# WHITHER TASMANIA? A NOTE ON TASMANIA'S POPULATION PROBLEM

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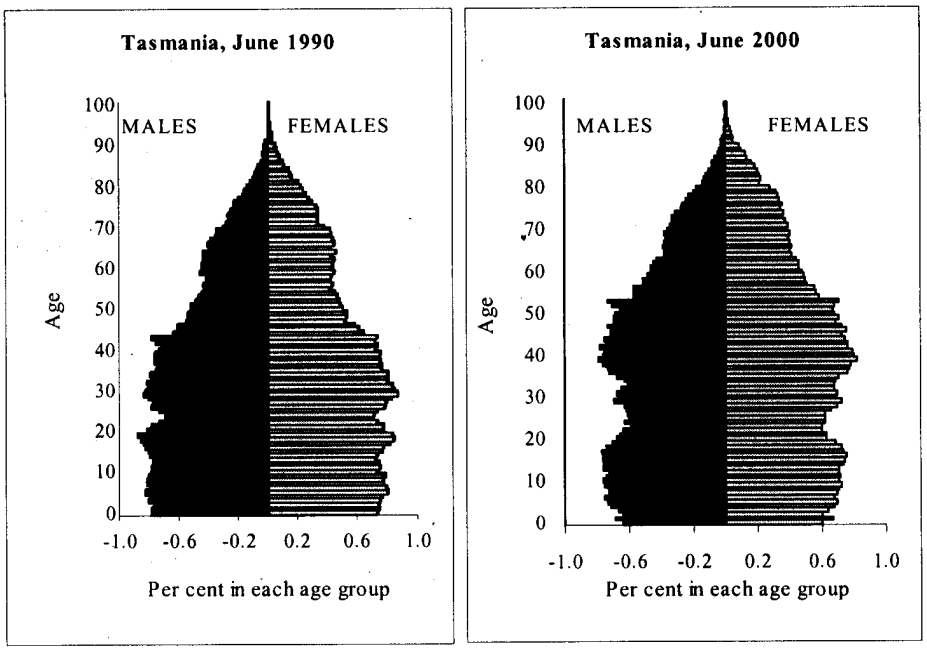
*Tasmania has recently experienced four consecutive years of net population decline. In total these years have witnessed the net loss of 4, 000 people. However, in the 18 to 38 age group category, the net loss has been substantially greater, 11,400 over the past four years, and nearly 19,000 (12.5 per cent at that age) over the past decade.*

*This paper argues that the emerging age structure, which is beginning to resemble an apple core, poses a massive threat to Tasmania's future. The paper outlines the dynamics of intrinsic (natural) population decline, projected to begin in Tasmania somewhat earlier than in Australia, and the unique problems Tasmania faces in trying to resolve this seemingly inevitable problem with replacement migration. A range of fertility and migration scenarios that would produce moderate positive growth are described, and policy issues are indicated.*

It used to be called the Apple Isle. Over its halcyon years, Tasmania also had a rounded and fertile age structure, reflecting the large baby boom cohort born in the post-war period (1945 to 1961). More recently, Tasmania has experienced four consecutive years of net population decline, and the age structure has started to resemble an apple core, with a large bite out of the key productive and reproductive 18-38 year age groups (Figure 1). In fact the loss at these ages began many years ago, but at a total population level (currently 470,000) was generally concealed by natural increase - the difference between births and

