Abstract

Ethnic fertility trends: convergence of diverse patterns in New Zealand?

New Zealand's birth rates – among the highest in the OECD over the last 70 years – have driven national and local population growth. However, New Zealand's period total fertility rates have dropped significantly over the last 15 years, while international migration has increased its contribution to population growth.

Period fertility measures are always susceptible to temporal social and economic factors, but the cohort measures are unequivocal: New Zealand couples are having fewer children with each successive generation. A wider array of fertility measures – including completed fertility and childlessness rates – all indicate sustained fertility declines across New Zealand's ethnic subpopulations.

Despite these trends, fertility patterns continue to be a key driver of changes in the ethnic make-up of New Zealand. It is not just differences in fertility rates, but the combination with differences in age structure and intermarriage that are important.

We look at whether ethnic fertility rates are converging, or whether fertility differentials are widening. This is of broad interest to observers of demographic transition theory. It is also a fundamental question for projection practitioners considering future fertility assumptions and how ethnic subpopulations will evolve over the coming decades.

Ethnic fertility trends: convergence of diverse patterns in New Zealand?

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The results presented in this study are the work of the author and do not necessarily represent the views of Statistics New Zealand.

New Zealand's birth rates – among the highest in the OECD over the last 70 years – have driven national and local population growth. However, the decline in New Zealand's period total fertility rate since 2010 is one of the largest among OECD countries (Saito, OECD, World Bank). Meanwhile international migration has increased its contribution to population growth.

In this paper we explore whether the fertility trends experienced in New Zealand are common across all the major ethnic group populations. We look at whether ethnic fertility rates are converging, or whether fertility differentials are widening. This is of broad interest to observers of demographic transition theory. It is also a fundamental question for projection practitioners considering future fertility assumptions and how ethnic subpopulations will evolve over the coming decades.

We conclude with some insights applicable to all countries.

Ethnic group background

In this paper we focus on four broad and overlapping ethnic populations in New Zealand:

- Māori, which comprised 911,000 or 18 percent of New Zealand's estimated resident population at 30 June 2023
- Pacific, 464,000 or 9 percent
- Asian, 974,000 or 19 percent
- European or Other (including New Zealander), 3,494,000 or 67 percent.

The remaining ethnic grouping at the highest level of the ethnicity classification (Stats NZ, nd) is 'Middle Eastern/Latin American/African' (MELAA), which comprised 104,000 or 2 percent of New Zealand's estimated resident population at 30 June 2023.

People can, and do, identify with more than one ethnic group, which means the sum of ethnic group estimates will be greater than the total New Zealand estimated resident population (5,200,000 at 30 June 2023). People who identify with more than one ethnicity are included in each ethnic group they identified with.

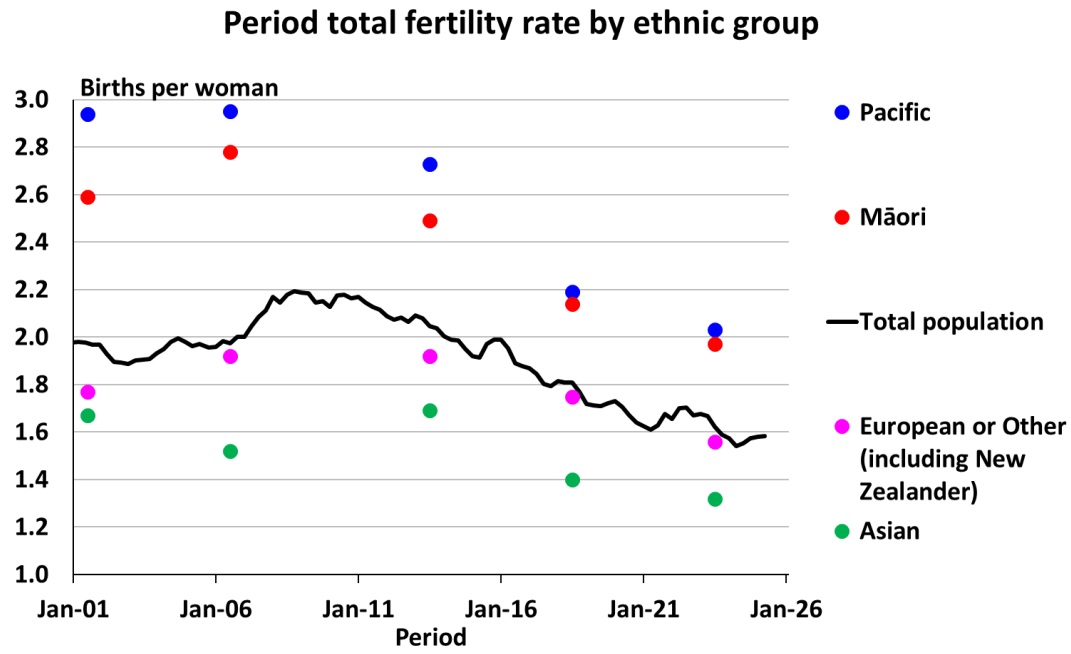
In a New Zealand context, ethnicity is the ethnic group or groups that people identify with or feel they belong to. Ethnicity is a measure of cultural affiliation, as opposed to

race, ancestry, nationality, or citizenship. Ethnicity is self-perceived and people can belong to more than one ethnic group.

