

POPULATION DYNAMICS AND COMPOSITIONAL CHANGES IN NEW ZEALAND'S POPULATION

Arvind Zodgekar,[†] *Victoria University of Wellington*

Mansoor Khawaja, *Statistics New Zealand*

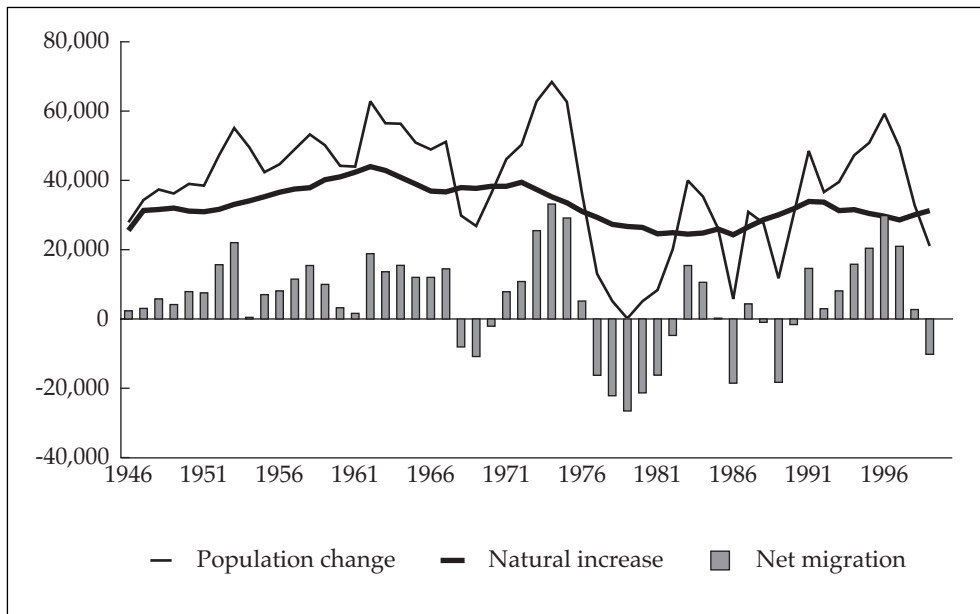
This paper discusses population dynamics and their effect on population composition in New Zealand. Trends in natural increase and net migration have contributed unevenly to the growth of the country's population. New Zealand in the future will have an ageing population and will become culturally more diverse. Other structural changes also are occurring, particularly among cohorts yet to pass through the core age groups for tertiary education. These changes have direct implications for economic and social planning for the future.

Over the last century New Zealand has experienced significant demographic change. Demographic growth and changes in population composition have been a result of both historical and more contemporary trends in fertility, mortality and migration. These trends have been interrelated, and in turn are causally linked with transformations in population structures (age, labour force, household, ethnic, etc.). This paper begins with some discussion of population dynamics, then traces their effect on population structure.

Population growth

In contrast to many Western countries, New Zealand's population is small. According to the latest official estimates it now stands at 3.84 million, compared with just 816,000 a hundred years ago. Despite population growth having been continuous, there have been considerable fluctuations in the population growth *rate* over the last hundred years. The post-Second World War years especially have witnessed significant variations in growth (Figure 1). Natural increase and net migration have contributed unevenly to overall population growth, the former having played a more consistent role. Its absolute contribution to population growth increased during the postwar Baby Boom (1946–61), but from the early 1960s until the mid-1980s this contribution declined gradually. There followed an upswing to the early 1990s that was caused by the so-called 'Baby Blip' New Zealand experienced during this period. Natural increase figures thus reflect the two important

