

## AUSTRALIA'S POPULATION IN 2000: THE WAY WE ARE AND THE WAYS WE MIGHT HAVE BEEN

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*This article examines the impact of post-war migration, the post-war baby boom, and the improvement in the life expectancy since the 1960s on Australia's current age structure. It shows that, contrary to frequently expressed opinion, the post-war migration program has had only a minor 'younging' effect, far less in fact than the baby boom. On the other hand, the increase in life expectancy since the 1960s has significantly increased the share of Australia's population over 50.*

### **HAS IMMIGRATION KEPT OUR POPULATION YOUNG?**

A recent episode of the SBS television documentary series, *Dateline*, featured an excellent BBC program on ageing. In introducing the program, presenter Jana Wendt stated with certainty that, because of our post-war immigration program, the ageing of Australia's population was not as advanced as it was in other countries. Wendt, in making this statement, was merely repeating conventional wisdom. That immigration has kept our population young is not only popular conventional wisdom, it is also stated by academic specialists.

Peter Saunders, Director of the Social Policy Research Centre at the University of New South Wales said in 1999:

Australia has had a population structure which has been relatively young compared with other OECD countries. Two main reasons account for this. First, Australia experienced a stronger post-war 'baby boom' in the 1950s and 1960s than many other countries. Second, and more significant as a feature of Australian demographics, was the impact of net immigration which had the initial (but lasting) effect of lowering the age structure of the population.<sup>1</sup>

In 1999 Glenn Withers, Director of the Public Policy Program at the Australian National University said:

Immigration has helped keep Australia

younger in the past. In an earlier era, Immigration Minister, Chris Hurford, saw reduced aging of the population as one of the basic rationales of the immigration program. The median age of immigrants has been lower by around five years than that of the Australian population in general. And it was believed that Australia's younger age structure, like that of other settler countries, was in substantial part a product of strong immigration levels.<sup>2</sup>

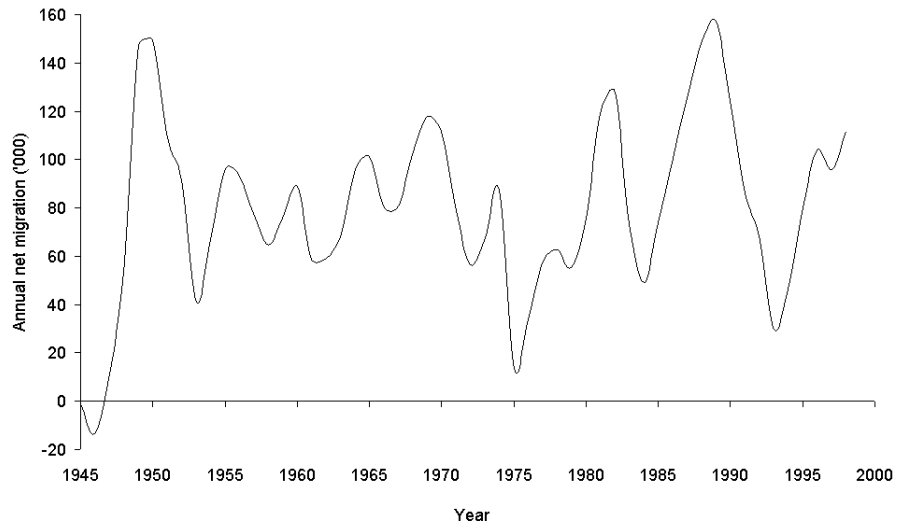
Jim Skinner, Director, Applied Population Research Centre, University of Queensland agrees:

Australia is not ageing as fast as other Western countries. That's mostly because of high overseas immigration over the years. It's given us more of a balance.<sup>3</sup>