Period TFR tells a partial story

At first glance, the trend in ethnic period total fertility rates (TFR) suggests an unremarkable story: a decline in the TFR across all major ethnic populations, at least since 2013, but with the ethnic ordering maintained (figure 1). With the exception of Māori, these ethnic TFRs are derived five-yearly aligned with the availability of the requisite population estimates. However, period fertility measures are susceptible to temporal factors (Bongaarts and Feeney), be those social, economic or environmental, which demand further analyses.

Figure 1



Note: Ethnic TFRs are based on three years of births data centred on the census year population estimate. The total population TFR is a rolling annual series over quarters.

Generational declines in average family size

Annual time series of cohort fertility requires coherent birth and population estimates at each age over the childbearing lifetime of females. This exists for total New Zealand females, but not for ethnic sub-populations, largely because of changes in ethnic concept and collections over time.

Fortunately, census data on 'children ever born' provides an alternative option for countries, or for sub-populations within a country. The New Zealand 'Census of Population and Dwellings' has asked this question in most censuses since 1981. We look at the results for females aged 45 to 54 years in each census, representing females who are close to completing their childbearing. We note that these are not closed

cohorts, but open to both migrant arrivals and migrant departures (and deaths) which add to and deplete the cohort populations, respectively.

Comparing the completed fertility experience of women of different ethnicities indicate that, at least for recent generations, the mean number of children is progressively less with each successive generation. This is true whether looking at females born in specific years by census (figure 2), or in a specific age group at each census (figure 3). It also applies to those females giving birth (figure 4), as well as for women overall.

