expectancy/ ‘medium’ migration scenario, there will be almost 2 million Australians over the age of 80 by 2050. Even if migration is halved, there will still be 1.9 million people over 80. If life expectancy increases, there will be more than 2.1 million

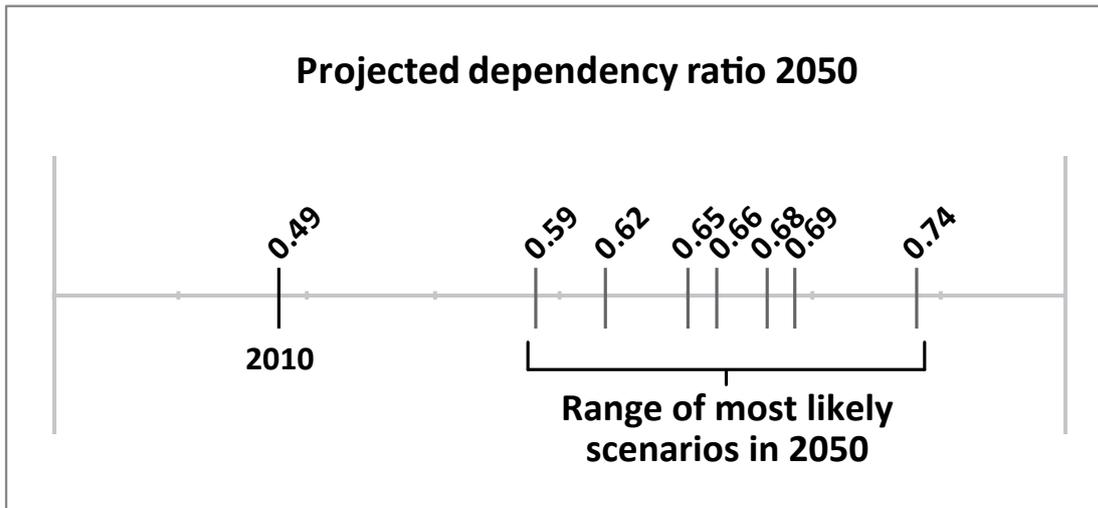
Australians aged 80 or over in 2050—or even 2.2 million if migration is high. While Australia’s total population won’t double, the combination of growth plus ageing means the numbers of very elderly Australians will more than double. This will have huge implications for aged care and health care policy.

Finding 6: Population ageing means there will be proportionally fewer workers and taxpayers in the future.

The proportion of Australians who are of working (and taxpaying age) will also decline in the future under all scenarios. Figure 7 shows a range of projected dependency ratios. The dependency ratio expresses the relationship between the working age and non-working age population. If population growth means more elderly Australians or more children, then the pressures on the working age population to fund public services will increase. Based on our calculations, the dependency ratio currently stands at just below 0.5. For every child or person of retirement age, there are two Australians of working age. Put another way, each working age person’s taxes must support half of a dependent person—be they either a child or person of retirement age. But with an ageing population, this ratio will get higher. How much higher depends on both migration and fertility. Under the most optimistic of the 36 scenarios, the dependency ratio will rise to 0.59. This means each working age person’s taxes will need to support about 60% of a dependent person. However, to achieve this dependency ratio, we would need to have ‘low’ fertility (less children), ‘low’ life expectancy (less elderly people), and ‘high’ migration (more working age migrants). This scenario *really is* a type of Ponzi scheme. More migrants would be needed each year just to keep the dependency ratio stable. It would be unsustainable and unrealistic.

In all likelihood, the dependency ratio will be quite a bit higher than this. In the six ‘most likely’ scenarios (assuming ‘medium’ life expectancy, ‘low’ or ‘medium’ migration and ‘varying’ fertility) discussed in this report, the dependency ratio would reach between 0.62 and 0.69. ‘Low’ fertility means that the dependency ratio will be lower because of fewer children, but it will also mean the population will be older. Under the least optimistic scenario of ‘high’ fertility, ‘high’ life expectancy, and ‘zero’ migration, the dependency ratio would reach 0.74 by 2050—meaning that for every three working age Australians, there would be two dependents.

Figure 7: Dependency ratios in 2050.



These scenarios demonstrate, however, that there are limits to using the dependency ratio as a demographic measure. The dependency ratio doesn't explain whether those dependents are children or elderly. If our concern is population ageing, then a 'high' birth rate is a good thing. More babies mean more future taxpayers to support their parents in retirement. But in terms of dependency ratios, 'high' fertility looks like a mixed blessing—at least in the short term.

No matter what happens with life expectancy, migration and fertility, there will be more demands on taxpayers to fund public services—whether they are health care facilities for the elderly or schools for the young. Participation rate (the proportion of people over 15 who are actually in the workforce) currently stands at about 65%. However, Treasury projects that population ageing means this will fall. Workforce participation among Australians of working age will need to increase to offset the growing dependency ratio.⁶²

Discussion and conclusion

Population growth and population ageing affect so many areas of public policy—from infrastructure, transport and housing, to water and energy, to health and hospitals, to pensions and of course migration. The demographic projections in this report make some preliminary policy conclusions clear. There are no easy choices for Australia's demographic future and keeping the nation young and vibrant while limiting the pressures on infrastructure and housing resulting from population growth. Under every realistic scenario, both population growth and population ageing will happen. Either Australia's population will grow substantially or the country will see a substantial increase in the median age. In policy terms, this means Australia must spend a considerably larger share of its national income on health and aged care, or spend a large amount of money on providing more infrastructure. It also means that politicians who promise to limit population growth will need to explain to the electorate how they plan to deal with the associated increase in population ageing.

There remains, however, one fundamental problem inherent in all population policies: the incredibly varied results we achieved across the 36 scenarios demonstrate that small changes in underlying assumptions can lead to vastly different outcomes. Because we can't know exactly what the life expectancy or fertility rates will be in the future, and because migration levels fluctuate from year to year depending on economic conditions, no one can accurately predict the future of Australian demography. For this reason, it is unrealistic to set a target level for future population. Even with the draconian use of the few policy instruments that are available, it would be very hard to predict with any accuracy.

Under every realistic scenario, both population growth and population ageing will happen.

It follows from this that any grand overarching plan or strategy designed to calibrate current public policy to future population will have shaky foundations. Australia's demographic future can't be planned for, but we can make existing institutions more flexible to better cope with whichever population scenario emerges. Because of the 'momentum for growth' in Australia's current population, Australia's population *will* grow. It is therefore prudent to ensure we have a flexible policy environment to create the right processes and institutions to deal with the challenges of population growth and ageing. There is no right or wrong population size or rate of population growth, but there are right and wrong policies for dealing with these challenges.

This is where the real debate about population should be—it should be about housing, hospitals, roads, pensions, the natural environment—all the things we urgently need to plan for a growing and ageing Australia. The debate should not be about whether we should have a 'Big Australia' or a 'Small Australia' but about how we can make a growing Australia work and how we can make it a prosperous and liveable place for us all.

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- ⁶² However, McDonald and Temple show that productivity increases alone will be insufficient to meet the increased demand for labour that will result from population ageing. Continued skilled migration will also be required. See Peter McDonald and Jeromey Temple, *Demographic and Labour Supply Futures for Australia* (Canberra, Australian Demographic and Social Research Institute: 2008).

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