

Future of work environmental scan – demographic and labour force change

Introduction

This paper discusses the implications of predicted changes to New Zealand's population and labour force on the future public workforce. Social and technological factors that may drive change are discussed in the accompanying papers. The primary focus is on the implications for the core Public Service workforce¹, although some analysis of the wider public workforce is provided where relevant.

The paper first sets the stage by discussing the aspects of the public workforce that are relevant to demographic and labour force change. These are:

- The public workforce is vital to New Zealand, both in terms of its size and the importance of the services it provides New Zealanders.
- The public workforce is more highly educated, on average, than the private sector.
- The age profile of the core Public Service workforce has changed over the last 15 years, with relatively fewer employees in the 35-44-year age ranges.
- This was driven by the aging of the population, but another factor was reduced hiring and retention in the years after the Global Financial Crisis (GFC). Workforce demand is cyclical, like many other sectors. A recent increase in graduate recruitment has gone some way to balancing the ageing of the core Public Service workforce.
- The demand for public services is increasing, as New Zealand's population grows at its fastest rate in 50 years.

The paper then summarises the key demographic and labour force shifts that are likely to impact the public workforce. These are:

- The New Zealand population will continue to age into the long-term.
- Population growth is projected to be higher than the growth in the New Zealand-born labour force.
- Based on current trends, the growth in the university pipeline will not be sufficient to supply the public workforce with the skills it needs.
- Increasing life spans mean that people can work for longer periods.
- Migration has increasingly been used to meet workforce demands.
- There is a long-term trend of increasing demand for higher-level skills, in response to technological change.
- Increased ethnic diversity in the New Zealand population is expected to continue.
- Population and diversity growth will be unequally shared across regions.

The paper then talks about the implications of these shifts on workforce capability and capacity. Over the next 10 years there will be a continued need to rely on immigration to meet workforce needs. There is also scope to improve the retention of older public employees through increased flexibility, retraining and workplaces that

¹ The core Public Service workforce refers to employees of departments listed on the Schedule 1 of the State Sector Act 1988, including employees of departmental agencies listed on Schedule 1A. The wider public workforce refers to employees of all central government organisations.

better accommodate the needs of employees with disabilities. In the longer-term, looking for solutions to workforce pressures could include a combination of:

- Targeted use of immigration for key skill shortages.
- Improving the public service employment brand to attract university graduates and diverse younger New Zealanders.
- Making productivity gains through new technology, new service models or workforce innovation.

The paper ends by discussing ways to improve information on the public service workforce. These include:

- A longitudinal database of core Public Service employees, to allow a longitudinal view of career pathways and capability development.
- Building an information collection system behind the jobs.govt.nz portal to improve understanding of diversity and skills shortages.
- Running a core Public Service workforce census to fill information gaps that administrative data cannot provide (e.g. capability, learning and development, inclusive workplaces).
- Modelling and forecasting to improve capacity and capability strategic planning.
- More integrated data on the whole-of-state sector, including better information on the funded workforce.
- Agreement on key high-level indicators to monitor the state of the public workforce.

The paper is the result of a desktop-based review of relevant quantitative data. It focuses on recent trends to identify the key demographic and labour force shifts that are likely to impact the public workforce. There is always uncertainty around the extent to which recent trends will continue into the future, given factors such as technological change and the impact of events such as COVID-19. For example, there is a range of possible future demographic states. This paper uses the midpoint projections from a range of projections that Stats NZ produces. These midpoint projections tend to underestimate New Zealand's recent population and migration growth.

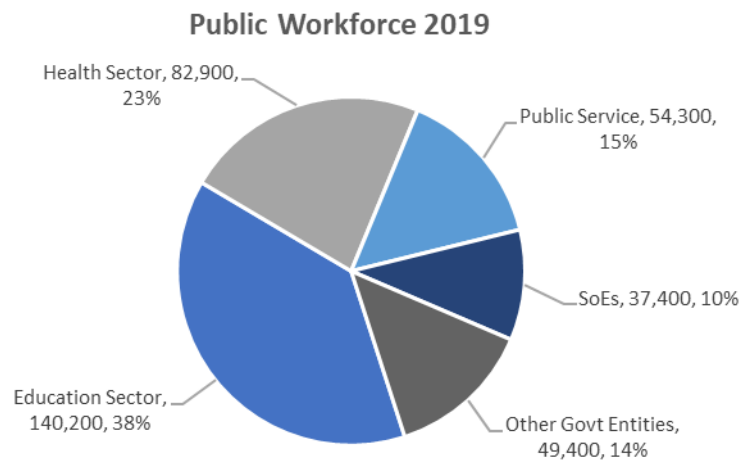
Relevant aspects of the public service workforce

The public workforce is vital to New Zealand

The public workforce provides critical services to New Zealanders. Some of these services are provided directly to citizens, such as those provided by the health, education and social sectors. Other public services, such as regulatory enforcement and policy advice, are less direct but also have potentially large impacts on the wellbeing of New Zealanders.

Due to the nature of its outputs, it is difficult to capture the importance of public services in standard economic measures, such as GDP. In terms of workforce size, central government had around 364,000 jobs as at February 2019, nearly one in six (16%) of all New Zealand jobs. This share has been relatively stable over the past twenty years. Note that this share does not include the parts of the private sector workforce which are publicly funded to provide public services (e.g. in health and early childhood education). The relative lack of accurate data on this 'contracted out' workforce compromises our understanding of the workforce capacity and capability of public services.

The following chart shows how the public workforce is distributed by sector in 2019.

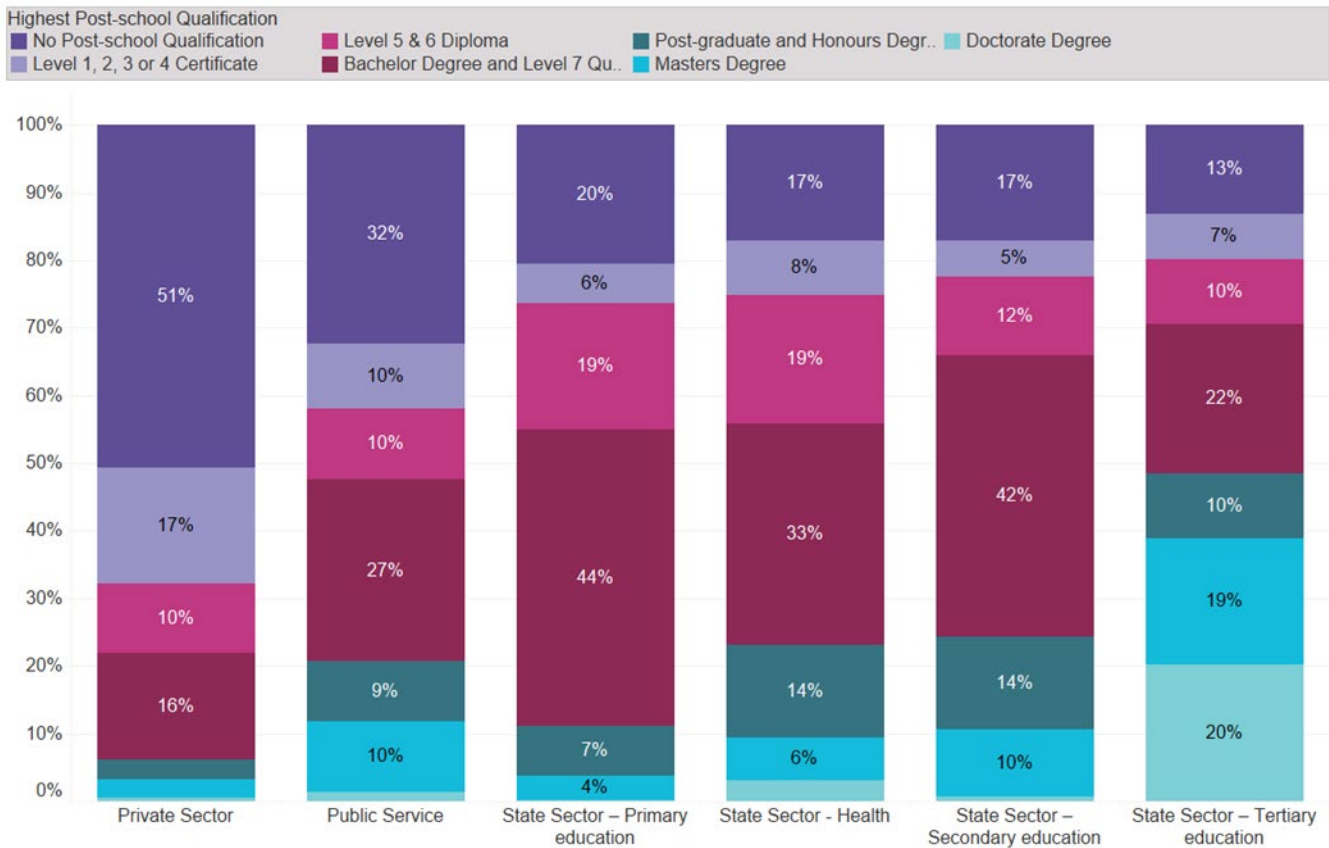


Source: Stats NZ Business Demography and SSC Workforce Data

The public workforce is highly skilled

The public workforce is more qualified, on average, than the private sector. This is particular true for the education and health sectors (as shown in the following chart). This suggests that the public workforce has higher skill needs than other sectors and is a major customer of the tertiary education sector.