Figure 2

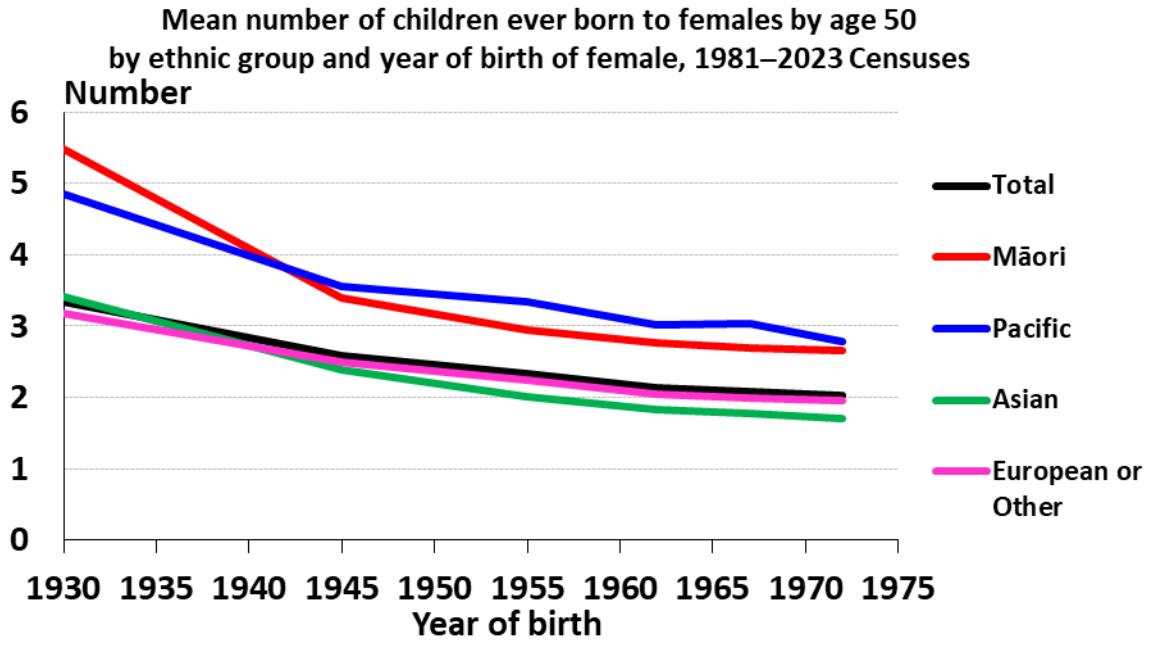


Figure 3

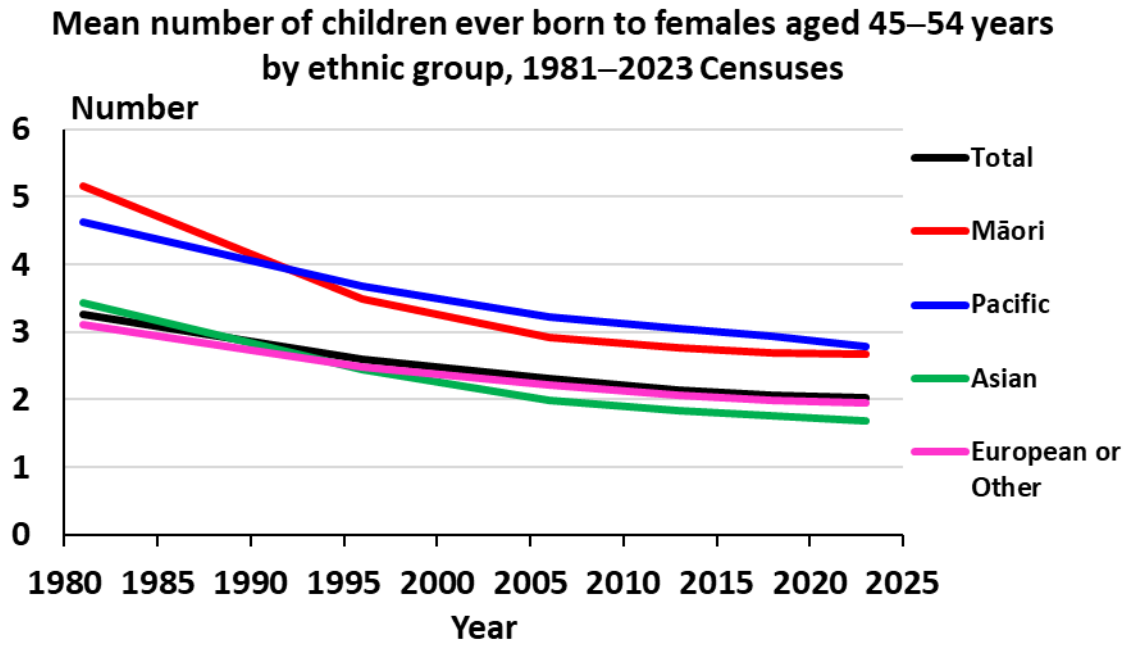
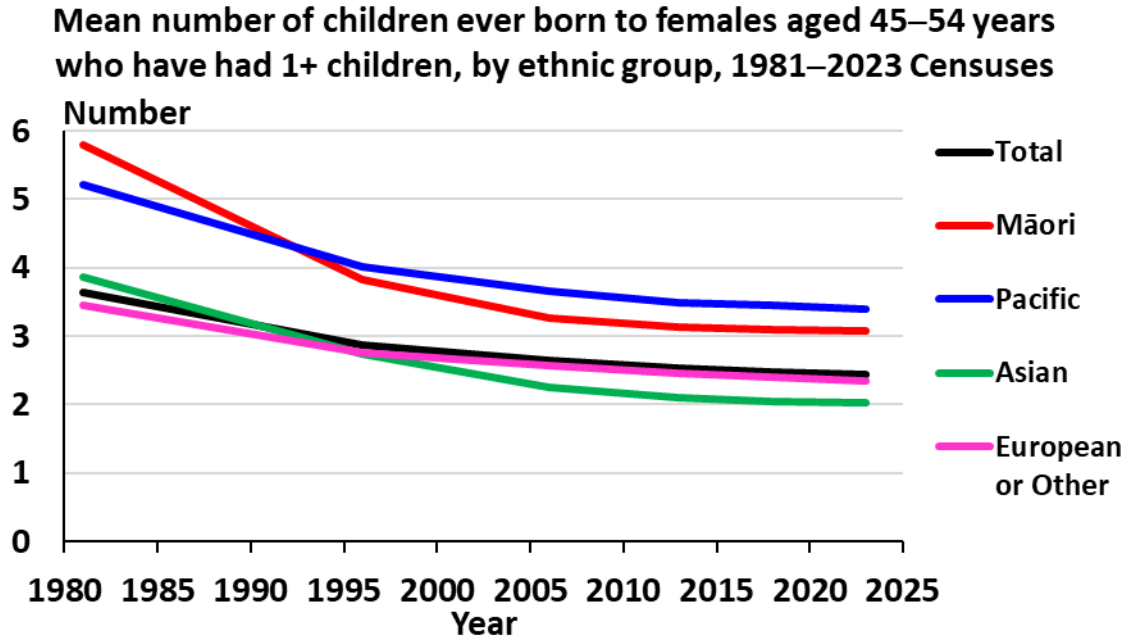
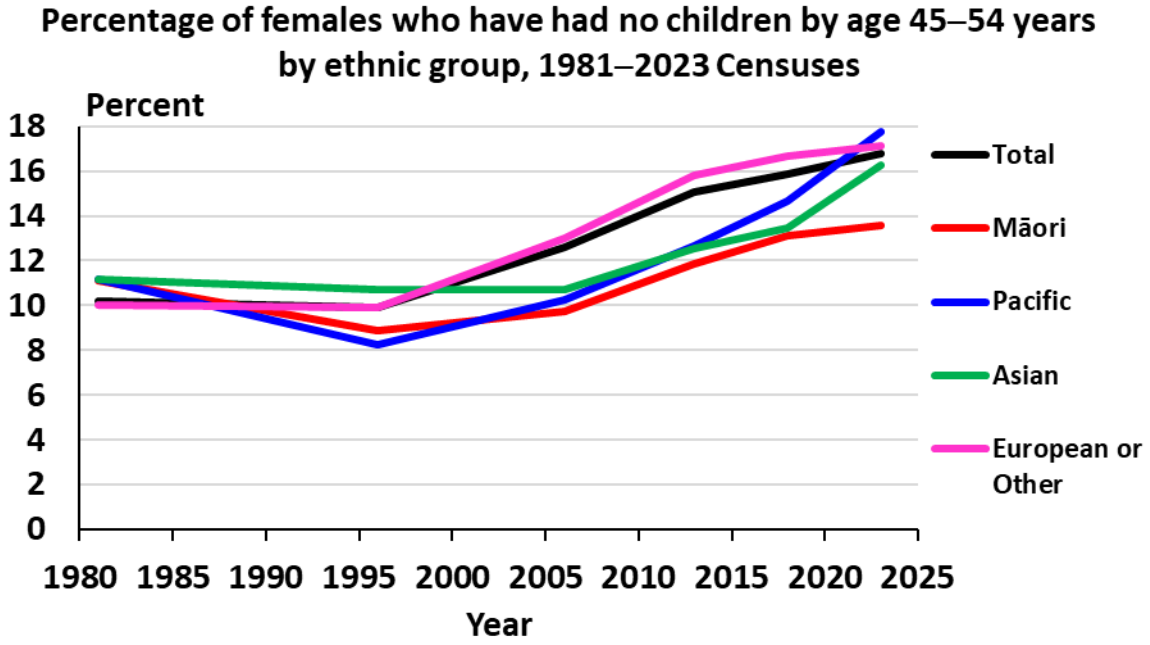


