

INTRODUCTION OF A NEW CATEGORY
OF PARENT MIGRATION
- MODEL OF COSTS

TABLE OF CONTENTS

1	Introduction	1
2	Data	2
3	Assumptions	3
4	The Model	8
5	Results	10
6	Sensitivity Analysis	12
7	Comparison with Preliminary Estimates by DIMIA	13
8	Conclusions	15

1 Introduction

- 1.1 The Department of Immigration, Multicultural and Indigenous Affairs (DIMIA) sought the advice of Australian Government Actuary (AGA) on the financial implications of a proposal to alter the arrangements for parent migration.
- 1.2 Under this proposal, the existing queue for parent migration would be split in two, with an additional 500 places being made available for those in the existing queue and a new category introduced with an allocation of 3,500 places. The new category would involve a higher second visa application charge which is intended to provide a greater contribution towards the health and welfare costs that will be incurred by these migrants.
- 1.3 The higher charge for the new category could be required as an up front payment made on entry (the base option) or split between two payments, the second of which could be made up to two years after entry (the split VAC option).
- 1.4 DIMIA was interested in how this proposal would affect cashflows over the forward estimates period and the net financial impact of the proposal, in present value terms, taking account of both the increased revenue from the higher visa application charge and the additional health and welfare costs associated with the increased intake.
- 1.5 In order to provide this information, AGA has constructed a model which projects the costs of the migrant intake by individual year of age over their lifetimes. The model is being provided with this report.
- 1.6 This report has been prepared by Susan Antcliff, FIAA.

2 Data

- 2.1 DIMIA provided AGA with copies of their existing spreadsheets which set out the details of charges which would be applied to the different categories of entrants. DIMIA were also able to provide an age and gender distribution for those in the existing parent application pipeline.
- 2.2 The Department of Family and Community Services (FACS) provided us with information on the rates of age pension take up. The FACS website was used to obtain details of the rates of payment and indexation arrangements for the relevant pensions and benefits.
- 2.3 We also used information provided by the Department of Health and Ageing on average health costs together with published research from the Australian Institute of Health and Welfare on the progression of health costs with age.
- 2.4 The mortality rates published by AGA in the Australian Life Tables 1995-97 were also used.

3 Assumptions

- 3.1 A range of assumptions were required in constructing the model. Some of these were derived from the data described above. Others are financial assumptions where we adopted assumptions consistent with the latest long term Treasury projections. Other assumptions are to some extent arbitrary, as there is no relevant information.
- 3.2 In almost all cases, the assumptions have been included as parameters in the model to allow them to be easily changed if better information becomes available.

Financial Assumptions

- 3.3 Assumptions are required on the rate of increase in the CPI, wage costs, health costs and a suitable discount rate for calculating the present value of future cashflows.
- 3.4 We have assumed that the CPI will increase at a rate of 2.5% per annum. This is in line with the current Treasury outlook and represents the mid-point of the Reserve Bank target range for price inflation. This rate is used to inflate Centrelink benefits, Adult Migrant Education Program costs, the cost of administering the assurance of support, application processing charges and the first visa application charge imposed on applicants.
- 3.5 Note that we have not used the assumptions which DIMIA provided on a separate inflation rate for the administration costs under the purchasing agreement. It is recognised that these inflation rates are locked in under the current purchasing agreement. However, it seems reasonable to assume that over the long term these charges will need to keep pace with at least inflation.
- 3.6 Wage costs are assumed to grow by 4% per annum. This is consistent with the Treasury long term view on wage growth and is suitable for projections which extend 50 years into the future. The growth in wages is used to inflate age pension costs. Age pension payments are indexed to maintain their level at 25% of average weekly earnings.
- 3.7 Health costs have historically grown faster than the general inflation rate and this is reflected in the adoption of a separate health inflation parameter which is applied to the health costs included in the model. After advice from the Department of Health and Ageing, we have adopted an inflator of 5.9% per annum, or 3.4 percentage points above the CPI for health costs other than the aged care component. This latter component is assumed to increase at the CPI and gives a health inflation rate for those aged over 65 of 4.3%, or 1.8 percentage points above the CPI. As discussed below, outcomes are very sensitive to the assumption on health cost inflation.
- 3.8 The second visa application charge is intended to contribute towards the health and welfare costs incurred by this category of migrants. We have calculated a weighted indexation factor which reflects the rate of increase in the costs of the various programs which are accessed by the group. This gives an indexation rate

for the second visa application charge of 4.3% for the base option and 4.4% for the split VAC option. Costs of the program have been calculated using CPI indexation and indexation at this higher rate which reflects the costs.