**Figure 1: Age-sex structure of Tasmania, 1990 and 2000**

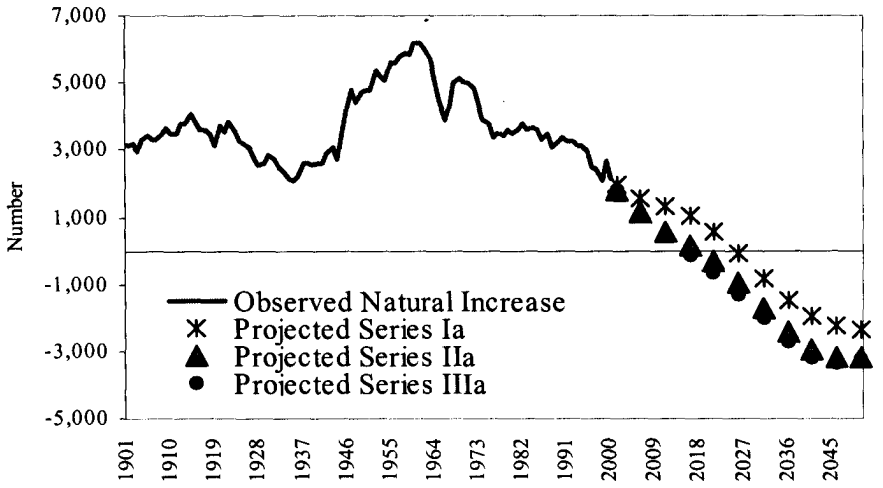



Source: Australian Bureau of Statistics: population estimates

deaths - and small but none-the-less significant net migration gains at older ages. Over the past four years, Tasmania has experienced a total net loss of 4,000 persons (all ages), but at 18-38 years, over 11,400; over the past ten years, a net cumulative gain of more than 8,000 persons has concealed a net loss of nearly 19,000 18-38 year olds. This paper argues that the emerging age structure poses a massive threat to Tasmania's future. Contrary to government pronouncements on the matter,[1] it could soon cause Tasmania's current population decline to accelerate, through bringing about the premature onset of intrinsic (natural) decline.[2]

In order to understand the potential gravity of the situation, it is necessary to first understand that at least half of the problem lies somewhat beyond the influence of the state government or any political party to alter. Contemporary population trends in all comparative regions, both throughout Australia and around the globe, reflect the inevitable outcome of the demographic transition - low fertility and low mortality, the former causing the structural ageing of these populations, the latter resulting in numerical ageing.[3] In many such countries, the combination has already resulted in deaths outnumbering births, causing natural increase to become negative, and population to begin intrinsic decline. In virtually all remaining developed countries, births and deaths are similarly on a collision course

**Figure 2: Tasmania: natural increase and projected intrinsic (natural) decline, 1901 to 2051**



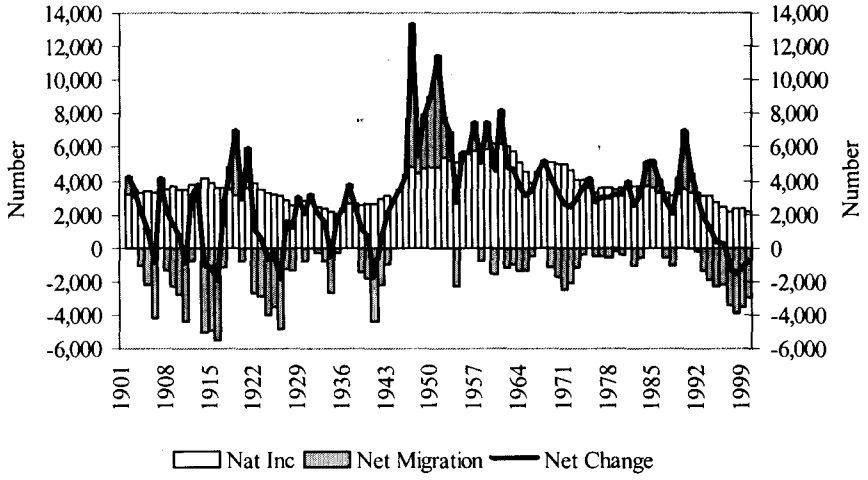

Source: 1901-2000: ABS *Australian Demographic Trends*, and unpublished ABS data
2000-2050: ABS (2000) *Population Projections*, 3222.0
Notes: Series Ia TFR 1.80 constant, ANM -393;
Series Iia TFR 1.65 by 2009 than constant, ANM -1,871
Series IIIa TFR 1.65 by 2009 then constant, ANM -3,428
All series use the same mortality assumption of one extra year of life expectancy every 10 years.
TFR stands for total fertility rate and ANM stands for annual net migration

that will see the two cross over during the next few decades.[4] In Australia, where the ageing of population is not yet as pronounced as in Europe, intrinsic decline is projected to occur around 2030. In Tasmania, the state with the second oldest age structure - soon to take over from South Australia as the oldest - intrinsic decline will occur between 2014 and 2024, *irrespective* of which set of Australian Bureau *of* Statistics (ABS) projections are used (Figure 2), earlier if current trends accelerate.