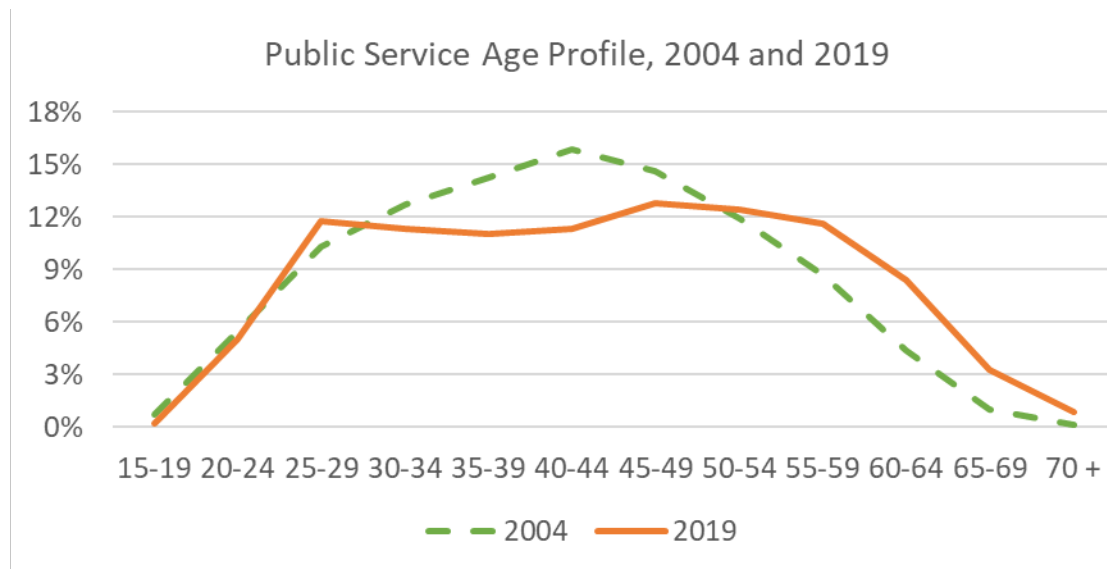
Highest post-school qualification by sector



Source: Stats NZ - Census 2013

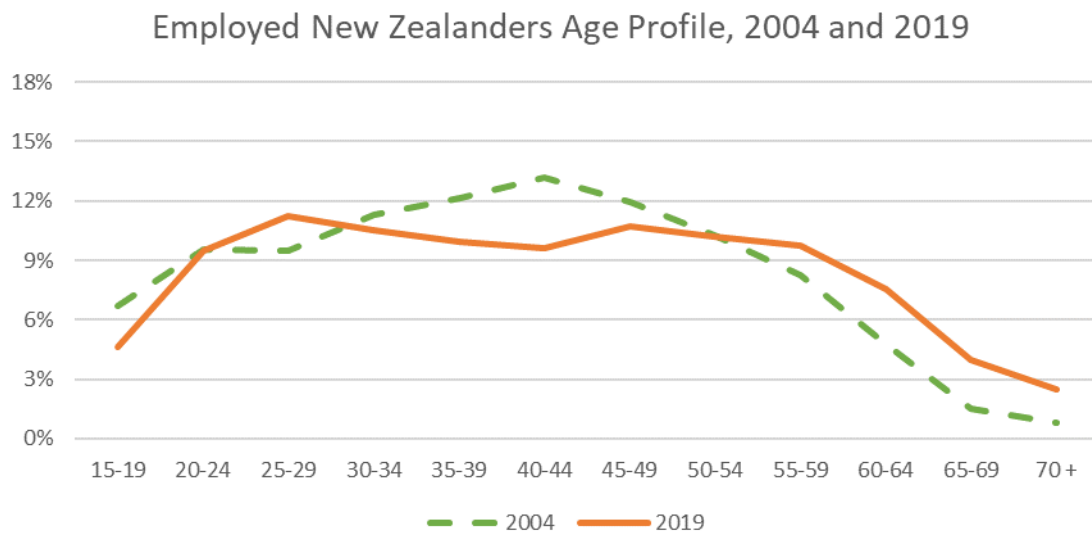
The core Public Service age profile has changed

As the New Zealand population has aged, so has core Public Service workforce. This can be seen in changes to the age profile of the Public Service (see chart below). Although recruitment has spiked in recent years, there are still relatively fewer employees in the 35-44-year age ranges and this may point to capacity and capability constraints in the next decade. For example, anecdotally, there appears to be concern that there are not enough experienced / highly capable 'senior advisors' currently. As the 35-44-year cohort ages, this issue may move to the 'principal advisor' or manager level.



Source: SSC Workforce Data

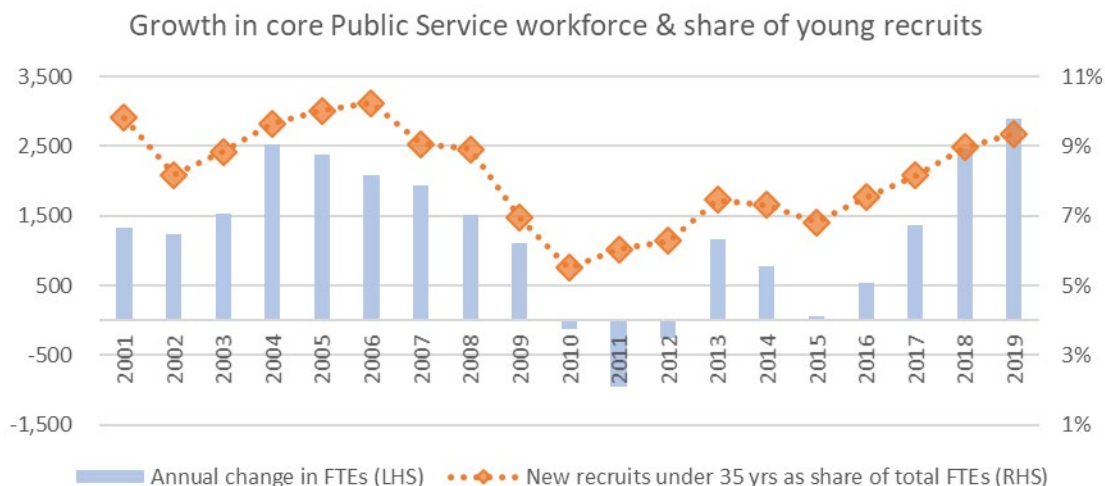
These changes are occurring across the entire New Zealand workforce. The age profile of the New Zealand workforce as seen an almost identical change. Overall, the average age in the core Public Service in 2019 was around two years older than for all employed New Zealanders.