Figure 4



We also observe a progressive increase in the proportion of women having no children across all major ethnic groupings (figure 5).

Figure 5



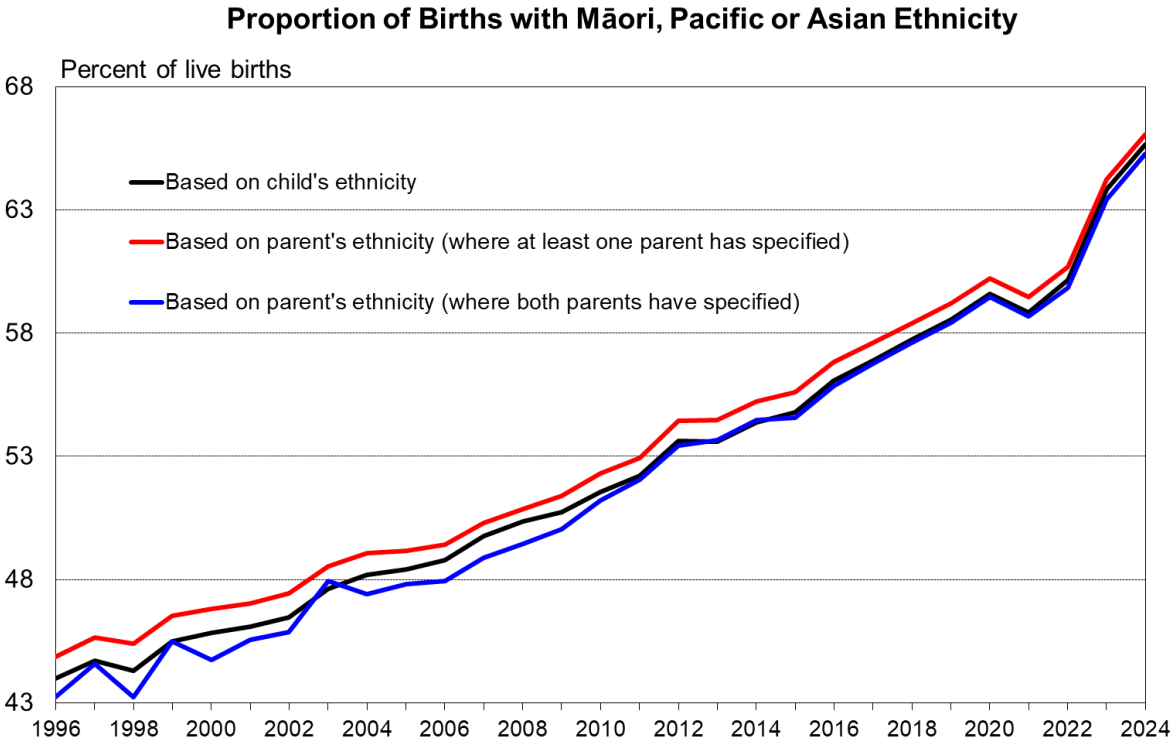
It remains unclear whether all the major ethnic populations are now at sub-replacement fertility. The cross-sectional period TFRs may be below replacement level, but for the latest birth cohorts to have completed their childbearing – those born in the early 1970s – Māori and Pacific completed fertility rates are still well above replacement

level (at 2.7 and 2.8 births per woman, respectively). Nonetheless, the cohort fertility data supports the hypothesis that fertility rates are indeed declining over all major ethnic group populations. More tentatively, the data supports some convergence, without necessarily implying the respective rates will fully converge. The range in the mean number of children ever born across the four ethnic groups was 2.05 in 1981, progressively reducing to 1.09 in 2023 (figure 3).