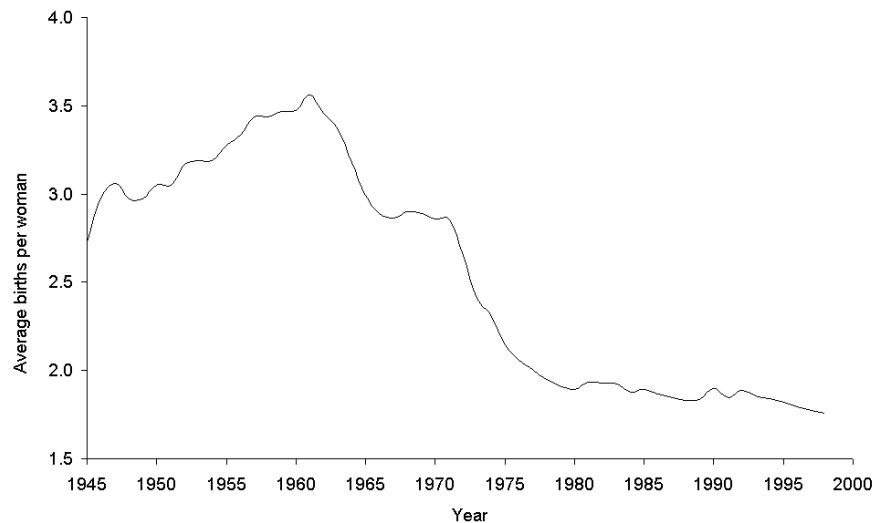
### **ALTERNATIVE PATHWAYS FOR AUSTRALIA'S PAST DEMOGRAPHY**

The proposition that Australia's population would have been much older without post-war immigration is testable. It can be tested by projecting Australia's age structure forward from 1945 to the year 2000 with the assumption that post-war net migration was zero. This can be compared with the actual age structure in 2000 to assess the impact of immigration on ageing. The test also indicates the impact of post-war net migration on the size of the population. Actual post-war net migration<sup>4</sup> is plotted in Figure 1. In this paper we consider the impact of

**Figure 1: Annual net permanent and long-term migration, Australia, 1945 to 1999**



**Figure 2: Total fertility rate, Australia, 1945 to 1998**



actual net migration against the impact of zero net migration.

The main purpose of this paper is to carry out this test; however, we also examine the effects of two other alternative paths that Australia's demography might have taken since 1945. First, as the quotation from Peter Saunders indicates, a central feature of Australia's demography

in the past half century was the baby boom. What would our population look like today if there had been no baby boom? The actual post-war fertility rates are shown in Figure 2. We consider the impact of actual fertility against the outcome of the assumption that the fertility rate was 2.0 children per woman from 1945 to 1977 but thereafter followed

actual fertility when it dropped below two children per woman.

Second, what would our population look like today if expectation of life had stayed at its 1960s' level? In the 1960s life expectancy in Australia temporarily ceased to rise and some contemporary commentators considered that we had reached the biological limits of the life span. In fact, as Figure 3 shows, expectation of life has risen sharply since the early 1970s.

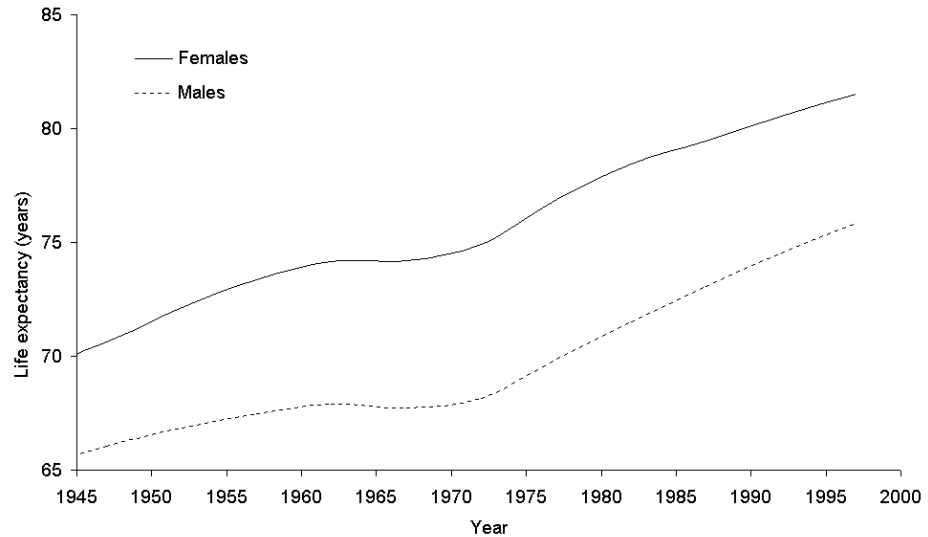
Finally, we consider what Australia's population would be like today if all three of these alternatives had applied simultaneously; that is, if post-war net migration had been zero, if there had been no baby boom and if expectation of life had not increased since 1970. While this may seem like a fanciful proposition today, a scenario like this was generally considered to be Australia's population future at the end of the Second World War in the absence of a migration program. For example, in 1949, Borrie considered that the surge of births after the war would be temporary and that the fertility rate in