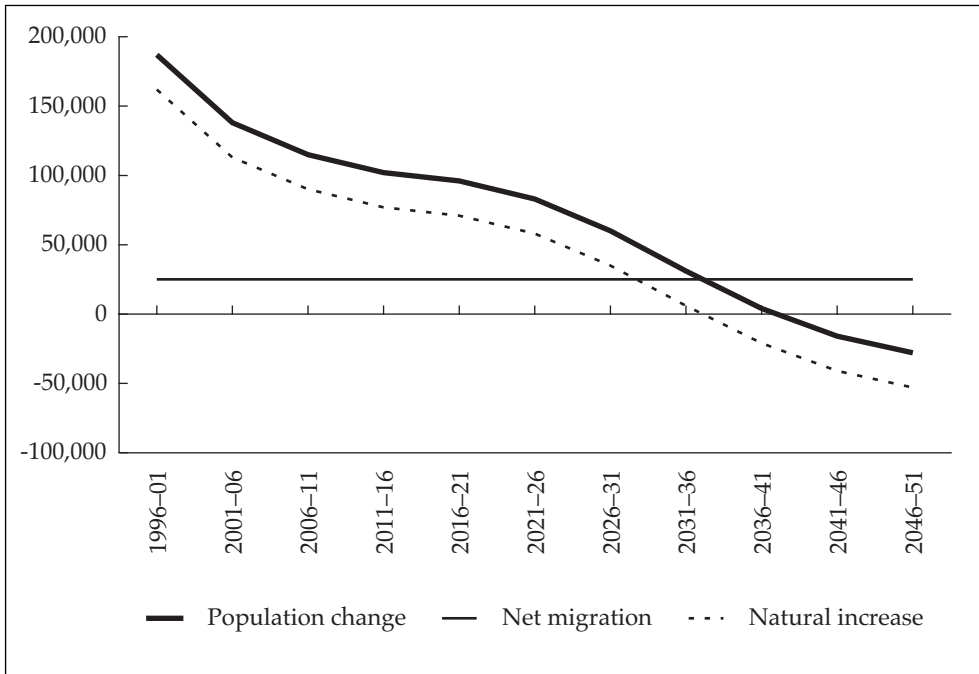
[†] Department of Sociology and Social Policy, School of Social and Cultural Studies, Victoria University of Wellington, PO Box 600, Wellington 6001, New Zealand. Email: arvind.zodgekar@vuw.ac.nz.

Figure 1 Components of population change, 1946–1999

Source: Statistics New Zealand, *Demographic Trends*, various years.

phases of fertility change experienced by New Zealand between 1946 and 1986: the 1946–61 Baby Boom, and the subsequent steep fertility decline. The impacts of international migration, while sometimes dramatic, have been more short-term. Up until the mid-1960s, international migration always contributed positively to population growth (Bedford *et al.* 1995; Lidgard and Bedford 1999). Since the late 1960s, however, there have been sharp shifts in the size and direction of the international migration balance. These changes have had a marked influence on the overall level and rate of population growth, and indeed have caused considerable disruption to the growth of New Zealand's population.

The population growth rate averaged 1.6 per cent per year during the twentieth century, but only 0.8 per cent per year between 1976 and 1996. All Statistics New Zealand projection series indicate a gradual slowing of the growth rate over the next 50 years. According to the medium projection series, which assumes a long-term total fertility rate of 1.90 births per woman and net immigration of 5,000 persons per year, it is expected to average 0.8 per cent a year in the early 2000s, 0.4 per cent a year in the late 2020s, and to become negative from the year 2040 (Figure 2). The slowing in the growth rate mainly reflects a narrowing gap between births and deaths. The annual number of births is expected to decrease from 57,000 in 1996 to 45,000 by the year 2051. The annual number of deaths will double over the same 55-year period, from 28,000 in 1996 to 56,000 in 2051. The number of deaths is expected to exceed the number of births by the mid-2030s. Consequently, natural increase (the excess of births over deaths) will contract steadily from 29,000 in 1996 to zero in 2035, and then reach -11,000 (a natural decrease) in 2051.

Figure 2 Projected components of population change, 1966–2051

Source: SNZ (1998c).

These past and projected changes in the dynamics of population growth will have a significant effect on population structure. There has been far less concern about future population composition than future growth in New Zealand, the major exception being ageing, which has captured political and media attention. Changes in population structure will be of increasing importance to development planning, social policy and the political economy in general. The importance of age and cohort effects, particularly to social policy, arises because at each lifecycle stage there are different social needs. In the past there has been a tendency to ignore population composition factors and to instead emphasize growth. Since the early 1990s, the world has begun to shift its focus from concern with the consequences of population growth to one with the consequences of changing population composition. Changes in composition will be an even more significant consideration in the twenty-first century, and New Zealand demographers have in recent years started to pay closer attention to their implications (Pool and Bedford 1996; Pool 1999).

Age composition and dependency

The number of New Zealanders aged 65 years and over is expected to increase significantly over the first half of the twenty-first century, from 0.43 million in 1996 to 1.15 million in 2051. By 2051, the elderly are expected to make up 25.5 per cent of all New Zealanders, compared with 11.7 per cent in 1996.