Fertility differentials contributing to ethnic population diversification

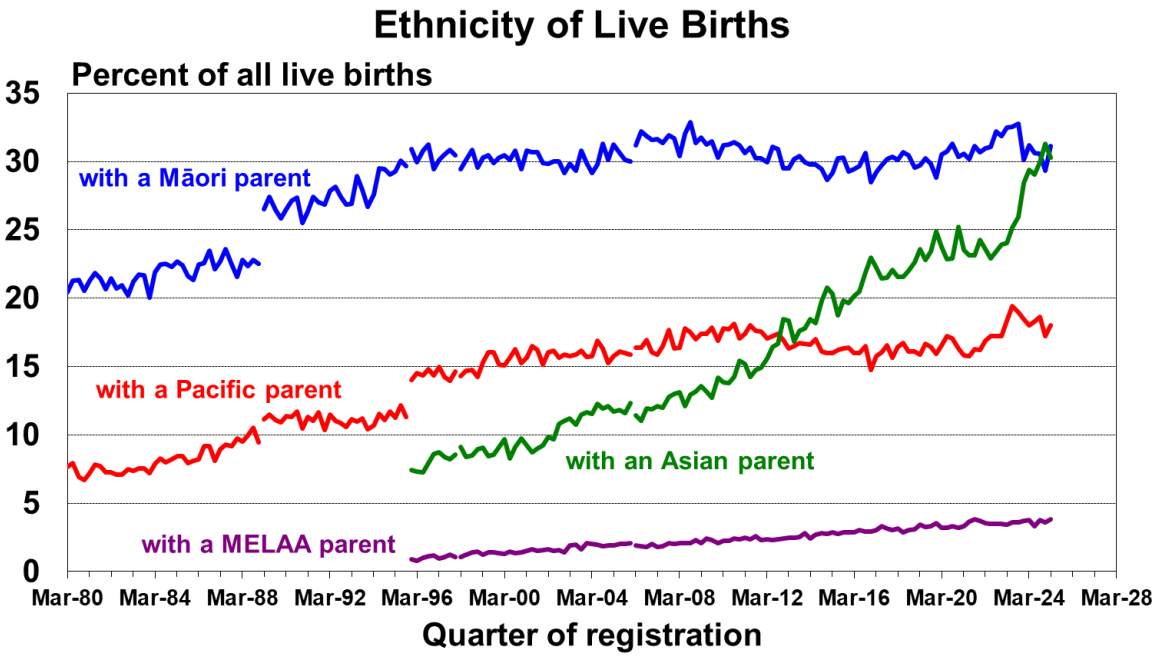
Much of the interest in ethnic fertility differentials stems from the implications these have for ethnic population change. Two in three births in New Zealand had a Māori, Pacific and/or Asian ethnicity in 2024, compared with two in five in the mid-1990s (figure 6).

Figure 6



Over the same period, 1996 to 2024, the proportion of births with a Māori or Pacific ethnicity has remained around 2 in 5. It is therefore the increase in births with an Asian ethnicity that has driven this overall increase (figure 7).

