PHEU Fact Sheet

Tasmanian Ageing Population Inflation Factor

Objective

To develop an inflation factor for population ageing in Tasmania that can be incorporated in health service costing models where the ageing population is an essential element in the calculation of future service/program costs.

Methodology

The latest ABS population projections for Tasmania (ABS Population Projections Australia 2002 to 2101 Cat. No. 3222.0) were used to determine an inflation figure to account for population ageing in the proposed health services planning model. Two age groups were considered: 65+ and 75+. The age group 75+ has long been regarded as the "frail-age" cutoff, whilst the age group 65+ is often cited when determining the extent of an ageing population.

The ABS projections were for the period 2002 to 2021, with discrete projected population figures provided for the years 2002, 2003, 2006, 2011 & 2021. The projections involve three separate series, with different assumptions underlying each series. The three factors implicit in each series are: *total fertility rate*, *net overseas migration* & *life expectancy at birth*. Essentially, the series differ in the conservatism of these factors. Series A is the most optimistic, in that it includes the highest fertility rate, net overseas migration & life expectancy. Series C, logically, is the most pessimistic, in that it includes the lowest fertility rate, net overseas migration & life expectancy. Series B, which is commonly used, is a compromise between the other two series.

In order to determine an average annual percentage population increase it was necessary to derive projected population figures for each of the intermediate years. To do so, linear regression models were calculated for both age-groups using each of the three projection series. It was decided, after inspection of the regression results, to limit the regression to the years 2002-2011. Fitting a linear model to these years resulted in a near-perfect fit in each instance, with adjusted R-square values of the order of 99%. From each of these linear models, projected population numbers for the intermediate years could be estimated with confidence.

The details of the regression models derived for the two age-groups considered, for each of the projection series, are:

Tasmanians aged 65+

Series A: Projected Population = 65,261.43+1,851.02*(year-2002)
Series B: Projected Population = 65,728.57+1,748.98*(year-2002)
Series C: Projected Population = 65,835.71+1,375.51*(year-2002)

Tasmanians aged 75+

Series A: Projected Population = 30,778.57+756.12*(year-2002)
Series B: Projected Population = 30,835.71+711.22*(year-2002)
Series C: Projected Population = 30,878.57+606.12*(year-2002)

The estimated populations for the intermediate years, including summary statistics, for both age-groups and each of the projection series are provided in the tables below.

Table 1: Annual population projection figures for Tasmanians aged 65+

	Projected Population Under Linear regression model			Annual % increase			Projected population where provided		
Year	Series A	Series B	Series C	Series A	Series B	Series C	Series A	Series B	Series C
2002	65,621	65,729	65,836				66,200	66,200	66,200
2003	67,472	67,478	67,211	2.8	2.7	2.1	67,400	67,400	67,200
2004	69,323	69,227	68,587	2.7	2.6	2.0			
2005	71,174	70,976	69,962	2.7	2.5	2.0			
2006	73,026	72,724	71,338	2.6	2.5	2.0	72,100	72,000	70,700
2007	74,877	74,473	72,713	2.5	2.4	1.9			
2008	76,728	76,222	74,089	2.5	2.3	1.9			
2009	78,579	77,971	75,464	2.4	2.3	1.9			
2010	80,430	79,720	76,840	2.4	2.2	1.8			
2011	82,281	81,469	78,215	2.3	2.2	1.8	82,700	81,800	78,500

Table 2: Summary population projection figures for Tasmanians aged 65+

	Series A	Series B	Series C
Average annual % increase 2006-2011---->	2.4	2.3	1.9
Max annual % increase 2006-2011---------->	2.6	2.5	2.0
Min annual % increase 2006-2011---------->	2.3	2.2	1.8

Table 3: Annual population projection figures for Tasmanians aged 75+

	Projected Population Under Linear regression model			Annual % increase			Projected population where provided		
Year	Series A	Series B	Series C	Series A	Series B	Series C	Series A	Series B	Series C
2002	30,779	30,836	30,879				30,700	30,700	30,700
2003	31,535	31,547	31,485	2.5	2.3	2.0	31,500	31,500	31,500
2004	32,291	32,258	32,091	2.4	2.3	1.9			
2005	33,047	32,969	32,697	2.3	2.2	1.9			
2006	33,803	33,681	33,303	2.3	2.2	1.9	34,000	34,000	33,600
2007	34,559	34,392	33,909	2.2	2.1	1.8			
2008	35,315	35,103	34,515	2.2	2.1	1.8			
2009	36,071	35,814	35,121	2.1	2.0	1.8			
2010	36,828	36,526	35,728	2.1	2.0	1.7			
2011	37,584	37,237	36,334	2.1	1.9	1.7	37,500	37,100	36,200

Table 4: Summary population projection figures for Tasmanians aged 75+

	Series A	Series B	Series C
Average annual % increase 2006-2011---->	2.2	2.0	1.8
Max annual % increase 2006-2011---------->	2.3	2.2	1.9
Min annual % increase 2006-2011---------->	2.1	1.9	1.7

As expected, due to the near-perfect linear fit to the ABS projections, the differences between estimated population figures and the ABS projected population figures, for the years where these were provided, were of the order of 1% or less.

Summary

As stated previously, Series B is commonly used for population projections, due to it being a compromise between the extremes of the other two population projection series. Which series is considered for the health services planning model will be based on the underlying purpose of the model. Adopting Series A will present a worst-case scenario, with regard to the demand for health services, whilst adopting Series C will present the best-case scenario. Perhaps it would be useful to have more than one model, in order to present different scenarios.

Whichever scenario is adopted, ideally the health services planning model would be *dynamic*, with scope to modify the input inflation factors each year. If this is the case, then the population ageing inflation factor of choice would be the *annual* population percentage increase for either, or both, of the two age-groups considered, as provided in Tables 1 & 3.

In the event that the model is not dynamic, a fixed number (for each age-group considered) would have to be used. Given that the model is predicting health service costs beyond the current year, then it would make sense to incorporate a static population ageing inflation factor reflecting the period beyond 2005, in this case 2006-2011. The recommended figure to use would be the *average annual* population percentage increase over this period for each age-group considered, as provided in Tables 2 & 4.

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