Australia would fall below replacement level in the 1950s when the early marriage pattern induced by the war was replaced by the more normal 1930s pattern of marriage. He cited a population projection that had been prepared for the Australian National Health and Medical Research Council which indicated that, with zero net migration, Australia's population would rise from 7.7 million in 1950 to a peak of 8.2 million in 1980. After 1980, the population would fall to 8.0 million by the year 2000.<sup>5</sup> This is precisely the same result that we obtain in our model when all three alternative scenarios apply (see Figure 5, discussed below). The fear of this future was one of the driving forces of early post-war immigration and population policy.

### RECONSTRUCTION OF AUSTRALIA'S POST-WAR POPULATION

The first step in these experiments is to devise a model that reproduces the Australian population as it is today. We have

**Figure 3: Life expectancy at birth, Australia, 1945 to 1997**



used the standard, cohort-component population projection model to achieve this aim. The inputs to the projection used are the official June 1945 estimated population by age and sex, the recorded annual age-specific fertility rates for Australia from 1945 onwards, the recorded levels of annual net migration since 1945 and the recorded expectations of life for men and women since 1945. Rates and levels were estimated for the two-year period 1998-2000.

The model uses some simplifying assumptions. First, the model projects population in five-year age groups over five-year periods. Therefore five-year averages of fertility, net migration and life expectancy have been used. Second, we have maintained a standard pattern of age-specific mortality rates over the entire period.<sup>6</sup> The impact on the annual number of deaths of using the actual age-specific mortality rates is small. We have also used a standard age-sex pattern of net migration derived from the Australian experience of net migration in the period 1994-97. Because of restrictions on parent migration and the age criterion in the skilled

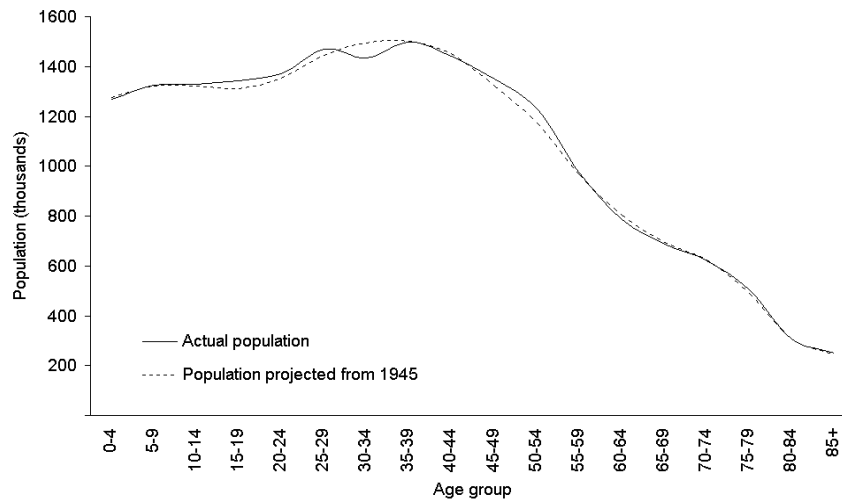
migration points system, net migration in these years is very young. There can be little argument that we should have assumed an even younger age structure.