Figure 7

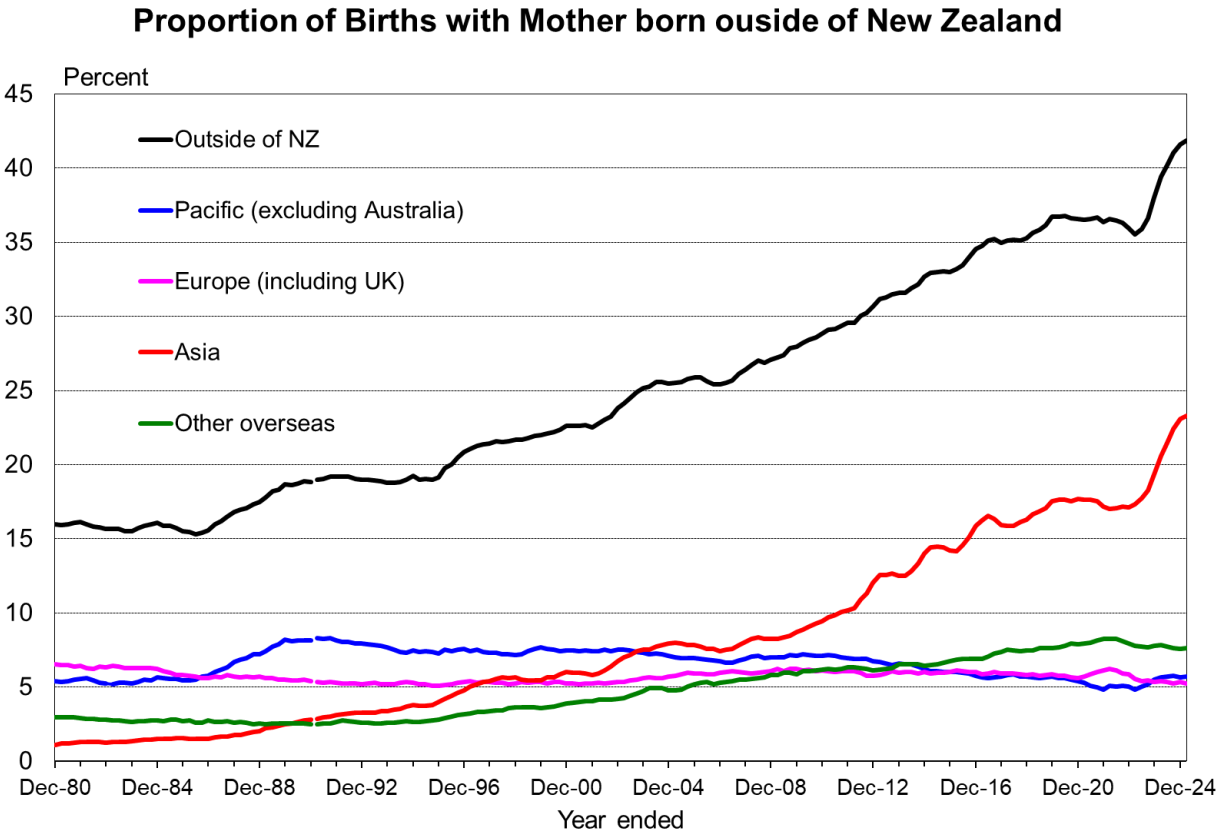


Note: Breaks in the time series indicate changes to data collection.

This increase in Asian births might appear counter-intuitive, given the Asian TFR has consistently been the lowest among the major ethnic groups. It is the combination with age structure, however, that is important. The Asian population has significant numbers in the childbearing ages – twenties, thirties and forties – driven by international migration since the 1990s.

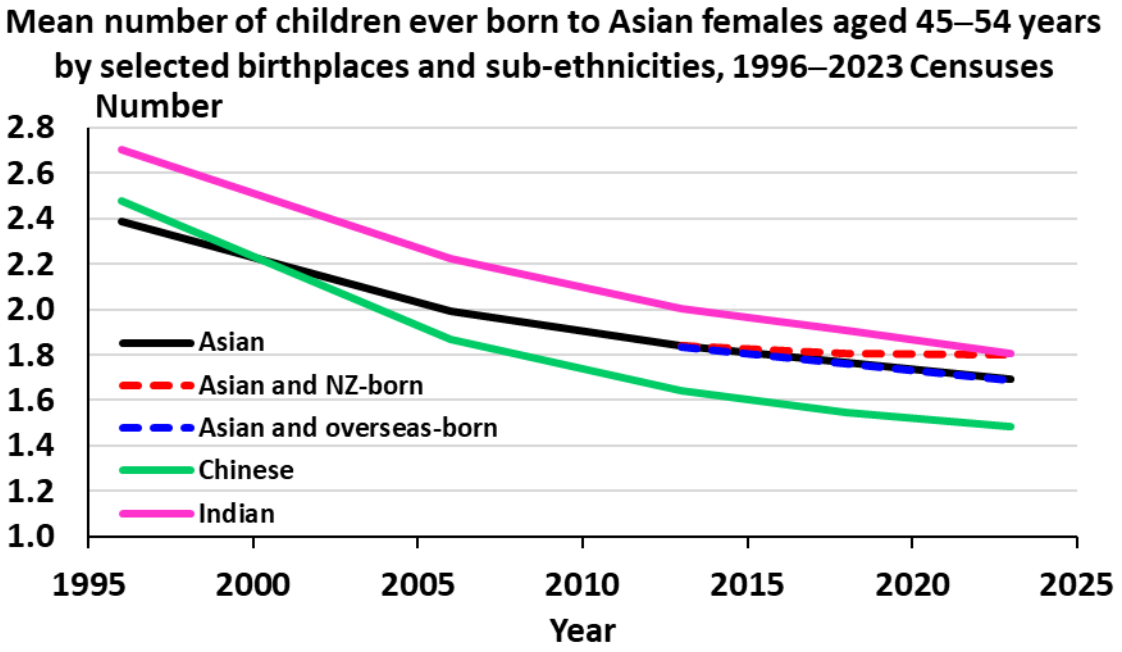
This is also evident in the increasing number and proportion of births occurring to mothers born outside of New Zealand, which has increased from 1 in 6 in the early 1980s, to 2 in 5 in 2023 (figure 8). This has largely been driven by parents born in Asian countries. Three-quarters of the Asian population was born outside of New Zealand (2023 Census), in contrast to the other major ethnic groups which are majority New Zealand-born.

Figure 8



This does raise the question as to whether fertility differentials exist between native-born and foreign-born females of a given ethnic group. At least for females of Asian ethnicity, the difference is small. Although of those aged 45 to 54 years at the 2023 Census, those born in New Zealand had averaged 1.8 births per woman compared with 1.7 births per woman for those born outside of New Zealand (figure 9). The Asian and Asian-born-outside-of-New-Zealand rates are almost the same. Indeed, for Asian females aged 45 to 54 years at the 2023 Census, 94 percent were born overseas – a much higher proportion than for the Asian ethnic group overall.

Figure 9



This is a useful reminder that these populations are open, not closed, populations. They are subject to significant churn through migration (arrivals and departures), and further churn through inter-ethnic mobility (people changing their ethnic identification over time). This does not necessarily negate the usefulness of fertility analyses, but a reminder that disaggregation is often necessary.