There will also be significant changes in age structure within the elderly group. Those aged 65–74 will more than double in number between 1996 and 2026, from 251,000 to 535,000, and will then decline to 479,000 by 2051. The number aged 75–84 years will almost treble during 1996–2026, from 140,000 to 418,000, before dropping slightly to 411,000 in 2051. Those aged 85+ years will increase more than sixfold, from 39,000 in 1996 to 255,000 in 2051, and their share of the elderly will increase from 9 per cent to 22 per cent. These changes reflect the combined effects of projected improvements in life expectancy and the movement of the large Baby Boom cohorts into older ages.

In 1961 the youth dependency ratio was 57 per 100 persons aged 15–64. Thirty-five years later, in 1996, it had dropped to 35, and it is projected to drop further to 27 by the year 2021 (Figure 3). After that the youth dependency ratio is projected to remain relatively stable. In contrast the elderly dependency ratio increased from 15 in 1961 to just 18 in 1996, but is projected to jump to 43 by 2051. It will be fairly stable between 1996 and 2011 owing to the passing into old age of smaller birth cohorts born during the 1930s. But from 2016 there will be a major increase in elderly dependency, and a steady decline in youth dependency. The crossover from higher youth to higher elderly dependency, and the internal ageing of the elderly population, will have significant consequences for the allocation of resources for care of the elderly (Zodgekar 1994).

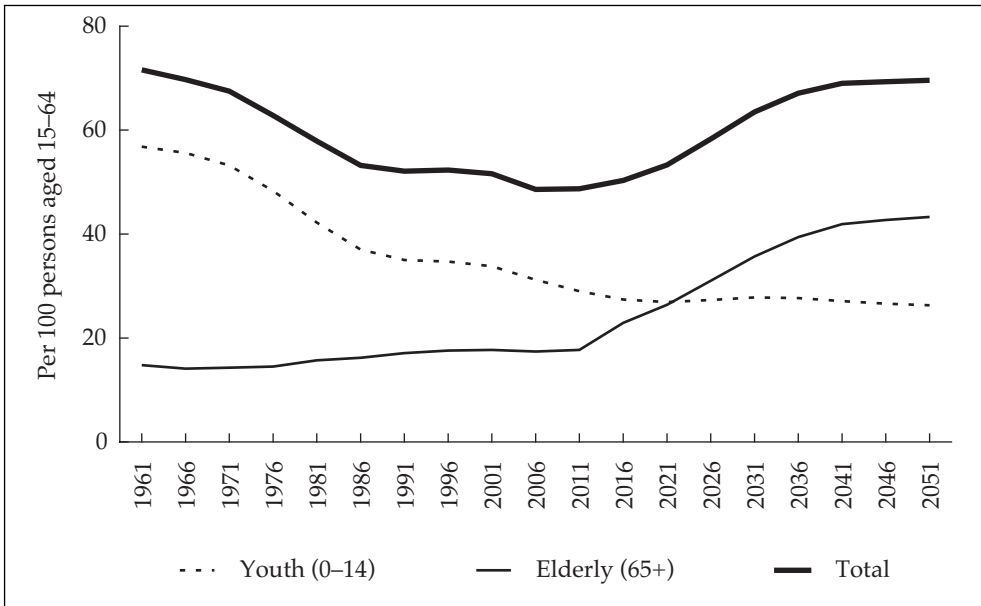
Cohort structural changes and tertiary education

Beyond the general ageing issues, other structural changes will occur, particularly among cohorts that will be passing through the core ages (15–39) for tertiary education. In 1998 nearly 86 per cent of tertiary students were under 40 years of age. The majority (65 per cent) were under 30 years of age. Since 1996, the percentage of the population aged 15–39 years has been declining, and this decline will steepen after 2026 (Figure 4).

This overall trend, however, conceals more varied compositional changes within the age group. New Zealand is going to experience wave-like changes in the component 15–24, 25–29 and 30–39-year age groups that will have short-term implications for tertiary education enrolments. Until 2003–04 the 15–24 and 25–29 age groups will decline, whereas the 30–39 age group will increase. These changes are likely to result in a decline, or at best a lack of increase, in tertiary enrolments. The following fifteen years should, however, see a reversal of this trend as a youth surplus develops in consequence of the rise in New Zealand's birth rate in the late 1980s and early 1990s.