Failing a swift reversal of current trends in fertility, there is only one other factor available to ameliorate an unavoidable decline in the future size of the populations of developed countries, and perhaps more pertinently, in their working age populations (or potential labour supply) *vis-à-vis* increasing numbers of elderly. This is the third component of population change migration. Provided Tasmania's fertility rate is maintained close to its current level (1.8 births per woman), only moderate levels of 'replacement migration'[5] will be required to avoid decline in both the total and working age populations. Unfortunately, Tasmania has a history of net migration loss, rather than gain. As Figure 3 shows, Tasmania has experienced negative net migration in 64 of the past 100 years. As noted earlier, in the past this loss was offset by natural increase, especially that associated with the baby boom, and small gains at older ages. In the near future, as natural increase becomes natural decrease, positive net migration will be required to stop the population from declining.

Although many will welcome the shift to a world in which populations are declining (or at least hovering around zero population growth), the broader social, economic, political and cultural consequences of intrinsic decline are as yet largely unknown.[6] Suffice it to say that capitalism and the welfare state as we currently know them developed interdependently with - perhaps dependently

**Figure 3: Tasmania: population change by natural increase and net change, 1901 to 2000**




Source: ABS *Australian Demographic Trends*, 3102.0 and unpublished data

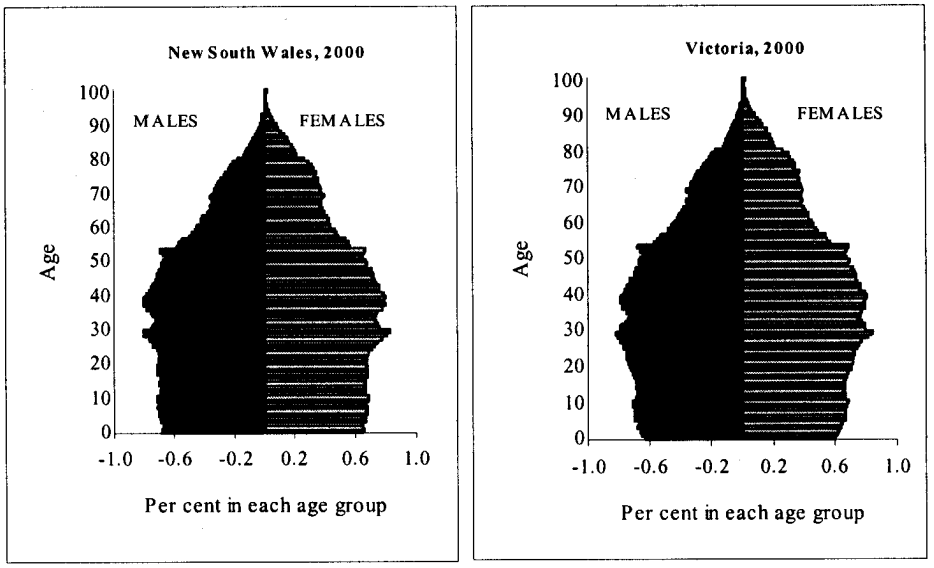
on - historically increasing labour supplies. As the projected depopulation occurs - unevenly - first on the 'developed' side of the demographic divide, it will almost certainly be accompanied by the labour shortages *vis-à-vis* growing elderly populations alluded to above. As McDonald and Kippen[7] argue, intraregional demand for labour *could* fall to match falling or stagnating labour supplies, as those with capital seek out either cheaper labour sources in the developing countries, or the last days of population growth in those developed countries that are able to facilitate this outcome. However population ageing will also alter the occupational structure of labour forces, ushering in an increasing demand for labour-intensive elder-oriented services. Since such jobs will not be readily exportable to the labour-abundant economies of the developing countries, the situation is likely to herald an increase in local employment opportunities. Regions which experience difficulty in supplementing their declining working age populations with migrants will have to turn to other alternatives, such as facilitating increased fertility (for its longer term effects on labour supply) and/or increasing labour force participation, especially among women. Regions faced with the latter options - such as Tasmania - will have an especially difficult task, as the one (increased fertility) does not currently accord well with the other (increased female labour force participation).[8]

Thus, Tasmania's current population problem is not going to go away. The working age population is already declining (having peaked in 1996), and intrinsic decline, caused by an excess of deaths over births, is just around the corner. In both the short and longer term the ability of replacement migration to offset these declines is severely compromised.