Heterogeneity within groups

From a pragmatic analytical perspective, it is often necessary to group categories together. However, it is unsurprising that broad ethnic groupings, such as 'Asian' or 'Pacific', can mask differentials within those groupings.

For example, clear fertility differentials are apparent between the two major Asian sub-groups Chinese and Indian. Of those aged 45 to 54 years at the 2023 Census, those with Chinese ethnicity had averaged 1.5 births per woman compared with 1.8 births per woman for those with Indian ethnicity (figure 9).

However, even these groupings can mask differentials. The Indian grouping, for example, combines those identifying with Bengali, Punjabi, Sikh, and Indian Tamil as well as those identifying with specific nationalities such as Fijian Indian, Malaysian Indian and South African Indian.

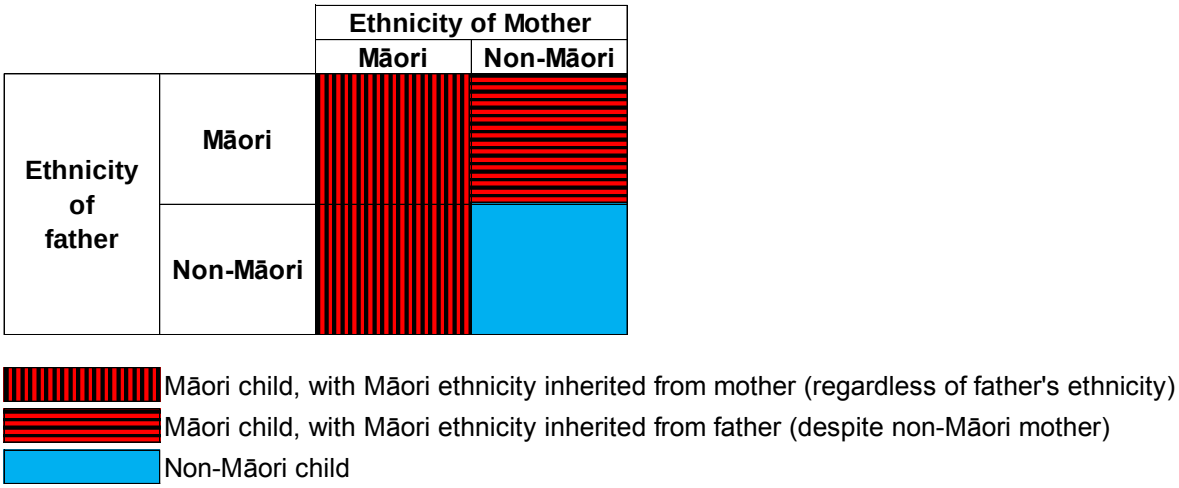
Ethnic intermarriage contributes to Māori and Pacific population growth

Ethnic intermarriage – in the broadest sentence – is a significant contributor to the growth of the Māori and Pacific populations in New Zealand. It is not immediately

intuitive that births to non-Māori women, for example, can increase the Māori population. But ‘paternity’ does indeed serve an important role in ethnic population change, where children can inherit the ethnicity of their father (as well as the ethnicity of their mother), regardless of the ethnicity of their mother (figure 10). In this example, ‘non-Māori’ is not an explicit ethnicity response, but indicates that ethnicities other than Māori have been identified.