- 3.9 In order to calculate a present value of future cash flows, a discount rate is required. Choice of the discount rate is largely a matter of judgement. The model is concerned with very long term cash flows and it is appropriate that the discount rate should reflect the long dated nature of the liabilities.
- 3.10 We have adopted a discount rate of 6%, or 3.5 percentage points above inflation. This is the rate which has been agreed with the Department of Finance and Administration as appropriate for the interest cost on Commonwealth superannuation liabilities - a similarly long dated liability. This is also very close to the current yield on ten year Commonwealth bonds (6.085% as at 1 July 2002).

Program Assumptions

- 3.11 The primary assumptions relating to the program itself are the numbers of additional entrants, the age distribution of these immigrants, the administration costs and the various charges levied on applicants.
- 3.12 We have used the figures which DIMIA advised on each of these elements, with one exception, as set out in the following table. The exception is the assumption in relation to the percentage of new category places which are taken by people in the existing queue, who have already paid the first visa application charge. DIMIA advised that 50% of the new category places were expected to be taken by existing queue members. Clearly this will not continue to be the case beyond two or three years, given the current size of the queue. We have instead assumed that 100% of 2002/03 new places will be taken by people in the existing queue and none of the places in the future years will come from the existing queue. In practice, it might be expected that slightly less than 100% will be existing applicants in the first year and some of the future years' intakes will be in the existing queue. In aggregate, the impact of this simplifying assumption is not considered to be material.

Program Element	Assumption
Number of additional existing category places	500
Number of new category places in 2002/03	2,000
Percentage of new category places for 2002/03 coming from existing queue	100%
Number of new category places for future years	3,500
Existing category second visa application charge	\$1,050
New category second visa application charge	\$25,000
Number of persons per visa application	1.77

Program Element	Assumption
First visa application charge - offshore applicants	\$1,175
First visa application charge - onshore applicants	\$1,745
Additional visa application charge under split option	\$160
Percentage of deferring split option applicants who default before making second payment after two years	5%
Percentage of existing queue who are onshore	25%

- 3.13 We have used the age distribution DIMIA provided for the existing pipeline of applicants for parent migration to model the distribution of entrants. A comparison between this distribution and that for the (much smaller) queue of people who have been approved for entry suggests that there is no significant difference in the distributions.
- 3.14 Under the split option, applicants would be able to pay a \$15,000 second visa application charge to obtain a temporary visa and then pay a \$10,000 second visa application charge up to two years later to obtain a permanent visa. Applicants would be able to choose whether to pay these two charges or to pay the \$25,000 second visa application charge up front. In addition to the second visa application charge, an Assurance of Support bond payment would also be payable. Following DIMIA advice, we have assumed that under this option, 25% of applicants would still elect to pay the \$25,000 second visa application charge. Of the remaining 75% of applicants who choose the split payment option, one third (25% of the total intake) would pay for their permanent visa after one year and the remaining two thirds would pay after two years. The assumption regarding default applies only to the group who are making their permanent visa payment in the second year. This means that 2.5% of all applicants under this option are assumed to not make the second payment.
- 3.15 Since the intention is that an additional 3,500 permanent residents would enter under the new category, an adjustment is required to the number of applicants to take account of those who default on the second payment. We have, therefore, assumed that 3,590 people would apply for entry under the new category resulting 3,500 people who pay the entire charge and qualify for a permanent visa.
- 3.16 In addition, assumptions are required in relation to the take-up and level of benefit under other Commonwealth programs. This covers programs such as the various pensions and benefits available from Centrelink, the Family Tax Benefit and Adult Migrant Education Program.
- 3.17 The following assumptions have been adopted.