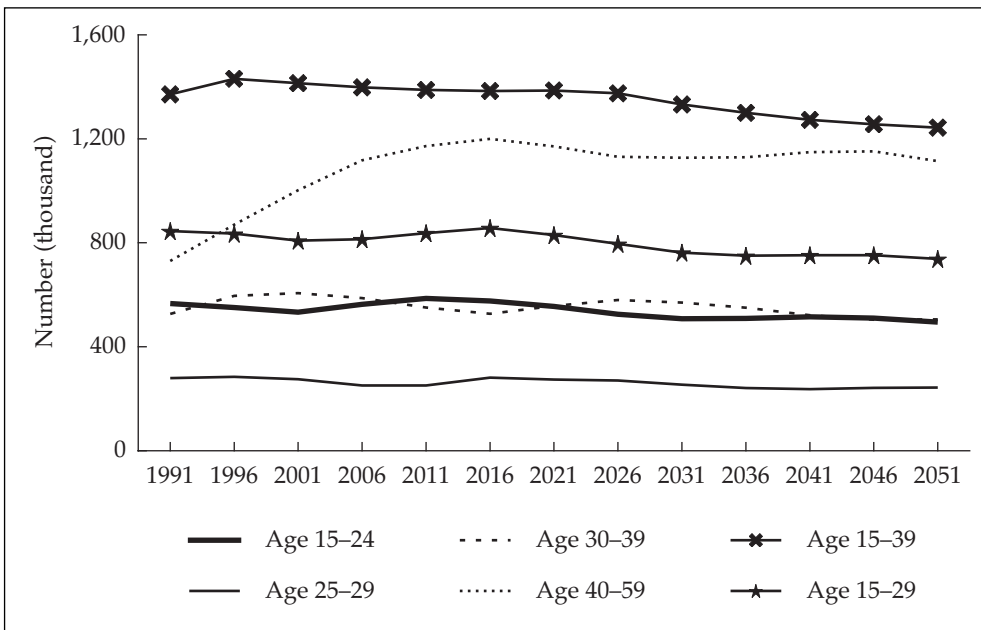
Historically, changes in tertiary participation rates together with population growth have been the major sources of increase in tertiary education enrolments. In the light of anticipated future changes in the sizes of core tertiary education age groups and the slowing down of population growth, it seems worth pointing out that future trends in 'mature age' educational participation and developments in lifelong learning could have significant ramifications for tertiary enrolments. So, too, could a move by younger people towards undertaking longer courses. In the final analysis, enrolments will reflect the impact not only of these demographic structural changes, but also of measures taken to provide greater access to tertiary education.

Figure 3 Dependency ratios, 1961–2051



Source: Derived from SNZ (1998c).

Figure 4 Projected population by age group, 1991–2051



Source: SNZ (1998c).

Population composition and the labour force

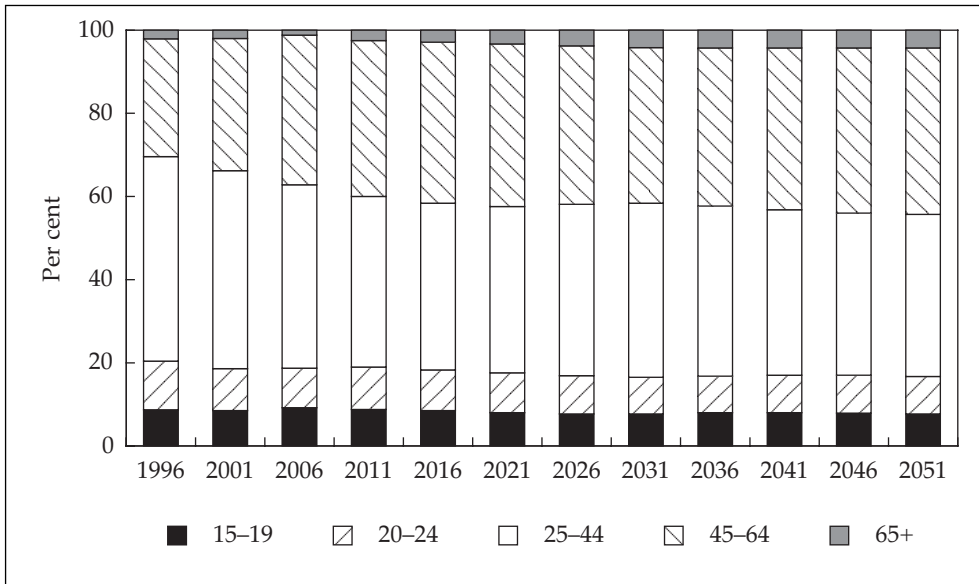
The projected changes in New Zealand's population size and age structure will have a significant effect on the growth and composition of the labour force. New Zealand's labour force is projected to grow, but at a decreasing rate, from 1.88 million in 1996 to 2.24 million by 2019. It will then drop, as the Baby Boom cohorts retire, to 2.11 million by 2051. The medium projection series shows the labour force growing at a rate that steadily declines from 1.5 per cent annually in the late 1990s to 0.01 per cent by 2019. The growth rate then becomes negative from 2020 onwards.