In order to appreciate more fully why the foregoing factors may foreshadow serious problems for Tasmania, we need to return to Tasmania's current age structure and its comparison with the situation just ten years ago (refer Figure 1). The deepening bite over the ages 18-38 differs markedly from the situation in most other States and Territories (that is New South Wales and Victoria as shown in Figure 4). Indeed, at its centre is the cohort born in 1971 (currently aged 31 years) - in most other States and Territories, Australia's largest. In those regions, births from this cohort - which is currently reaching its peak family formation and childbearing ages - will, for the next few years, go some distance towards offsetting the low birth rate. That is to say, even if the Australian fertility rate continues to fall over the next few years, the relatively larger cohorts born around 1971 are likely to give birth to slightly larger cohorts of babies than have been seen in recent years. This small baby blip (or echo effect) will herald the final years of the phenomenon known as the 'momentum effect',[9] and will slow the onset of intrinsic decline, and ultimately, the decline in potential labour supply, in those regions where the blip occurs.

In Tasmania, however, the bite in the age structure will work against this outcome. It goes without saying that even a high fertility rate will do little for an age structure if there are only a handful of men and women at reproductive age. Certainly if the bite deepens, the number of new entrants to the population will plummet, causing further exacerbation of structural ageing, and an acceleration in the onset of intrinsic and overall decline. Any further increase in the loss of 18-38

**Figure 4: Age-sex structure of New South Wales and Victoria, 2000**




Source: ABS population estimates

year olds will also directly exacerbate the current decline in the size of the working age population. Last but not least, a continuation of the small but disproportionate gains at older ages will also exacerbate the maturation of the population age structure, further increasing the ratio of deaths to births, and thereby the onset of intrinsic decline.

The foregoing scenario approximates those described by the Australian Bureau of Statistics in their Series 2000 population projections.[10] (Three of their projections, and the assumptions on which they are based, are set out in Figure 2.) Unfortunately, even their medium and worst case scenarios (series Ila and IIIa) may be highly conservative, in that the fertility and mortality assumptions differ only minimally from current reality. Moreover, the migration assumptions of net losses of 1,871 (Series Ila) and 3,428 (Series IIIa) per annum are, in the former case, lower than that actually experienced in each of the past seven years, and in the latter, lower than those of three of the last four years.

Media reports and correspondence in Tasmania's local newspapers indicate that the possibility of population decline on any substantial scale is being met with disbelief, even denial in some quarters. But the concept of *halving time* can show how plausible it actually is. *Halving time* is the number of years it takes for a population to halve in size, and is calculated by dividing 69.3 years by the annual rate of growth.[11] At Tasmania's 1998-1999 rate of net population decline of 0.3 per cent per annum, halving time would be approximately 231 years. If that loss were to increase to one per cent per annum, halving time would escalate to 70 years, and at two per cent per annum, to 35 years. The dynamics upon which the phenomenon is based are easy to understand. At current death rates, approximately 2.1 births per woman are required to replenish each generation (with a `generation' defined as 28 to 30

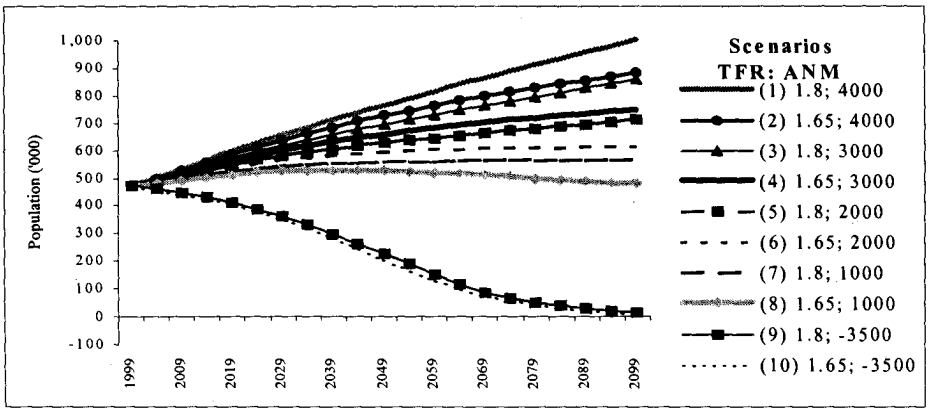
years). If each woman has only one birth, the next generation is half the size of the previous generation; the following generation one-quarter the size, and so on.[12]

However, as implied above, in Tasmania's case the *immediate* threat comes not from its moderately low birth rate, but from the premature loss of men and women of productive and reproductive age. Tasmania's situation therefore differs appreciably to that where low fertility and population ageing are the primary harbingers of intrinsic decline. In Tasmania the rate of decline in both natural increase and the size of the working age population could be at least temporarily slowed by increasing the number of men and women at the key productive and reproductive ages. This has certainly been the intended outcome of many of the state government's macro-economic policies, although the feasibility of achieving these changes has had no substantive base.