Source: Stats NZ Household Labour Force Survey, June Years

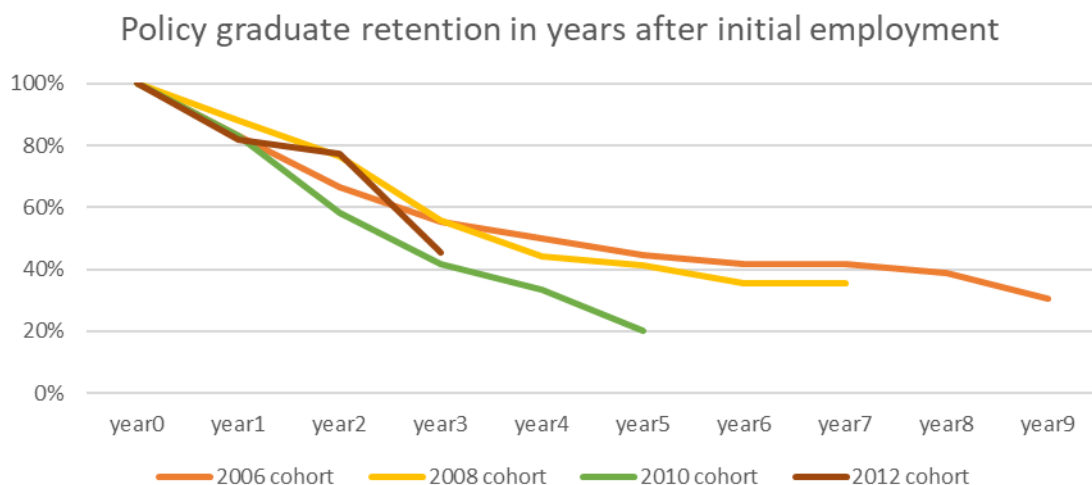
Core Public Service workforce demand can be cyclical

Like many other sectors, workforce demand in the core Public Service varies across time. Workforce demand fell in the years after the Global Financial Crisis (GFC), as is shown in the following chart. The intake of young recruits was also affected.²



Source: SSC Workforce Data

Evidence suggests that the retention of policy graduates in the core Public Service was lower for those hired in years post-GFC, than those hired in years when the workforce was expanding (see chart below). This may point to lower investment in young recruits (e.g. graduate induction programmes) when hiring is low and/or money is tight.



Source: SSC Human Resource Capability 2016 & Stats NZ IDI

² Note that the share of new recruits under 35 years in the chart is an over-estimate of the true rate. This is because new recruits are measured at an agency level, so the rate captures some young employees who have moved from one agency to another.

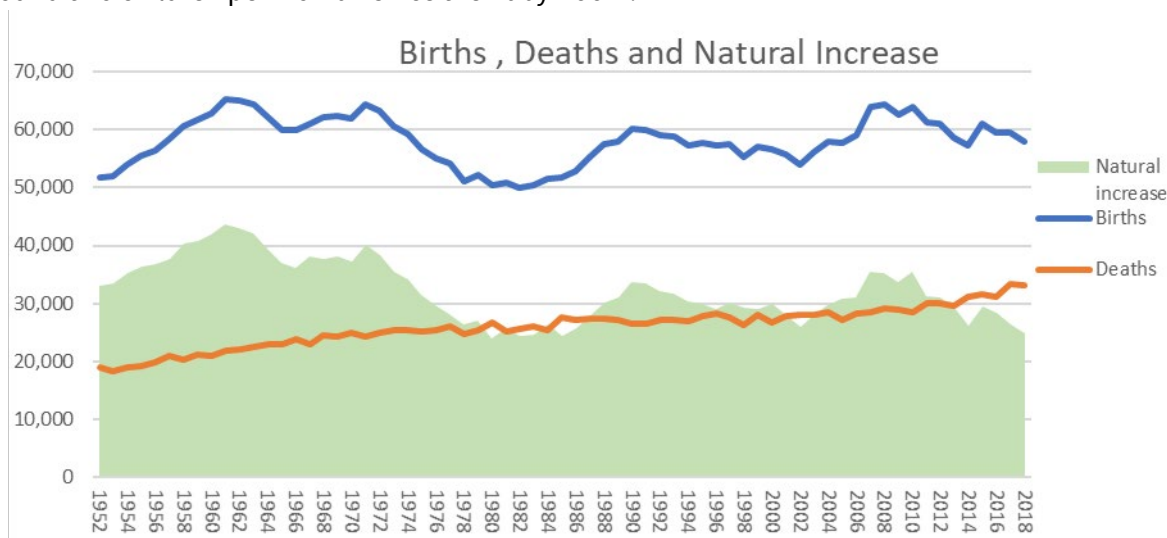
Low rates of hiring and retention post-GFC are likely to have happened in other sectors as well as the core Public Service. They are another factor, alongside aging, that could contribute to workforce capacity constraints in the next ten years. This pattern suggests that in future, greater emphasis should be placed on maintaining sustainable hiring and support for graduates throughout the economic cycle.

Public services facing increasing demand, as rate of population increases

Demand for public services is often linked to population growth. Gemmell, Gill and Nguyen (2016) found support for the relationship between population growth and public spending in New Zealand.³

New Zealand's estimated resident population at 31 Sep 2019 was 4.9m. Between 2014 and 2019, population increased by 400,000 the largest ever growth for a five-year period. The 9% increase over that period is the highest percentage increase since the early 1970s (confirmed in email correspondence with Stats NZ on 18/11/2019).⁴

The chart below shows that this population growth was not driven by the 'natural increase' (that is, births less deaths). The natural increase is actually trending downwards in recent years, especially in relation to population size, as the number of deaths increase due to population aging while fertility rates have remained flat around two children per woman since the Baby Boom.

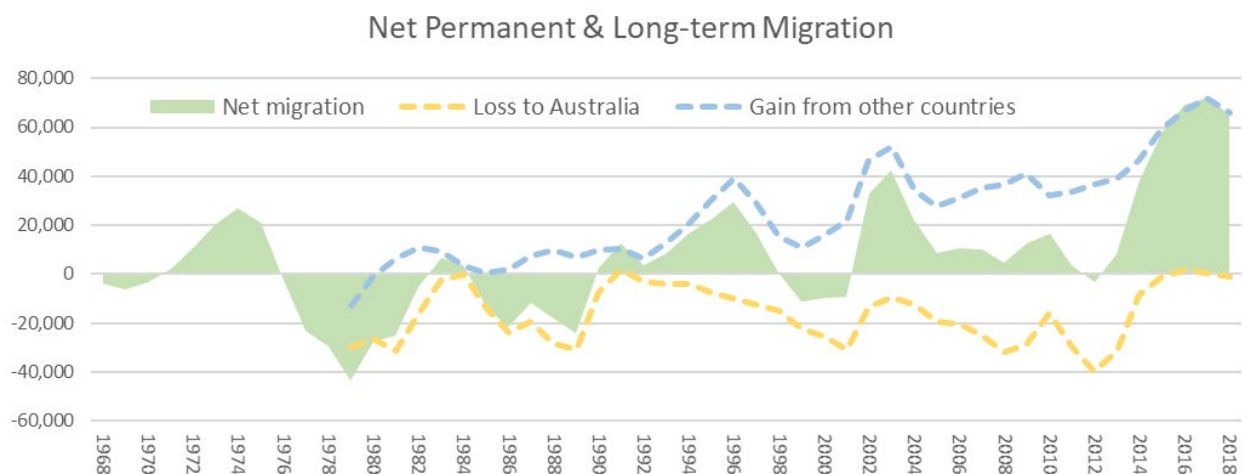


Source: Stats NZ Births and Deaths

The driver for strong recent population growth has been from net migration, which is at historically high levels, as shown in the following chart. Note below the substantial contribution to net migration over recent years from the declining loss to Australia. Our shared labour market with Australia means that a key driver of New Zealand population growth is the relative employment prospects between the two countries.

³ They also discuss other, non-demographic, drivers of the size of public spending.

⁴ This may underestimate population growth. Population estimates have yet to be revised to take account of Census 2018. Between the 2013 and 2018 Censuses, New Zealand's 'census usually resident population' increased by 460,000, the largest intercensal increase ever. The 11% increase over that period was the highest percentage increase since the 1961-66 period.