The changing demographic, social and economic environments are expected to result in rising labour force participation rates, particularly among those aged 55–69 years. Another important recent development in New Zealand has been the removal of the upper age limit for employment, which acknowledges the value of mature workers to national economic growth.

With the ageing of the population and anticipated changes in labour force participation, the age structure of the labour force will undergo significant change. The labour force will comprise fewer young people than in the past, a reality likely to trigger increased competition between the labour market and tertiary education institutions for their participation. By 2051, its young segment (15–24 years) will make up only 16.7 per cent of the total, compared with 20.4 per cent in 1996 (Figure 5). Similarly, there will be a decrease in the proportion in the middle working-age group (25–44 years), from 49 per cent in 1996 to 39 per cent in 2051. In contrast, older workers (aged 45–64 years) will increase their share of the labour force significantly from 28 per cent in 1996 to 40 per cent in 2051. The 'post-retirement' age group (65+) will also increase its share from 2 per cent in 1996 to 4 per cent in 2051. Because of these changes, half of the labour force will be older than 42 years by 2051, compared with a median age of 37 years in 1996. These structural changes in the labour force are bound to have a long-term impact on future labour market policies in New Zealand. The ageing of the population and the anticipated decline in the size of the labour force mean that the retention of skilled older workers will become an increasingly important objective of labour market policy. The stereotype that brands older workers as less employable, less motivated and less productive needs to be dispelled. This means developing policies and practices that make it possible for people to contribute to the national economy regardless of age.

Growing ethnic diversity

National demographic experiences generally aggregate a diversity of population trends, patterns and dynamics for population subgroups. This certainly applies to New Zealand, which is in the process of becoming a multiethnic society. There are marked ethnic differences in family size, childbearing norms, survivorship rates, migration levels, geographical distribution and age–sex structure (Khawaja, Boddington and Didham 1999). Ethnic inequities (between Māori and Pacific Island Polynesians on the one hand, and Pakeha and those of Asian origin on the other) in educational achievement, health standards, employment and housing are also well known, and provided the main impetus for the Labour government's policy aimed at closing social and economic gaps between major ethnic groups in New Zealand (see Te Puni Kōkiri 2000).

Figure 5 Projected age distribution of the labour force, 1996–2051

Source: SNZ (1998c).

There are, however, important statistical issues in identifying and classifying ethnic groups so as to be able to calculate reliable sociodemographic measures and chart groups' future demographic prospects (Pool 1991; Gould 2000). This particularly holds for multiethnic societies, where a growing proportion of children transcend the ethnic divide. Prior to 1986, a biological concept was used for determining a person's ethnicity in New Zealand for census and other statistical purposes. The 1986 and subsequent Censuses adopted the concept of self-identification, asking people about the ethnic group, or groups, they considered they belonged to and making provision for multiple ethnic identities (Khawaja *et al.* 1999). For demographic and related analyses, a person belonging to more than one ethnic group needs to be counted in each of the specified groups, because each group can claim him or her as a member.

The ethnic classifications used in deriving the ethnic population projections presented in Table 1 draw on this broader concept of self-identification. In each case, the base population includes people who identify with a given ethnic group either solely or with other ethnic groups, but excludes those persons who have, say, Māori, Pacific Island or Asian ancestry but do not identify with that ethnic group. The overall effect is that there is an overlap of ethnic populations, and the sum of all ethnic populations exceeds the total population.