Finally, we have assumed that immigrants, once in Australia, have on average the same fertility and mortality rates as the general population. While there are some small differences in mortality among immigrant groups in Australia, when all immigrant groups are combined, the differences in the death rates of the foreign-born from those of the total population are small.<sup>7</sup> In the past 50 years, the fertility rates of individual immigrant groups have deviated widely from those of the general population. However, again when all immigrant groups are combined, the difference between the foreign-born and the total population is small. For example, Abbasi-Shavazi<sup>8</sup> has shown that, from 1977 to 1991, the total fertility rates for the Australian-born

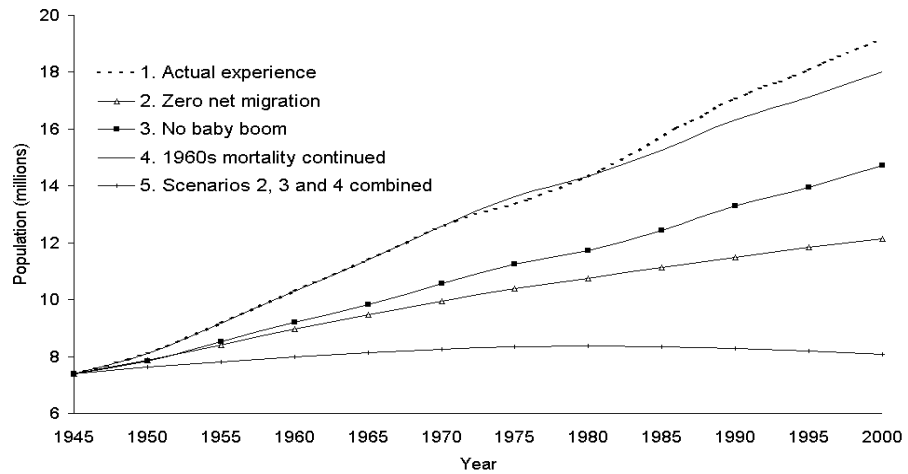
**Table 1: Total fertility rates, Australia**

	1977-81	1982-86	1987-91
Australian-born	1.9	1.9	1.8
Total Australia	1.9	1.8	1.7

**Figure 4: Comparison of actual and projected population, Australia, 2000**



**Figure 5: Projected population, Australia, 1945 to 2000**



**Table 2: Scenario by population size in 2000**

Scenario	Population size
1. Actual experience	19.2 million
2. Zero net migration (with actual fertility and mortality)	12.2 million
3. No baby boom (with actual mortality and migration)	15.0 million
4. 1960s mortality continued (with actual fertility and migration)	18.3 million
5. Scenarios 2, 3 and 4 combined	8.0 million

and the total Australian population were as in Table 1.

The implied pattern from these figures of slightly lower fertility rates for all foreign-born persons compared to those born in Australia is confirmed in other studies for earlier periods.<sup>9</sup>

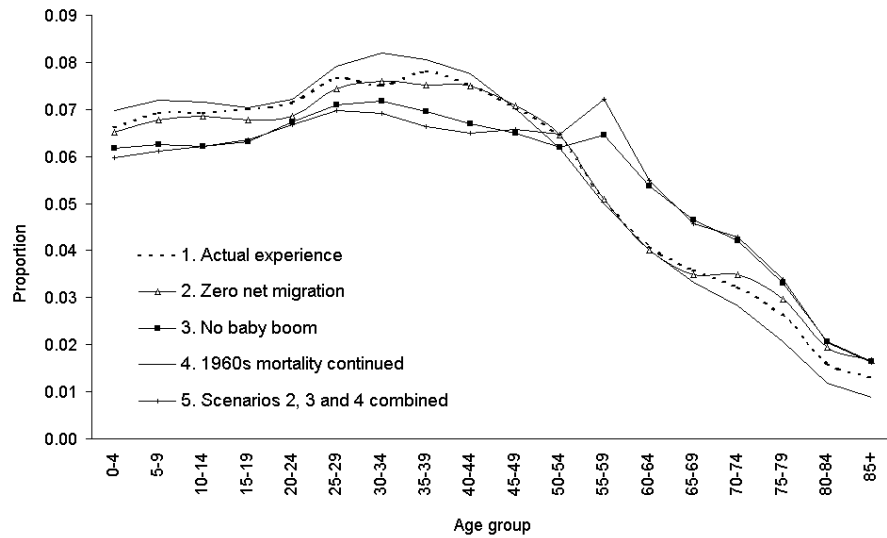
A comparison of the age distribution of the actual Australian population in the year 2000 (projected forward one year from 1999) with that of the model population projected from 1945 is shown in Figure 4. The two distributions are remarkably close, with the total populations varying by less than 93 thousand (0.48 per cent), indicating that the simplifying assumptions used have had almost no effect on the results of the projection. However, projection results have been adjusted to take account of the minor discrepancies at each age.