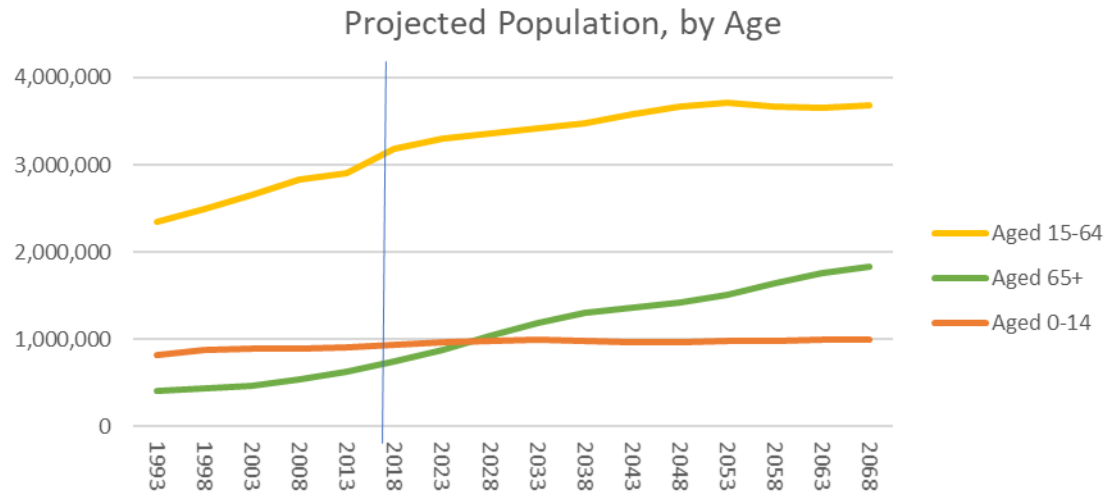
Source: Stats NZ Permanent & Long-term Migration

Future shifts are unlikely to help workforce pressures

The New Zealand population will continue to age

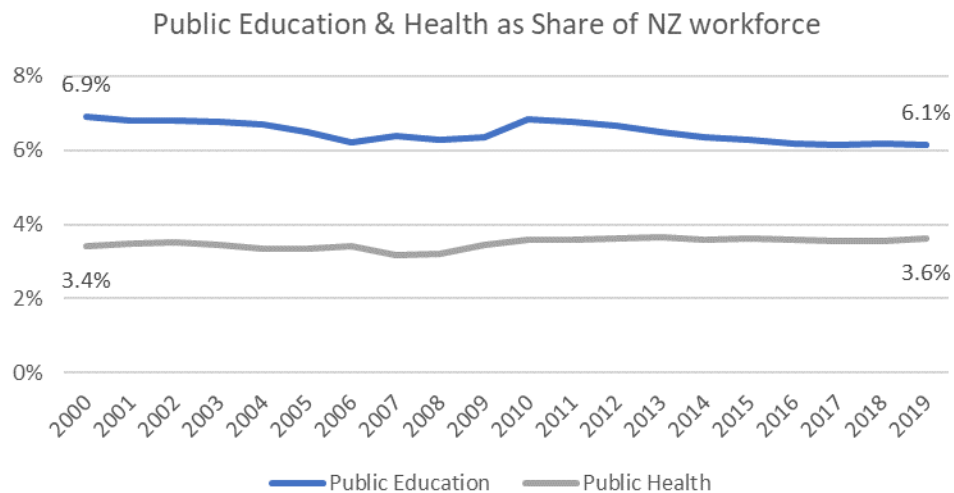
As we have seen the New Zealand population is aging, and this trend is projected to continue in for the next 50 years (see next chart). Those aged 65 and over are projected to increase at a faster rate than those aged 15 to 64 years.⁵ The numbers aged below 15 years are projected to grow at the slowest rate. All developed countries are aging to some extent due to the Baby Boom, although the extent of aging in New Zealand is not as strong due to our relatively high fertility rates.

⁵ The primary age range for the public service workforce will be 25 to 70 years, rather than 15 to 64 years. However, both age groupings show similar trends in the population projections.



Source: Stats NZ National population projections (2016 base)

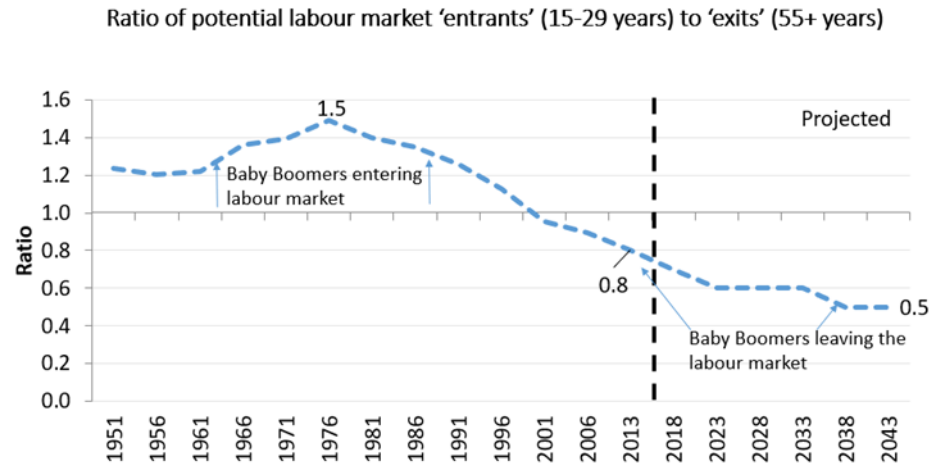
To some extent, the health and education workforces are impacted by the number of older people and children in the population, although other factors (for example, class sizes) also play a role. The size of the public health workforce, relative to the size of New Zealand workforce, has yet to be significantly impacted by the aging of the population (see next chart). However, there does seem to be a slight long-term decline in the public education workforce's share, as children become a smaller share of the population. Actual numbers of employees in the public education workforce increased from 110,370 in 2000 to 140,200 in 2019, but this increase was at an annual compound growth rate of 1.3%, compared to 1.9% a year for the entire workforce. The annual compound growth rate for the public health workforce was 2.1% over this period.



Source: Stats NZ Business Demography and SSC Workforce Data

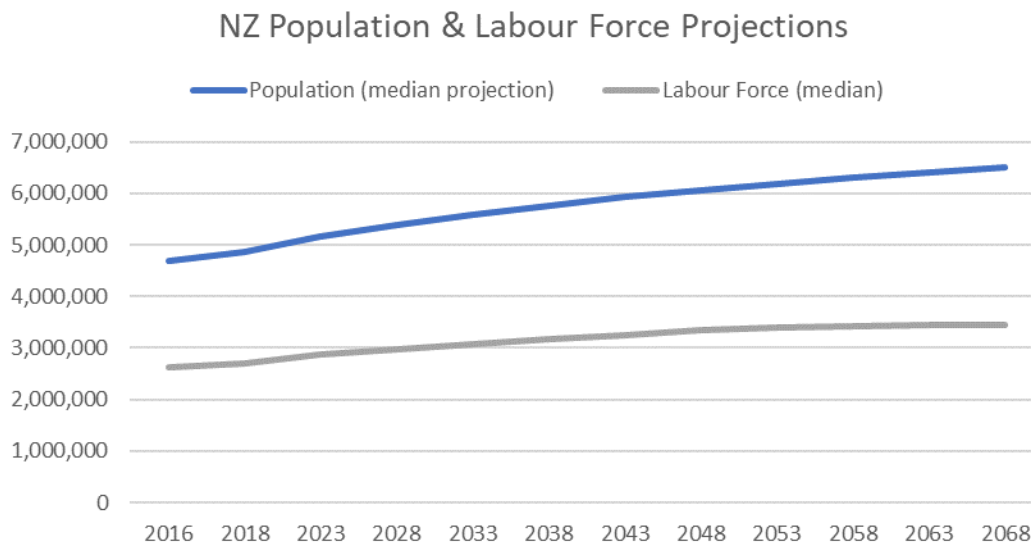
Population growth is projected to be higher than the growth in the labour force

A consequence of this long-term aging trend is that more people are projected to leave the labour market than enter it, as seen in the chart below.