Footnotes to Table 1 set out the main assumptions as to the future dynamics of population growth by ethnic group. The table itself shows projected change in the size, growth rate and age structure of each minority group, as well as of the predominantly European total population, over the next 50 years. The Asian ethnic group has only been projected to 2016, this shorter projection period reflecting the recent volatility of Asian migration levels, and uncertainty over future immigration

Table 1 New Zealand population projections by ethnic group, 1996–2051^a

Year ended June	Population					Percentage age distribution			Total fertility rate	Life expectancy at birth	
	('000)	Change ('000)	Growth rate (%)	% of total	Median age in years	0–14	15–64	65+		Male	Female
									Life expectancy at birth		
Māori ethnic group^b											
1996	548	–	–	14.7	21.6	36.9	60.1	3.0	2.55	67.8	72.6
2001	598	50	1.6	15.5	22.4	36.1	60.4	3.5	2.38	68.8	73.5
2011	686	88	1.2	16.6	24.7	31.5	63.8	4.7	2.14	70.8	75.4
2021	772	86	1.1	17.6	27.5	28.7	64.5	6.8	2.10	72.5	77.0
2031	855	83	0.9	18.7	29.7	27.9	62.3	9.8	2.10	73.8	78.3
2041	927	72	0.7	20.0	31.0	26.4	61.7	11.9	2.10	74.8	79.3
2051	993	66	0.7	21.5	31.7	25.8	61.2	13.0	2.10	75.5	80.0
Pacific Island ethnic group^c											
1996	213	–	–	5.7	20.7	38.5	58.6	2.9	3.05	69.5	75.7
2001	247	34	2.7	6.4	21.0	38.6	58.3	3.2	2.74	71.0	77.1
2011	307	60	2.0	7.4	22.9	33.5	62.3	4.2	2.27	72.9	78.9
2021	373	66	1.9	8.5	25.7	29.8	64.2	6.0	2.20	74.5	80.4
2031	447	74	1.7	9.8	27.7	29.8	62.0	8.2	2.20	75.8	81.5
2041	521	74	1.4	11.2	28.6	28.2	62.0	9.8	2.20	76.8	82.4
2051	599	78	1.4	12.9	29.5	27.2	61.9	11.0	2.20	77.5	83.0
Asian ethnic group^d											
1996	186	–	–	5.0	26.9	25.8	71.2	2.9	1.95	75.9	81.3
2001	249	63	3.5	6.4	28.2	25.1	71.6	3.3	1.91	76.8	82.1
2006	289	40	2.9	7.2	29.9	25.3	70.6	4.1	1.88	77.7	82.9
2011	330	41	2.4	8.0	31.8	25.3	69.6	5.1	1.86	78.5	83.7
2016	370	40	2.1	8.7	33.6	23.6	69.1	7.3	1.85	79.2	84.3

Total New Zealand population ^e										
1996	3,714	-	-	33.0	22.8	65.6	11.6	1.95	74.3	79.5
2001	3,861	147	0.8	34.7	22.7	65.4	11.8	1.96	75.8	81.0
2011	4,138	277	0.6	38.1	19.6	66.7	13.7	1.90	78.2	83.2
2021	4,375	237	0.5	40.4	17.7	64.4	17.9	1.90	79.8	84.7
2031	4,565	190	0.3	42.2	17.4	60.0	22.6	1.90	80.9	85.6
2041	4,642	77	0.1	44.4	16.4	58.4	25.2	1.90	81.5	86.2
2051	4,630	-12	-0.1	45.4	15.9	58.6	25.5	1.90	82.0	86.5

- a The base populations for these projections are the estimated population resident in New Zealand at 30 June 1996 (Māori, Pacific and Asian ethnic groups) and 30 June 1999 (New Zealand population).
- b Māori ethnic group projections assume a long-term total fertility rate of 2.10 births per woman, a net migration gain of 500 people per year, and a net loss due to interethnic mobility (series 5).
- c Pacific Island ethnic group projections assume a long-term total fertility rate of 2.20 births per woman, net immigration of 1,000 people per year, and a net loss due to interethnic mobility (series 5).
- d Asian ethnic group projections assume a long-term total fertility rate of 1.85 births per woman, net immigration of 4,000 people per year, and a net loss due to interethnic mobility (series 5).
- e New Zealand population projections assume a long-term total fertility rate of 1.90 births per woman and net immigration of 5,000 people per year (series 4).