With such policy implications in mind, the remainder of this paper explores the extent to which a range of fertility and migration combinations would be able to produce positive population growth for Tasmania.[13] Net migration gains of 1,000, 2,000, 3,000, and 4,000 per annum are combined with a total fertility rate (TFR) of either 1.8 remaining constant across the projection period, or 1.8 falling to 1.65 by 2009 and then remaining constant. In all cases the same mortality assumptions are used - these being that life expectancy will continue to improve at the rate of one year for every 10 years projected. The outcome of continued negative net migration at around 1998-99 level the (3,500) against the same fertility and mortality assumptions is presented for comparison. Note that no scenario addresses the very important associated issue of population composition, that is, the fertility or replacement migration required to maintain the size of the working age population *vis-à-vis* the elderly or any other age group. Note also that for the present purposes no distinction is made between interstate and international migration, for the reason that Tasmania's international migration component is so small (in 1998-99 less than five per cent of net migration).

Projecting to 2099, Figure 5 shows that if Tasmanian fertility either remains the same as it is at present (1.8), or falls

**Figure 5: Population of Tasmania projected to 2099 according to different fertility and annual net migration (ANM) assumptions**



to 1.65 by 2009 and then remains constant, as expected; and if Tasmania continues to experience net migration losses in the vicinity of 3,500 per annum, the population will fall to under 400,000 by 2023; 300,000 by 2037; 200,000 by 2050, and 100,000 by 2065 (Scenarios 9 and 10). Under such conditions, the population of Tasmania would cease to exist in any meaningful manner well before the end of the century.[14]

It is important to note that, in these two scenarios the driving force of depopulation is the accumulated loss of persons of reproductive age (15-49 years) due to emigration, and the cumulative loss of the births that they would have had, *not the fertility rate per se.* This is clear when we compare the minimal effect of differences in the TFR depicted in Scenarios 9 and 10 with those which occur when net migration gains are assumed (Scenarios 1-8).

With a net migration gain of 1,000 per annum and constant fertility of 1.80 (Scenario 7), the population of Tasmania would immediately recommence growth and would continue to grow slowly right across the century, reaching a peak of around 565,000 in 2099. Similarly a TFR falling to 1.65 by 2009 and then remaining constant, with the same annual net migration gain (Scenario 8), would see the population peak in size around 2035 at 530,000, and thereafter decline only slowly to 480,000 (that is, higher than the current level) by the century's end. Thus, in both cases, annual net migration gains of this relatively small magnitude would be enough to ameliorate the effects of intrinsic decline and pull the population out of its otherwise inevitable downward spiral. The problem, as indicated earlier, is that Tasmania has seen net migration gains of 1,000 or more in only nineteen of the past 100 years - and only five times since 1960 (1961, 1984, 1985, 1990 and 1991).

All other rnigration/fertility scenarios in Figure 5 indicate positive growth across the century, the greatest growth, as might be expected,' from a combination of TFR 1.80 and annual net migration of 4,000 (Scenario 1). Under these conditions, the population would pass the 600,000 mark around 2020; 700,000 within two further decades; and reach one million before the century's end. However it is most unlikely that Tasmania could sustain this level of migration. Tasmania has only experienced net migration gains of close to or greater than 4,000 on four occasions over the past 100 years - the last being in 1951.

Accordingly, two further scenarios are described here. Table 1 gives the levels of annual net migration that would be required to keep the population constant at its present level (470,000), assuming a fall in fertility to 1.65 by 2009; Table 2 gives the fertility-migration combinations required to achieve a population size of 500,000 by 2009, 2019, or 2029.