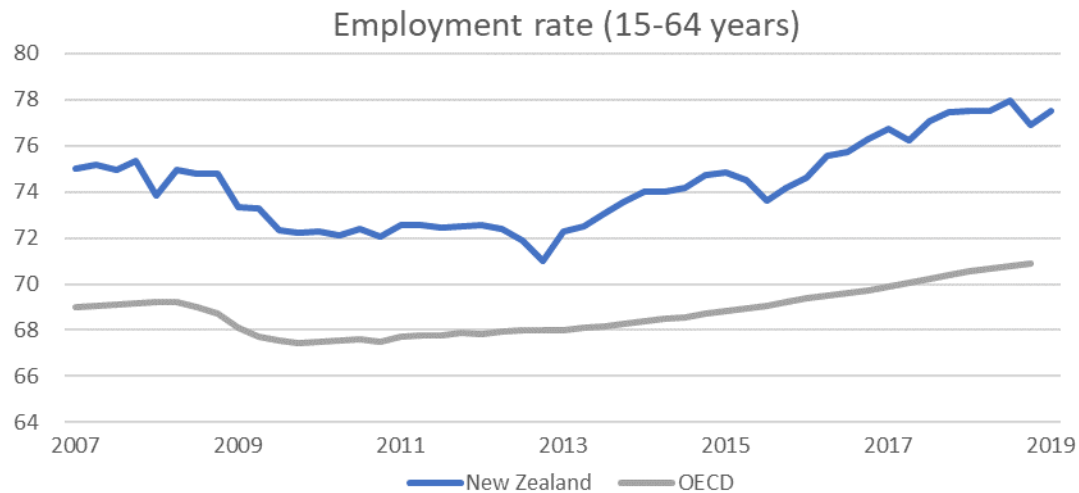
Source: Stats NZ various years; Population projections, 2013(base); Natalie Jackson Demographics Ltd.

This means that the size of New Zealand's population is projected to outgrow the available labour force. This will make it harder to meet workforce needs for a sector like public services where demand is often linked to population growth.



Source: Stats NZ National population projections (2016 base)

In addition, New Zealand participation rates in the labour market are already high by international standards, so there doesn't seem much scope to increase participation from New Zealanders aged 15 to 64 years (see following chart) who are not already working.

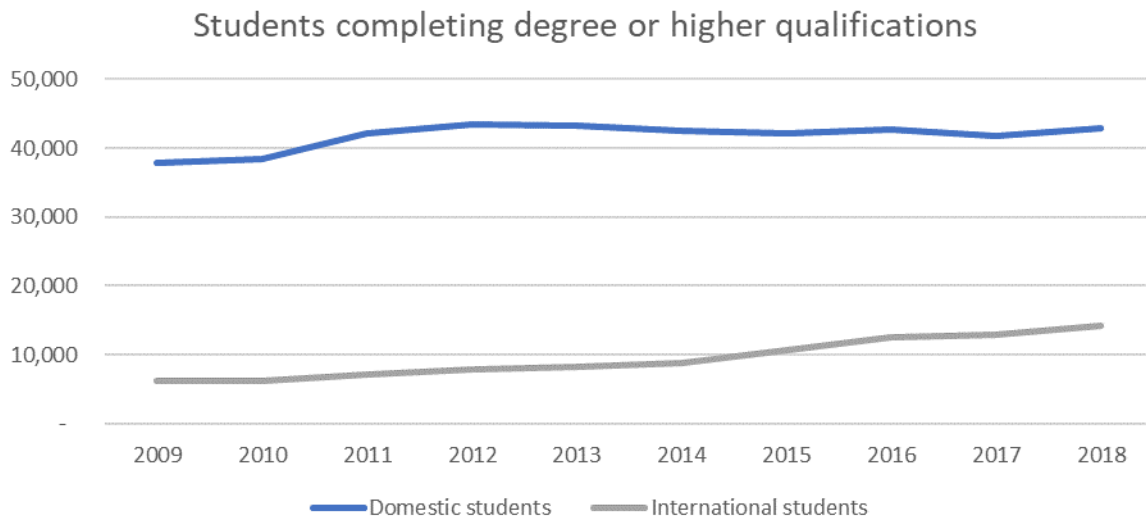


Source: OECD, Labour Force Statistics database; Stats NZ, Household Labour Force Survey.

There may be scope to increase participation from those New Zealanders who are working part-time, say through the improved provision of childcare and the accommodation of the needs of employees with disabilities. To some extent, this may already have happened, as the percentage of core Public Service staff who are in part-time work has been trending downwards over the past decade (from 7.9% in 2009 to 4.6% in 2019) (SSC, 2019). Figures from Stats NZ's Household Labour Force Survey shows there is also a downward trend in the wider labour market (from 22.5% in 2009 to 20.4% in 2019).

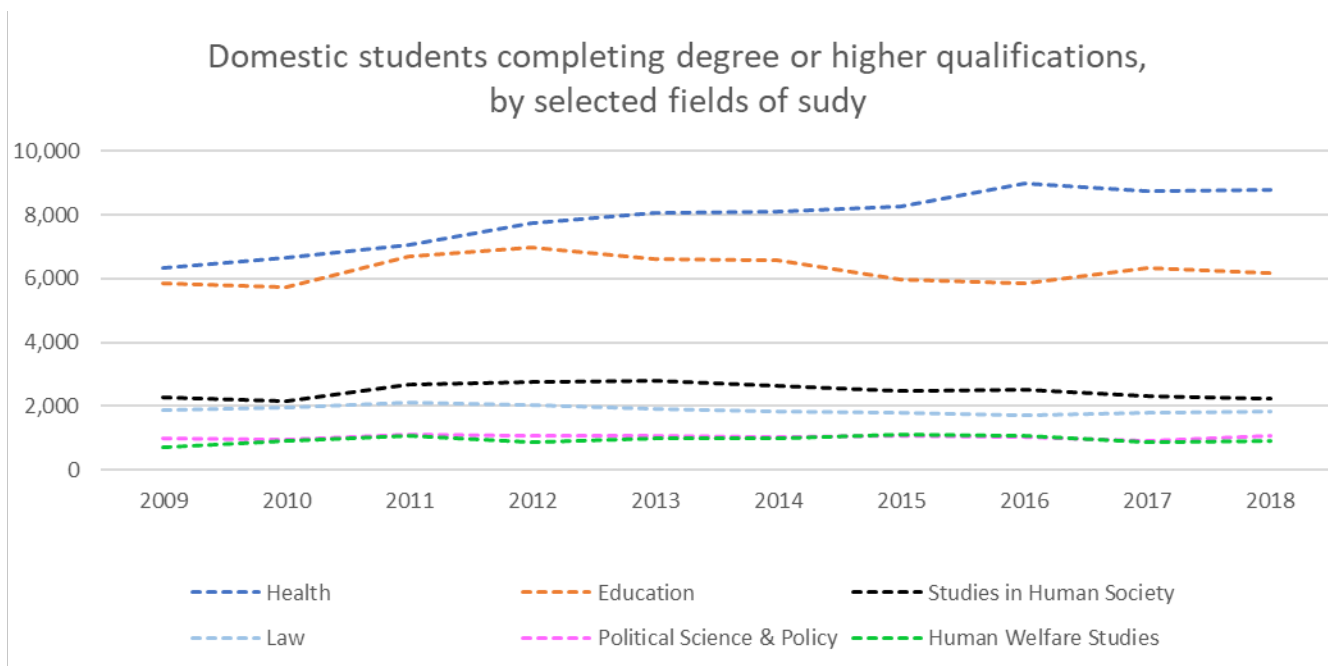
Growth in the university pipeline will not be sufficient

That there has been moderate growth in the number of young New Zealanders can be seen in the slow growth in the number of domestic graduates. This means growth in the university pipeline will not be strong enough to meet increasing demand from central government, unless increasing use is made of international students. In addition, as we will discuss later, technological change is expected to increase the demand for high skills from other sectors.