Source: SNZ (1998a).

policy. Besides the usual assumptions on fertility, mortality and migration, ethnic projections make special allowance for interethnic mobility, or category jumping; that is, for people who change their ethnic classification over time. Different levels of population loss due to interethnic mobility have been assumed for different ethnic groups. Moreover, projected births for each group consist of all children born to women belonging to that ethnic group, as well as those born to women not in the ethnic group but whose partner belongs to that group. The Māori and Pacific Island populations, which together account for one in five New Zealanders, have much higher growth rates than the majority European population. This is due partly to their higher fertility rates, but also to rapid miscegenation. The two groups also have more youthful age structures than their European counterpart, and consequently greater built-in momentum for further growth.

The population projections presented in Table 1 assume a marked convergence in ethnic fertility rates over the projection period. In 1996, the total fertility rates of Māori and Pacific Island women – 2.74 and 3.42 births per woman – were respectively 37 and 70 per cent higher than the national average of just under 2 births per woman. The projections assume a gradual transition to replacement-level fertility for the Māori population, and a transition to just above that level, 2.2 births per woman, for the Pacific Island group. Life expectancies for these two groups are expected to improve by 7–8 years by 2051.

Given these scenarios, the growth rates for all ethnic populations are projected to decline. Māori, Pacific Island and Asian population growth will nevertheless continue to outpace that of the European population, which has exhibited subreplacement fertility over the last two decades and is expected to continue to do so. Fewer births than deaths (resulting in a natural decrease of population) could become a reality for the European population within the next three decades. For the Māori population, the gap between births and deaths will narrow by only a fifth between 1996 and 2051, while for Pacific Island people, births will outnumber deaths by a greater margin 50 years hence.

Given these growth dynamics and increasing miscegenation, New Zealanders will become ethnically more diverse, with minority groups accounting for a growing share of the country's population. Between 1996 and 2051, the Māori population is projected to grow by 81 per cent to almost a million and the Pacific Island population by 181 per cent to almost 600,000. Māori will make up 21 per cent of all New Zealanders in 2051 compared with 15 per cent in 1996, while the Pacific Island population's share is expected to more than double from less than 6 per cent to nearly 13 per cent. Once again, the figures for individual ethnic groups are not mutually exclusive, and so should be interpreted with due caution.

All ethnic populations will age. This is reflected in significant declines in proportions of children, and parallel rises in proportions aged 65+ (Table 1). The latter trend will be especially pronounced for Māori and Pacific Island people, for whom there are particularly low initial figures. Older Māori, for example, made up only about 3 per cent of all Māori in 1996, and this is projected to jump to 13 per cent by 2051. Overall, however, as measured by median age, the Māori and Pacific Island populations, even fifty years on, will be at least 3 years younger than the current European population. Their median ages in 2051 will be 32 and 30 years, respectively, as against the current median age of 35 years for the European ethnic group.

Finally, changes in ethnic share will not be uniform across all ages. Ethnic

minorities will comprise much larger shares of the country's population at younger ages. For example, while Māori are projected to make up 21 per cent of the total New Zealand population by 2051, they will account for 28 per cent of all New Zealanders at the younger working ages (15–34 years). Thus, in the future, a growing proportion of new entrants to the labour force will belong to ethnic minorities, and this will have direct implications for labour market policy, requiring, for example, interventions aimed at improving the skills of young Māori and Pacific Islanders.

More households but older householders

Table 2 highlights the projected changes in New Zealand households during the next 50 years. These projections were derived by Statistics New Zealand from an earlier set of 1996-base population projections, and refer to New Zealand residents living in permanent private dwellings. They assume that during the projection period: (a) New Zealand women will have 1.85 children on average; (b) life expectancy at birth will improve by six years; (c) there will be an annual net migration gain of 5,000 people; and (d) the proportion of people at each age living in households will remain unchanged at the base (1996) level. Under this scenario, the number of households is projected to increase by about half a million, or 42 per cent, from 1.29 million in 1996 to a peak of 1.83 million by 2044. The growth rate will slow steadily from 1.4 per cent in 1998 to 1.2 per cent in 2010 and 0.3 per cent in 2031, and will become negative during 2045–51. By 2051, New Zealand households will average 2.5 persons, compared with 2.9 persons in 1996 and 3.6 persons in 1971. Changes in the age structure of householders (defined as the reference persons of households) will mirror changes in the general population described above. Householders aged 65+ years will make up a growing proportion of all householders, rising from 19 per cent in 1996 to 36 per cent in 2051. Within this group, the number aged 85+ is projected to surge sixfold to 113,000 in 2051, when they will make up 17 per cent of all older householders, compared with just 7 per cent in 1996. In contrast, householders aged under 45 years will make up just 31 per cent of all New Zealand householders in 2051, well down from 50 per cent in 1996. The rise and then fall in the share of householders aged 45–64 years reflects the movements into, and then out of, that age group by Baby Boomers.