Table 1 shows that to maintain the Tasmanian population at its current size, the recent net migration loss (3,882 in 1997-98; 3,555 in 1998-99; 2,588 in 1999-2000) must be immediately halved. Given that reduction to this level had not been achieved at the time of writing, the outcomes in Table 1 are already somewhat behind the line. Between 2004 and 2009 the loss must reduce to 900 per year, and between 2009 and 2013, to 600 per year. Around 2019 and 2023 assuming the former conditions have been met - Tasmania will be able to accommodate zero net migration, but thereafter, as natural increase turns seriously negative (refer Figure 2), annual net migration gains will have to be established. Between 2024 and 2028,

**Table 1: Annual net migration and fertility combinations required to maintain Tasmanian population at a constant size of 470,000**

| Year | TFR | ANM |
|---|---|---|
| 1999-2003 | 1.80 | -1,500 |
| 2004-2008 | 1.70 | -900 |
| 2009-2013 | 1.65 | -600 |
| 2014-2018 | 1.65 | -400 |
| 2019-2023 | 1.65 | 0 |
| 2024-2028 | 1.65 | 500 |
| 2029-2033 | 1.65 | 1,100 |
| 2034-2038 | 1.65 | 1,400 |
| 2039-2043 | 1.65 | 1,600 |
| 2044-2048 | 1.65 | 1,600 |
| 2049-2053 | 1.65 | 1,500 |
| 2054-2058 | 1.65 | 1,400 |
| 2059-2063 | 1.65 | 1,400 |
| 2064-2068 | 1.65 | 1,500 |
| 2069-2073 | 1.65 | 1,500 |
| 2074-2078 | 1.65 | 1,500 |
| 2079-2083 | 1.65 | 1,500 |
| 2084-2088 | 1.65 | 1,500 |
| 2089-2093 | 1.65 | 1,300 |
| 2094-2098 | 1.65 | 1,300 |

annual gains of 500 will suffice, but between 2029 and 2033 these will have to be stepped up to 1,100 per year, and between 2034 and 2038, to 1,400 per year. And so it goes. Until 2048, increasing levels of migration will be required to offset the decline in natural increase; thereafter, assuming the TFR stabilises around 1.65 and life expectancy does not alter appreciably beyond the projection assumptions, annual net migration gains of around 1,500 per annum will be sufficient to maintain population size around the 470,000 level. As noted, these scenarios depend on reversing current annual migration losses substantially, and immediately.

Similarly, Table 2 shows that to increase the Tasmanian population to 500,000 by 2009, not only would net migration losses have to cease immediately, they would have to become immediately positive to a minimum of 1,225 if the TFR remains at 1.8 (scenario 11), or 1,375 or 1,525 respectively (scenarios 12 and 13) if the fertility rate were to fall to 1.7 or 1.6 by 2009. As alluded to earlier, these data quite vividly illustrate the impact of apparently small changes in the fertility rate.

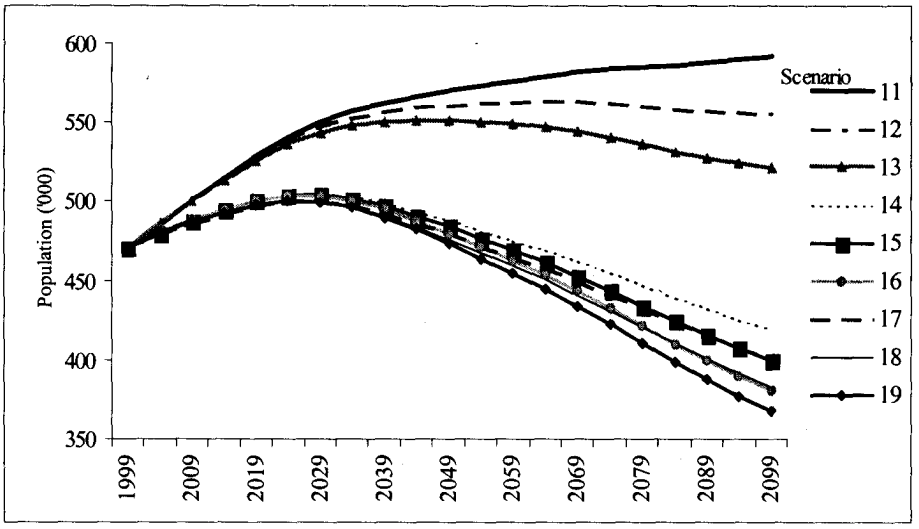
To achieve a population of 500,000 by 2019, the required annual net migration gains are not nearly so daunting; 40 with fertility remaining at 1.8 (Scenario 14), 245 with fertility falling to 1.7 by 2009 (Scenario 15), and 450 with fertility falling to 1.6 (Scenario 16). Such gains may be achievable. Similarly, with a little patience, a population of 500,000 could be achieved by 2029 if fertility remains at 1.8, and if the net migration loss is immediately reduced to 90 per year (Scenario 17). If fertility falls to 1.7 by 2009, annual net migration gains of 125 would suffice (Scenario 18), whilst with fertility falling to 1.6, annual net migration gains of 350 would be needed (Scenario 19).