#### POPULATION SIZE OUTCOMES

Figure 5 shows the population size outcomes for the five different scenarios. The different population sizes in the year 2000 are shown in Table 2.

If net migration since 1945 had been zero, Australia's population in 2000 would have been seven million less than it actually is. The effect of the baby boom on population numbers is smaller. Without the baby boom, the population today would have been 4.2 million less than it is. The continued fall in mortality since 1970 has added 0.9 million to today's population. That is, 0.9 million people are alive today who would have been dead if the 1960s' mortality levels had continued.

**Figure 6: Projected population age structure, Australia, 2000**



If all three alternatives had applied, Australia's population would have remained close to its 1945 level throughout the past 55 years and today would be 8.0 million and falling.

#### AGE STRUCTURE OUTCOMES

Figure 6 shows the proportional age structures of the first three projected scenarios in the year 2000. The age structures of the actual population and of the population that we would have had if net migration had been zero are almost identical. Thus, contrary to conventional wisdom, it is evident that the effect of

post-war migration on age structure has been almost negligible.

The figure confirms the dominant effect of the baby boom upon our present age structure. The relative size of the effects are indicated by the proportion of the population aged 50 years and over resulting from the five scenarios as in Table 3.

The seven million additional people resulting from post-war migration lowered the proportion of the population aged 50 years and over by just 1.3 percentage points.<sup>10</sup> In contrast, the 4.2 million additional people resulting from the baby boom lowered the proportion of the population aged 50 and over by 6.1 percentage points (almost five times the impact of post-war migration). The simple explanation for the different impacts on the age structure of fertility and migration is that, at entry, the average age of births (exact age 0) is much lower than the average age of the population. The difference in the average age of immigrants at entry and the average age of the population is comparatively small.

**Table 3: Scenario by per cent aged 50 years and over in 2000**

Scenario	Per cent aged 50 years and over in 2000
1. Actual experience	27.9
2. Zero net migration	29.2
3. No baby boom	34.0
4. 1960s mortality continued	25.6
5. Scenarios 2, 3 and 4 combined	35.1

Lower mortality since 1970 has resulted in the proportion of the population aged 50 years and over today being 2.3 percentage points higher than it would otherwise have been.

Finally, Figure 7 shows the age distribution of Australia in 2000 divided into four components: the population that would have resulted had all three scenarios applied, the population added by lower mortality since 1970, the numbers added by the post-war baby boom and finally, the population added through post-war migration. Not unexpectedly, the lower mortality mainly added people at the older ages and the higher fertility added people at the younger ages. Migration adds people across the age distribution and, as already described, roughly in proportion to the age distribution of the existing population.

### CONCLUSION

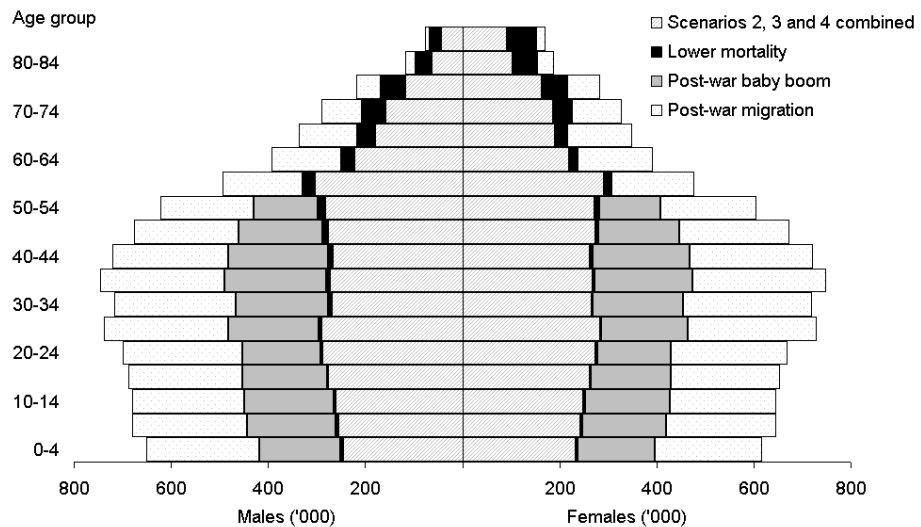
Counter to the conventional wisdom, we have shown that migration between 1945 and 2000 did not keep Australia's population young. Indeed, post-war migration

had almost no impact on the current age structure. Instead, the age structure in 2000 has been determined almost entirely by the fluctuations in the annual number of births over the past 80 years. Falls in mortality have had a small and recent impact at the oldest ages.