Source: Ministry of Education, Education Counts

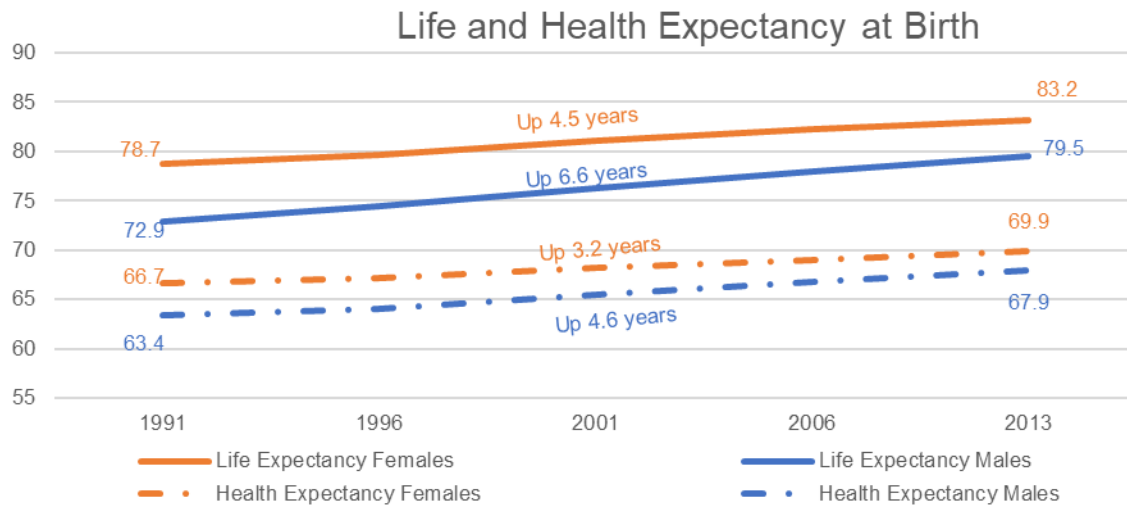
Other than health fields, there has also been little growth over the past decade in graduates in fields of study relevant to public services (see next chart).



Source: Ministry of Education, Education Counts

People can work for longer

People are healthier and able to work for longer. This can be seen in the estimates of health expectancy for New Zealanders.⁶ Therefore, central government can look to meet some of its future workforce demand by retaining more of its older workers, for longer.



Source: IMHE (2016)

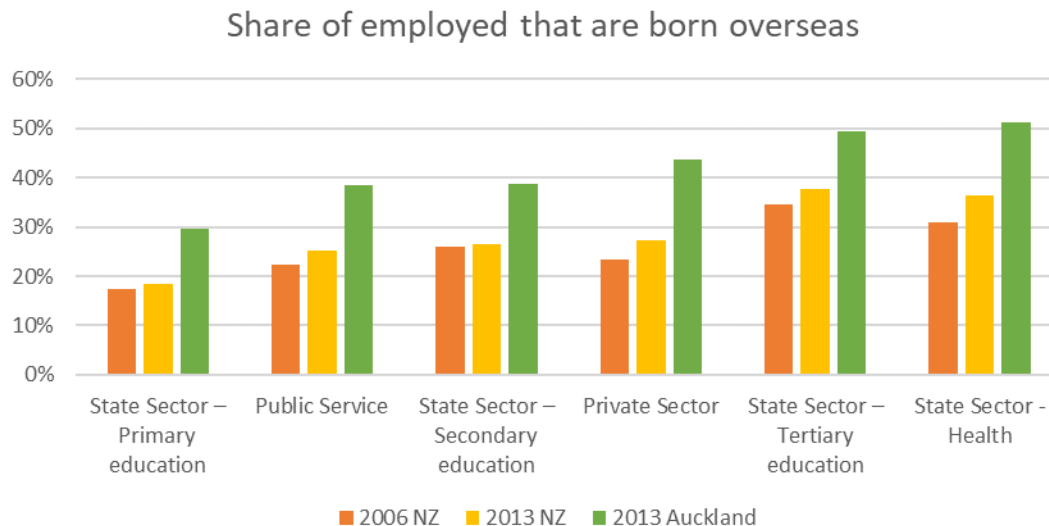
However, health expectancy is not increasing at the same rate as life expectancy (this is one reason that population growth is projected to outgrow the labour force). This points to increasing numbers of employees with disabilities in the future. Information from Statistics New Zealand's 2013 Disability Survey estimated the rate of disability in the core Public Service to be 16%, lower than that for the overall workforce (19%), although the difference was not statistically significant. 2019 data from the Household Labour Force Survey (Statistics NZ) shows that disabled people are underutilized in the workforce with an underutilization⁷ rate of 19.3% compared to 10.6% for non-disabled people.

Migration has increasingly been meeting workforce demands

Central government, like the private sector, have increasingly been making use of immigrants to meet workforce demand. This is shown by the increase in the percentage of the workforce that is born overseas. This is particularly true in the tertiary education and health sectors, and in the Auckland region

⁶ Health Adjusted Life Expectancy (HALE) is a measure of population health that considers mortality and morbidity. It adjusts overall life expectancy by the amount of time lived in less than perfect health.

⁷ People are considered to be underutilised if they are unemployed, underemployed (part-time workers who would like to work more hours) or are part of the potential labour force. The potential labour force includes people who are not actively seeking work but are available to work, and those who are actively seeking work but are currently unavailable.



Source: Stats NZ Census Data supplied to SSC

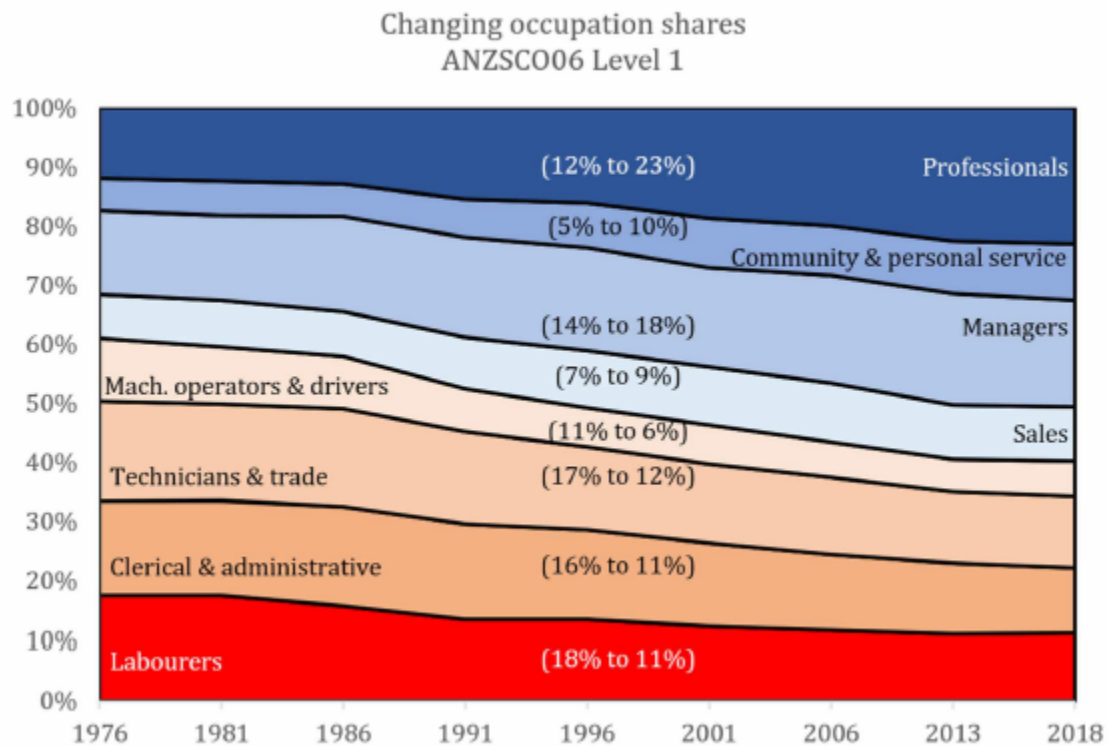
The population gains from migration have increased substantially since 2013. Has New Zealand reached a new high growth from migration plateau? If so, this would lessen concerns around future skills shortages. The Stats NZ projections used in this paper are based on lower gains from migration than has been achieved over the past decade.

However, high migration gains come with additional impacts on infrastructure and demands for public services, so it is not a panacea. In addition, the core Public Service may find it difficult to compete for skilled migrant workers given the growing global and New Zealand demand - the chart above shows that it does not use migrants as much as other sectors. There are also issues around meeting regional demand for public services outside of the main centres, where it may be harder to attract migrant employees.

Increasing demand for high-skill employees

As shown earlier, public services typically demand higher skilled employees than other sectors. If technological change is increasing the demand for higher skilled employees, this may increase competition for skilled employees across the labour market in the future.