An important caution must be noted here. There is a danger in setting population targets if little a *priori* consideration is also given to what occurs after the target is achieved. Figure 6 shows the longer term outcomes of the nine

**Table 2: Combinations of fertility and migration leading to a population of 500,000 by the specified year**

| Year | Scenario | TFR | ANM |
|---|---|---|---|
| by 2009 | 11 | 1.8 | 1,225 |
| | 12 | 1.7 | 1,375 |
| | 13 | 1.6 | 1,525 |
| by 2019 | 14 | 1.8 | 40 |
| | 15 | 1.7 | 245 |
| | 16 | 1.6 | 450 |
| by 2029 | 17 | 1.8 | -90 |
| | 18 | 1.7 | 125 |
| | 18 | 1.6 | 350 |

**Figure 6: Fertility and migration scenarios leading to a population of 500,000 by 2009, 2019 or 2029 and projected change thereafter**




Notes: See Table 2 for scenarios

scenarios given in Table 2. In each case the population reaches the target by the specified year, but thereafter follows a divergent path. In scenarios 11, 12 and 13 the population either continues to increase across the century, or declines very slowly. In the other six scenarios the population brushes 500,000 briefly, and then falls quite rapidly. Before embarking on a target-oriented population policy, policy-makers would need to look at a combination of the approaches implied in Tables 1 and 2. On reaching the targeted size, replacement migration would need to be immediately instituted in order to maintain the population at the desired size.

In summary, these scenarios indicate that projected population decline in Tasmania, whilst essentially inevitable in terms of intrinsic decline, can be ameliorated in the short term if interactions between births, deaths, and migration are more fully understood and appreciated.

While it is not possible to precisely control the level of migration and the number of births, policies directed to these ends can be put in place. However, the ability of Tasmanian policy-makers to turn recent trends around is being compromised by the day. For every year that the appropriate outcomes are not achieved, the potential momentum of decline will increase.

It seems especially critical that the bite in Tasmania's age structure over the 18-38 age groups becomes the focus of attempts to stem the decline, rather than the overall net loss, as has tended to be the case. The negative effect of the loss of nearly 19,000 18-38 year olds over the past ten years (or 12.5 per cent of the population of that age) is substantial. These are the people who not only constitute around half of the working age population but also have the babies that are needed to slow the onset, and reduce the impact, of intrinsic decline. In time the

babies go to school and require teachers and uniforms and paediatricians. They keep the schools and other related institutions and businesses functioning, and eventually become workers and tax payers themselves. The reproductive age population also buys the houses and household consumption goods that assist in keeping the local economy flowing and viable. This is not to say that equal attention should not be paid to, for example, attracting potential retirees to the State; they are also disproportionate purchasers of houses, goods and services. But rather, that the economic support which demography provides for demand has been taken for granted during the population growth phase of the demographic transition. This support is now being rendered vulnerable in populations that are failing to reproduce themselves. It will become especially vulnerable in those populations that will have difficulty attracting and maintaining migrants. Randomly encouraging migrants on the basis of net decline may only exacerbate the problem: in economic parlance, natural increase and migrants are not perfect substitutes.

For those countries and regions that are the first to experience intrinsic population decline - and/or zero population growth - the situation can be expected to generate new social, economic, political and cultural predicaments. According to the United Nations,[15] the emerging situation requires objective and comprehensive reassessments of established economic, social and political policies and programs. The federal government focuses on international migration as a means of offsetting low intrinsic growth at the national level.[16] This is unlikely to resolve Tasmania's atypical problems. Instead, Tasmanian policy-makers would be better advised to focus their attentions on interstate migrants.[17] Policies that promote life style advantages and offer job, housing and/or child education packages would be especially likely to attract people of childbearing age. Policies which, for example, offered for taxation purposes, corporatisation of the family (for example, income-splitting), state-funded superannuation contributions during time taken out for childrearing, and/or contributions towards HECS debts.[18] Failing success with migration, or better still, *anticipating* this,[19] Tasmanian politicians and business leaders must urgently reassess their labour force policies, such as compulsory retirement at age 65 (Tasmania is now the only Australian State to have a compulsory retirement age), and especially they must direct their attention to policies that simultaneously facilitate childbearing and enhance female labour force participation.