Although we have found that migration has had virtually no impact on age structure over the past 50 years, we have shown elsewhere that the effect on age structure of modest levels of migration is likely to be significant in the next 50 years.<sup>11</sup> For example, if annual net migration is zero over the next 50 years, the proportion of the population aged 65 and over will increase from its current level of 12 per cent, to 28 per cent in 2048. If annual net migration is instead 100,000 over the next 50 years, this will result in the proportion of the population aged 65 and over increasing to only 24 per cent, a difference of four percentage points.<sup>12</sup>

While substantial population ageing over the next few decades is absolutely inevitable, annual net migration of 50,000

**Figure 7: Projected age distribution divided into four components, Australia, 2000**



to 100,000 will have a worthwhile impact on the extent of ageing.<sup>13</sup> The reason migration will considerably reduce the degree of ageing in the future, where it has not in the past, is the fall in the fertility rate and, to a lesser extent, the fall in mortality rates at older ages. Births have a potentially large impact on the age structure because births (exact age 0) are much younger than the average age of the population. If there are relatively fewer

births, the 'younging' impact of births is lessened. At the same time, if low fertility is sustained, and life expectancy continues to increase, then the average age of the population will rise. As a result, the difference between the average age of migrants and the average age of the population is likely to become wider, thus increasing the impact of immigration on age structure.

## References

- <sup>1</sup> P. Saunders, 'Dawning of a new age? The extent, causes and consequences of ageing in Australia', Discussion Paper 75, Social Policy Research Centre, University of New South Wales, 1996
- <sup>2</sup> G. Withers, 'A younger Australia?', Discussion Paper 63, Public Policy Program, Australian National University, 1999
- <sup>3</sup> Quoted in A. Reynolds, 'Future barren without children', *The Courier-Mail*, (Brisbane) 22 September, 1998
- <sup>4</sup> Annual net migration levels are taken from net permanent and long-term migration estimates published by the Australian Bureau of Statistics.
- <sup>5</sup> W. Borrie, *Immigration: Australia's problems and prospects*, Angus and Robertson, Sydney, 1949, p. 4
- <sup>6</sup> We use the Brass two parameter logit system of model life tables and recent Australian life tables to devise this pattern.
- <sup>7</sup> C. Young and L. Ruzicka, 'Mortality', Chapter VII in United Nations Economic and Social Commission for Asia and the Pacific, *Population of Australia, Volume 1*, Country Monograph Series No. 9, United Nations, New York, 1982, p. 181
- <sup>8</sup> M. Abbasi-Shavazi, Fertility patterns of selected Australian immigrant groups, 1977-1991, PhD thesis, Demography Program, Australian National University, 1998, p. 66
- <sup>9</sup> Fertility data for mothers born from 1906 to 1931 are provided by L. Ruzicka and J. Caldwell, 'Fertility', Chapter IX in United Nations op. cit., p. 222. Data for mothers born from 1926 to 1941 are provided in C. Price, *The fertility and marriage patterns of Australia's ethnic groups, Part A*, Department of Demography, Australian National University, 1982, p. 78.
- <sup>10</sup> Note that this number includes all surviving Australian-born descendants of post-war immigrants.
- <sup>11</sup> P. McDonald and R. Kippen, *The Impact of Immigration on the Ageing of Australia's Population*, Discussion Paper, Department of Immigration and Multicultural Affairs, Canberra
- <sup>12</sup> These two projections are based on the assumption that the total fertility rate falls to 1.65 births per woman by 2008 and then remains constant and that life expectancy continues to increase in line with projections made by the Australian Bureau of Statistics. Different assumptions about fertility and mortality would obviously give different results.
- <sup>13</sup> Levels above net 100,000 make little difference to the age structure, as the impact of immigration on ageing is subject to diminishing returns.