The demand for skills in New Zealand has always shifted over time, driven by technological and other changes. The following chart shows how the demand for different broad occupational groups has changed in New Zealand since 1976. This shows that the three strongest growing occupational groups over this period (professionals, community & personal service workers, and managers) went from around 30% of all employed New Zealanders in 1976 to around 51% in 2018. These are three of the key occupational groups in the public service. The other key group, clerical and administrative workers, saw their share fall over this period, likely due to increasing automation of clerical tasks.

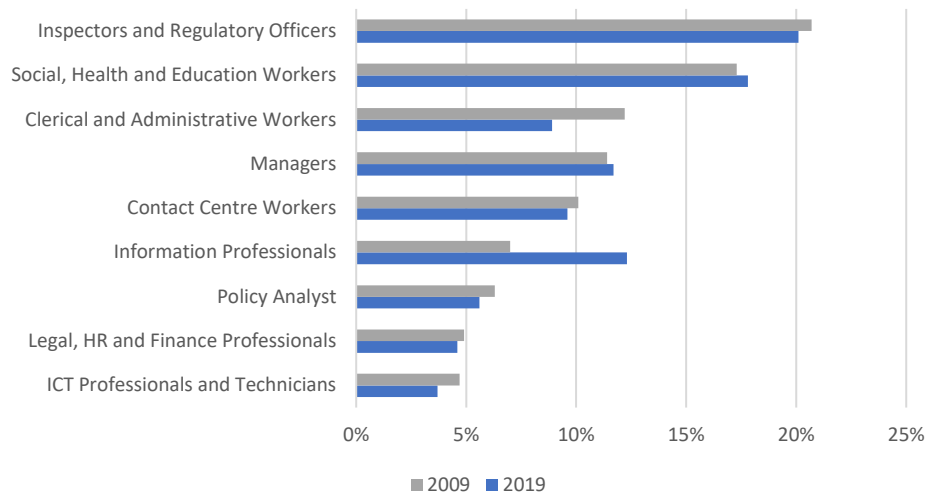


Source: Maré (2019).

This chart is from a study of long run occupational change in New Zealand (Maré, 2019). It found that “occupational change in New Zealand is broadly similar to that in the US or Australia, and that all three countries experienced a slowing in the rate of occupational change over recent decades.”

Similar trends can be seen in the core Public Service, over the past decade (see the following chart). The largest changes over this period has been the decline in the share of the Clerical and Administrative occupational group (from 12.2% of all core Public Service full-time equivalent employees in 2009 to 8.9% in 2019) and the rise in the share of Information Professionals (from 7.0% to 12.3% over the same period). Information professionals include roles such as data, business and intelligence analysts, and this increase is likely to relate to the increasing provision of digital services.

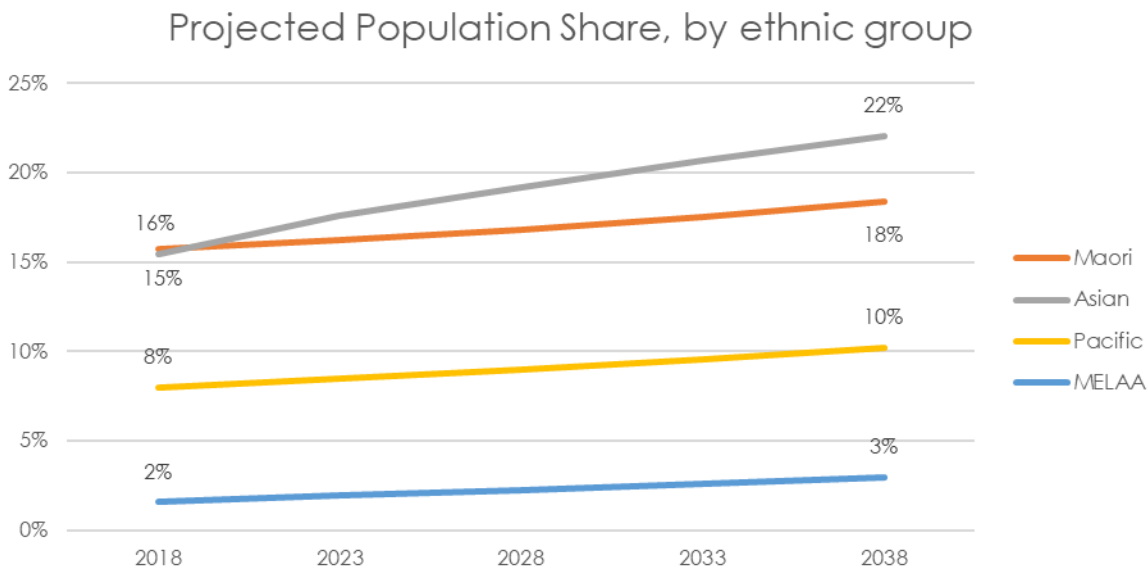
Changing Occupation Shares, Core Public Service



Source: SSC Workforce Data

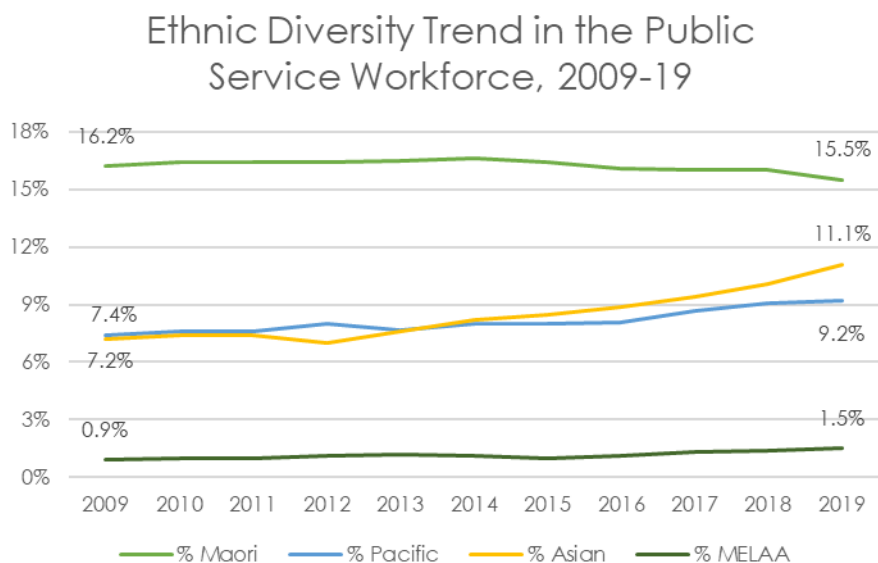
Increased ethnic diversity projected to continue

Stats NZ projects that New Zealand's population will continue to diversify in terms of ethnicity, as shown in the following chart. Contributing to this is the increasing proportions of New Zealanders with multiple ethnicities. The largest increase is projected in the Asian group, largely driven by Immigration (Stats NZ, 2017). The result of this is that younger New Zealanders will continue to be more diverse than earlier cohorts.



Source: Stats NZ Ethnic Population Projections (2013 base)

This increasing ethnic diversity of the population means the public workforce also needs to diversify if it is to continue to reflect the citizens it serves. The core Public Service workforce has shown increasing diversity over the last decade, with the share of Asian, Pacific and Middle Eastern, Latin African and American (MELAA) employees increasing, while the European share has decreased (down from 71.4% in 2009 to 67.3% in 2019). The share of Māori employees also dropped slightly, due to share of other ethnicities increasing, although in absolute terms the number of Māori employees continued to increase. The increase in Asian and Pacific staff is particularly pronounced in Auckland where they comprised 23.0% and 21.8% of Auckland core Public Service employees in 2019.