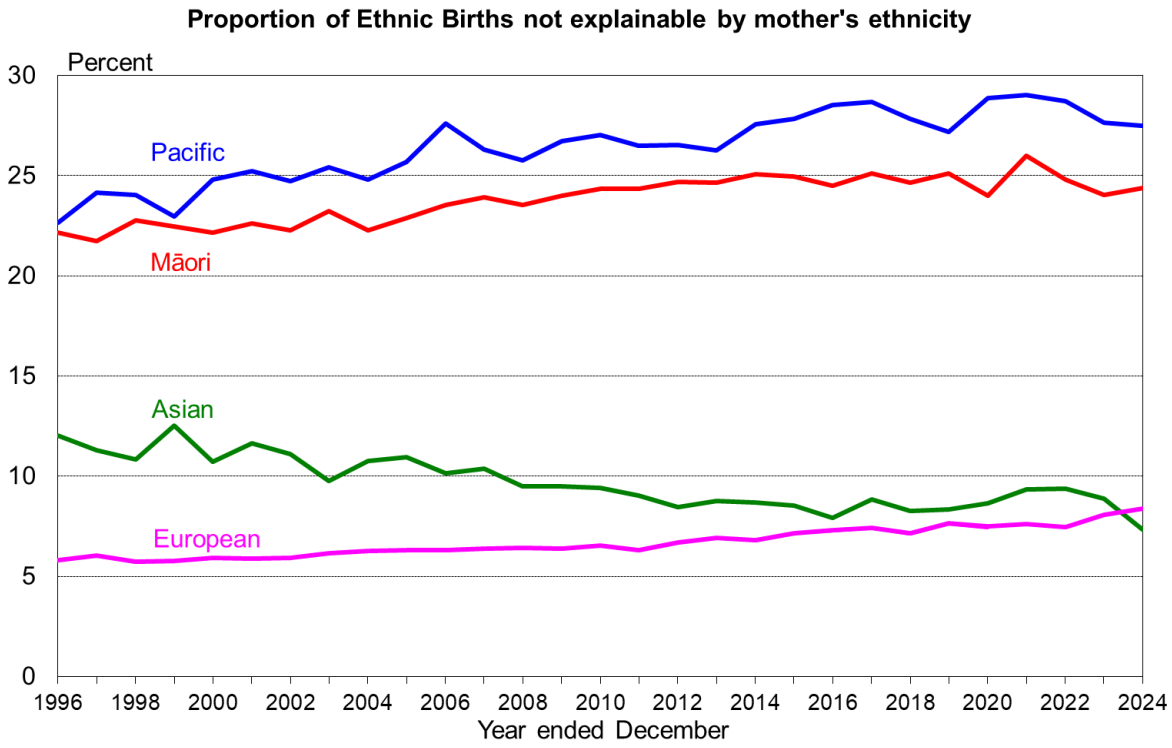
Figure 10

Example of how non-Māori mothers can contribute to Māori births and Māori population growth



One in four Māori births are to a non-Māori mother where the father is Māori (figure 11). A slightly higher proportion of Pacific births are to non-Pacific mothers where the father is Pacific. Both the Māori and Pacific proportions have increased since 1996 (when birth registration data first enables such analysis). In contrast, the proportion of Asian births that have a non-Asian mother has declined over time, indicating proportionately less intermarriage of people with Asian ethnicities, but warranting further analysis. The role of paternity is clearly important for those analysing and projecting ethnic population change.

Figure 11



Contrasting growth rates mean changing ethnic shares

The result of these sustained ethnic fertility differentials is a New Zealand population experiencing changes in ethnic composition. These changes are especially pronounced at the youngest ages, driven by births to parents with multiple ethnicities.

The fertility insights discussed here have direct implications for the fertility assumptions to be formulated in forthcoming official ethnic population projections. Further discussion of these population implications is beyond the scope of this paper, but readers are referred to Stats NZ (2022). The next update of Stats NZ's national ethnic population projections is scheduled for release on 11 September 2025.

Discussion

Period fertility measures are always susceptible to temporal social and economic factors, but the cohort measures are unequivocal: New Zealand couples are having fewer children with each successive generation. A wider array of fertility measures – including completed fertility and childlessness rates – all indicate sustained fertility declines across New Zealand's major ethnic subpopulations.

It is not clear, however, whether all ethnic populations have necessarily reached sub-replacement fertility. Period fertility measures all indicate sub-replacement fertility rates as of the early 2020s, but cohort measures are less unequivocal. Māori and Pacific cohort fertility rates are still well above replacement level for birth cohorts that have completed, or are close to completing, their childbearing.

It is also unclear whether ethnic fertility rates are truly converging. As Rarere (2024) notes, “there are other features that challenge this notion of convergence”, including different age-specific patterns.

Despite these trends, fertility patterns continue to be a key driver of changes in the ethnic make-up of New Zealand. Ethnic fertility differentials remain. It is not just differences in fertility rates, but the combination with differences in age structure and intermarriage that are important for ethnic population dynamics.

It is also evident that fertility and migration are not independent dynamics, but intrinsically linked, especially in the context of ethnic population change.

Cohort fertility measures, which capture the lifetime childbearing experience of women, are invaluable tools for understanding changes in fertility patterns. These are rarely available for sub-populations below the national-level total population because they are challenging to compile, requiring coherent births and population data over many decades.

In the absence of detailed annual cohort fertility series, census questions on ‘children ever born’ are useful for periodically measuring cohort fertility trends, including completed cohort fertility rates and childlessness rates.

Statistics New Zealand’s recent decision to shift from the traditional five-yearly census to a census based on administrative data supplemented by surveys, potentially provides more frequent and timely population statistics (Stats NZ, 2025). With more frequent ethnic population estimates, this increases the potential for more frequent ethnic period fertility measures. However, it will be more challenging to derive cohort fertility measures from birth registrations and smaller annual surveys, compared with those that are currently derived from census. Birth registrations do not capture births occurring outside of New Zealand, nor do they directly measure childlessness. Annual surveys will not measure the childbearing experience of smaller sub-populations, such as ethnic populations cross-classified by birthplace and educational qualifications, even if a fertility question is part of the questionnaire suite.

In conclusion, for countries committed to measuring ethnic fertility and population changes, the following principles may be useful:

- Recognise the extra role of paternity in ethnic population change – that ethnic populations can grow through ‘intermarriage’ and children can inherit the ethnicity of their father, regardless of the ethnicity of their mother.
- Supplement period fertility measures with cohort fertility measures which give the most authoritative measure of completed fertility rates for females born in each year.

- Disaggregate analyses where practicable, to at least understand the heterogeneity within broad groupings.
- Assess the consistency of ethnicity reporting in numerators (eg, birth registration) relative to population denominators (eg, census). Unit record linking is generally regarded as the gold standard for such assessments (Ajwani).
- Stochastic (probabilistic) projections are advocated, in preference to deterministic projections (or scenarios), because the former convey meaningful measures of uncertainty, with much of this uncertainty coming from the fertility (and paternity) components.

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