By the end of the projection period, half of all New Zealand householders will be older than 57 years, compared with a median age of 45 years in 1996. Recently, Statistics New Zealand has investigated deriving family projections as an alternative to the conventional household projections. This would involve a significant change in methodology, but would broaden the range of information available to include data on the likely future composition of families and households. Such data would be invaluable for policy development and planning for service provision.

Conclusion

The demographic landscape of New Zealand is changing. New Zealand will eventually have an aged population and will also become a more culturally diverse society. It is experiencing increasing diversity in household composition, and this trend, too, is likely to continue in the future. A further dimension of growing diversity is

Table 2 New Zealand household projections, 1996-2051^a

Year ended June	Number of households	Change in householders ^b due to:			Growth rate (%)	Average persons per household	Median age of householders (years)	Percentage of householders aged (years)			
		Migration	Ageing of population	—				<45	45-64	65-84	85+
1996	1,285,000	—	—	—	2.9	45	50	30	18	1	
2001	1,375,000	2,300	13,800	1.2	2.8	46	48	33	18	2	
2011	1,527,000	2,000	13,400	1.0	2.7	49	41	38	19	2	
2021	1,677,000	2,000	12,100	0.8	2.6	52	37	37	24	2	
2031	1,786,000	2,000	5,900	0.4	2.5	55	35	33	29	3	
2041	1,830,000	2,000	-200	0.1	2.5	56	32	32	31	5	
2051	1,824,000	2,000	-4,100	-0.1	2.5	57	31	33	30	6	

a These projections relate to series 4M. This assumes that over the projection period New Zealand women will have 1.85 children on average, life expectancy will improve by six years, there will be an annual average gain from migration of 5,000 persons, and household rates will remain constant at 1996 levels.

b A household is the reference person of the household.
Source: SNZ (1998b).

wider open acknowledgement of ethnic differences. Expected changes in New Zealand's population structure will have direct implications for economic and social planning in the future. The time has now come to discuss in some detail appropriate policies for adjusting to these changes, for adjustment will be essential.

References

- Bedford, R.D., E. Ho, J. Lidgard, S. Kim and J. Young. 1995. *International Migration In New Zealand: Perspectives on Theory and Process*. Population Studies Centre Discussion Paper No. 7. Hamilton: University of Waikato.
- Gould, J.D. 2000. Counting Maori. *New Zealand Population Review* 26(2):1-19.
- Khawaja, M., W. Boddington and R. Didham. 1999. Growing ethnic diversity in New Zealand and its implications for measuring differentials in fertility and mortality. Paper presented at Population Association of New Zealand Conference, Wellington, July.
- Lidgard, J. and R.D. Bedford. 1999. New Zealand's international migration system at the end of the 20th century: review and prospect. *New Zealand Population Review* 25(1-2):41-56.
- Pool, I. 1991. *Tē Iwi Maori: A New Zealand Population Past, Present and Projected*. Auckland: Auckland University Press.
- Pool, I. and R. Bedford. 1996. *Macro Social Change in New Zealand: Historical and International Contexts*. Population Studies Centre Discussion Paper No. 18. Hamilton: University of Waikato.
- Pool, I. 1999. People (= population) and public policy in New Zealand. *New Zealand Population Review* 25(1-2):57-80.
- Statistics New Zealand (SNZ). 1998a. *Maori, Pacific Island and Asian Population Projections, 1996 (Base) – 2051*. Wellington.
- Statistics New Zealand (SNZ). 1998b. *New Zealand Household Projections, 1996 (Base) – 2051*. Wellington.
- Statistics New Zealand (SNZ). 1998c. *New Zealand Population and Labour Force Projections, 1999 (Base) – 2051*. Wellington.
- Te Puni Kōkiri. 2000. *Progress Towards Closing Social and Economic Gaps Between Maori and Non-Maori*. Wellington.
- Zodgear, A.V. 1994. The social impact of recent and prospective mortality decline among older New Zealanders. *Asia-Pacific Population Journal* 9(2):47-60.