**Reference**


1 A very regular theme of the current (Labor) government is that `population growth will recommence in the near future, once economic growth recommences', see *The Mercury*, 18.2.00, 24.2.00, 06.8.00, 18.8.00, 19.8.00, 16.12.00.

2 The term `intrinsic decline' is used here to reflect its opposite: `intrinsic growth' or the `intrinsic rate of natural increase'.

3 Structural ageing is primarily caused by falling fertility, which results in a decline in the *proportion* of the population at younger ages and an increase in the proportion at older ages; numerical ageing is primarily caused by improving life expectancy, which results in an increase in the *number* of people reaching old age, and in turn, in the crude death rate.

*4* United Nations *Replacement Migration,* Population Division, Department of Economic and Social Affairs, United Nations Secretariat, *2000*

5 P. McDonald and R. Kippen, Strategies for labour supply in sixteen developed countries, 2000-2050, Paper presented to the 2000 Annual Meeting of the Population Association of America, Los Angeles, California, March 23-25, 2000 ibid.

6 W. Lutz (Ed.), *The Future Population of the World. What Can We Assume Today?* London, Earthscan Publications; P.G. Petersen, 'Gray dawn. The global aging crisis', in F. V. Moulder (Ed.), *Social Problems of the Modern World*, Australia, Wadsworth/Thomson, 2000, pp.126-134; United Nations op. cit; McDonald and Kippen, op. cit.

7 McDonald and Kippen, op. cit.

8 P. McDonald, 'Gender equity, social institutions and the future of fertility', *Journal of Population Research,* vol. 17, no. 1, 2000a, pp. 1-16; P. McDonald, 'Low fertility in Australia: evidence, causes and policy responses', *People and Place, vol.* 8, no. 2, 2000b, pp. 6-20

9 The 'momentum effect' refers to the potential population growth contained within the age structure. The size of each birth cohort is determined by the fertility rate *and* the number of women at reproductive age. This combination caused Australia's largest cohort to be born, not at the peak of the baby boom (1961) when the total fertility rate was 3.6, but in 1971, when it was 2.9. The main reason for this apparent paradox is that between 1961 and 1971 the number of women of reproductive age increased from 2.4 to 3.1 million, as the first of the baby boomers reached these ages. The cohort born 1971 has itself been termed an echo-effect.

10 *Population Projections, Australia,* Catalogue No. 3222.0 Australian Bureau of Statistics (ABS), 2000.

11 J. R. Weeks, *Population: An Introduction to Concepts and Issues,* Seventh Edition, Belmont, Wadsworth, 1999, pp. 11-12

12 McDonald, 2000a, op.cit; McDonald 2000b, op. cit.

13 The cohort component projection method was applied to five year age groups. The fertility and mortality assumptions were applied to Tasmania's age-specific distributions for these factors. The projections with positive migration use Australia's net migration age structure, whilst the projections with negative migration use Tasmania's net migration age structure, which is somewhat younger than that for Australia. The Australian net migration age structure was used for the positive migration scenarios in order to more appropriately reflect the impact of the potential gains. See *Migration,* Catalogue No. 3412.0, ABS, 1998-99, p. 70.

14 These outcomes are almost identical to ABS Population Projections 2000, Series IIIa

15 United Nations, 2000, op. cit, p. 4.

16 P. Ruddock, Minister's article for the Business and Higher Education Round Table on the theme 'Populate or Stagnate: Australia 2050', Economic and Environment Section, Department of Immigration and Multicultural Affairs, October, 2000

17 G. Hugo, 'Regional development through immigration? The reality behind the rhetoric', *Research Paper* 9, Commonwealth of Australia, Parliamentary Library, 1999; G. Hugo, 'Population issues in contemporary Australia: a Tasmanian perspective', Paper presented to seminar organised by ABS, Department of Immigration and Multicultural Affairs, and Netcom, Hobart, 2nd August, 2000.