Source: SSC Workforce Data

% of those who disclosed ethnicity	All of Public Service	Senior leadership (Tiers 1-3)	NZ labour force (HLFS Jun 19 year)	NZ population (Census 2018)
European	67.3%	82.8%	71.0%	70.2%
Māori	15.5%	11.6%	12.5%	16.5%
Pacific	9.2%	3.6%	6.2%	8.1%
Asian	11.1%	2.4%	15.2%	15.1%
MELAA	1.5%	0.7%	1.2%	1.5%

Source: SSC Workforce Data

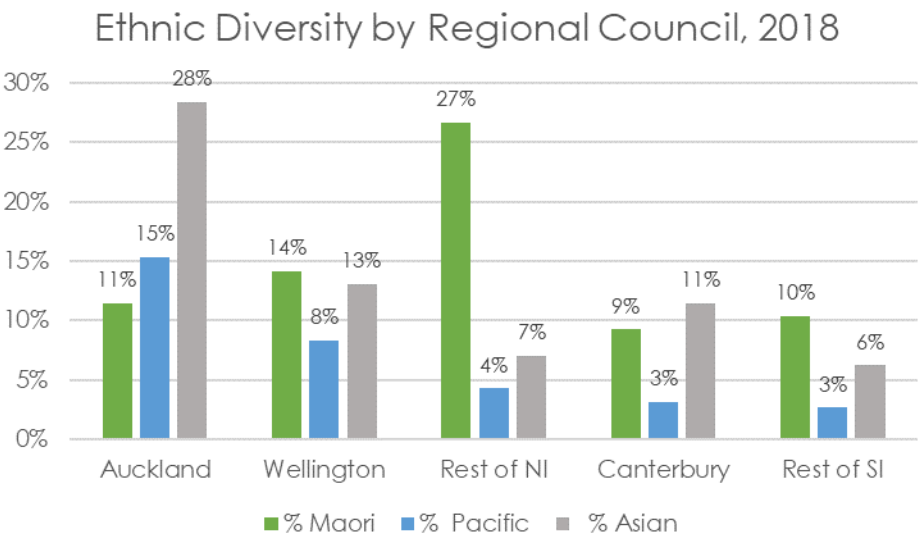
The table above shows that the workforce now broadly reflects the ethnic diversity of the New Zealand labour force and population for Māori, Pacific and MELAA employees, although it still lags in terms of the Asian ethnic group. However, there is still ethnic under-representation in senior leadership roles in the core Public Service. This will take time and deliberate effort to increase as non-European ethnicities are also under-represented at lower levels of management.

There are also ethnic differences in terms of core Public Service occupations. European staff are over-represented as Managers and Policy Analysts. Māori and Pacific staff are well represented as Inspectors and Regulatory Officers, and as Social, Health and Education Workers but less so in other professions. Pacific and Asian staff are highly represented as Contact Centre Workers and Asian staff as ICT Professionals and Technicians.

These ethnic differences in terms of seniority and occupation contribute to ethnic pay gaps in the core Public Service, as well as in the wider labour market. In 2019, the pay gap for Māori employees in the core Public Service was 10%, for Asian employees it was 12.5% and for Pacific employees it was 20%. These pay gaps may make the public services brand less appealing to potential employees (there are likely to be ethnic pay gaps in other sectors, but there is more transparency in the public service).

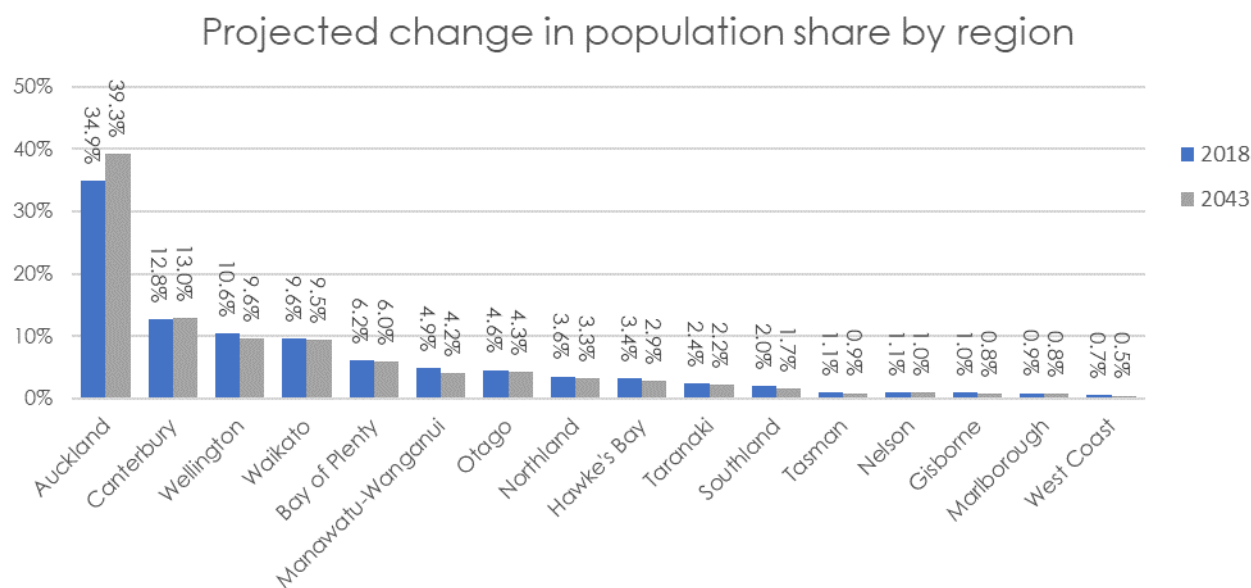
Diversity and population growth will be unequally shared across regions.

New Zealand’s ethnic diversity already varies considerably by region. Auckland has the highest proportion of Asian and Pacific people. The North Island, outside Auckland and Wellington, has the highest proportion of Māori.



Source: Stats NZ Census (2018)

Auckland is projected to continue to dominate population growth in the coming decades, and this will drive the growth in ethnic diversity. This will put pressure on public services to meet the demands of Auckland population and diversity growth. This pressure may be increased by high housing prices in Auckland, which are creating barriers to job mobility (New Zealand Productivity Commission, 2020), and may make it harder to recruit and retain Auckland-based public employees.



Source: Stats NZ Subnational Population Projections (2013 base)

To some extent, some of the pressure of meeting rising demand from Auckland, while also maintaining critical services in slower growth regions, could be alleviated by the growth of digital services that allow the remote provision of services. This growth in digital services has contributed to an increasing share of the core Public Service workforce, from 41.1% in 2015 to 43.8% in 2019, being Wellington-based. That period saw an increase in the number of information professionals in Wellington, particularly analysts in digital-related areas such as insights, client services and identity resolution (SSC, 2019).

Implications

Next 10 years

In the short-term, public services may face capability pressures as the baby boom generation retires, and the impact of the relatively low numbers of employees in the 35-44-year age range becomes more apparent.

These pressures are unlikely to be relieved by the tertiary education pipeline or by raising already-high labour force participation rates any higher. Instead there will likely be a continued need to rely on immigration to meet workforce needs. There is also scope to improve the retention of older public employees, through increased flexibility and retraining, and workplaces that better accommodate the needs of employees with disabilities.

Longer-term

In the longer-term, the solution to workforce pressures is likely to need a combination of:

- Targeted use of immigration for key skill shortages.
- Improving the public service employment brand to attract university graduates and diverse younger New Zealanders.

- A focus on retaining graduates possibly using alumni systems to bring back those who leave public employment
- Making productivity gains from new technology, new service models or workforce innovation.

These potential solutions will be difficult to get right in practice and will require well designed interventions by public organisations.

Improving information on the public service workforce:

In undertaking this work, some potential improvements to information on the public service workforce were identified. These improvements have cost and other factors to consider (such as privacy), but they are listed here as potential future lines of inquiry:

- Creating an IDI link database of core Public Service employees, by integrating payroll data, that allows a longitudinal view of graduate retention, career pathways and capability development.
- Building a centralised information collection system behind the jobs.govt.nz portal. This system could be used to improve understanding of:
 - Where skill shortages are, by monitoring hard to fill vacancies. MBIE does similar monitoring for the overall labour market with its Jobs Online reporting.
 - How recruitment processes are affecting diversity. This can be done by collecting and reporting aggregated information on the diversity of applicants and appointments. Similar data has been used to analyse diversity issues in the United Kingdom police forces (The Guardian, 2016).
- Running a core Public Service workforce census to fill the information gaps that administrative payroll and vacancy data cannot provide, such as on information on capability, learning and development, inclusive workplaces and flexible work arrangements. Public Service censuses are run in Australia and the United Kingdom.
- Modelling and forecasting to improve capacity and capability strategic planning.
- More integrated data on the whole-of-central government, including better information on the funded-workforce.
- Agree on key high-level indicators to monitor the state of the public workforce.

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