Description	Assumption
-------------	------------

Description	Assumption
Level of age pension take up	79%
Annual rate of age pension	\$9,094
Level of benefit take up among working age population	39%
Annual rate of benefit for working age population	\$8,500
Level of family payment take up for dependent children	39%
Annual rate of benefit for dependent children	\$2,000
Level of family tax benefit take up for dependent children aged 0 to 17	80%
Level of family tax benefit take up for dependent children aged 18 to 24	40%
Annual rate of Family Tax Benefit	\$1,563
Level of take up for Adult Migrant Education Program	29%
Cost of Adult Migrant Education Program participation	\$4,920

Other Assumptions

- 3.18 There are a number of other assumptions incorporated in the model.
- 3.19 Health costs are the most important driver in the model. Available empirical evidence and common-sense both suggest that health costs increase with age. This is due to two factors. Firstly, morbidity increases with age resulting in increased usage of health services. Secondly, it is well documented that health costs are typically very much greater in the last year of life. Mortality rates also increase with age over the great majority of the ages leading to increasing health costs associated with the larger number of deaths at more advanced ages. The observed increase in health costs is a combination of these two factors.
- 3.20 We have disaggregated these two factors to derive non-mortality related rates of increase in health costs by age as shown in the following table.

Age Range	Increase in health costs per year of age
0 to 30	1.0%
31 to 40	0.0%
41 to 50	1.3%
51 to 60	4.8%
61 to 70	4.1%
71 or more	2.5%

- 3.21 These rates are then applied to a figure for health costs for a 65 year old who is assumed not to die, to calculate the health costs for all other ages for people who are assumed not to die. This base figure of \$3,170 has been calculated to align with the advice from the Department of Health and Ageing on the average health costs of those aged 65 to 83.
- 3.22 A further assumption is required on the relativity between the health costs of those assumed to die during the year and those assumed to survive. We have maintained DIMIA's original assumption, based on advice from the Department of Health and Ageing, that health costs for those who die at a certain age are eight times the health costs of those who do not die at the same age.
- 3.23 The figures on health costs have been derived from data on the Australian population generally. Similarly, the base mortality assumed is that for the total Australian population. However, the immigrant population undergoes health checks prior to approval and could be expected to be somewhat healthier than the general population. This should lead to lower health costs and lighter mortality. The model inputs allow for these impacts through the inclusion of an age reduction for the purposes of modelling health costs and mortality.
- 3.24 The default assumption is that this group will incur health costs and experience mortality rates equivalent to someone three years their junior.

4 The Model

- 4.1 The model is built up from a population projection based on the age and gender profile of the existing pipeline. Essentially, each entry cohort is assumed to have the same age distribution as is observed in the current pipeline (the sheet labelled *population* shows the age distribution for the existing pipeline). This allows a table of the entry population by single year of age to be derived for a given size of entry cohort. This age distribution is then split between males and females on the basis of the split observed in the existing pipeline, after some smoothing to remove the variation due to small numbers at some ages (the smoothed rates are shown in *male %*).
- 4.2 Age and gender specific mortality rates (included in *mortality*) are applied to this initial distribution to age the population over time. The result of this process is an age distribution of the population for males and females for each year of the projection (see the sheets *malepop*, *femalepop* and *totalpop* and the sheets showing the associated deaths, *maledeaths* and *femaledeaths*). Currently, the projection period is set to 60 years, by which time over 97% of the initial population is projected to have died.
- 4.3 The costs and revenue associated with each cohort are then calculated for each year of the projection based on these population projections. These calculations are done over four separate sheets:
- ◇ Revenue from the various visa application and health charges are shown on the sheet labelled *Model+*;
 - For the base option, the various charges are assumed to be collected from the entire cohort. For the split option, a default rate is allowed for among those who defer payment. The default group do not make the Assurance of Support bond payment or the second visa application charge. In addition, this group are excluded from receiving any other benefits in the other three sheets;
 - ◇ Costs which are inflated using the CPI are shown on *Model-*;
 - This covers the administration costs, including the costs of administering the Assurance of Support, as well as program costs associated with the Adult Migrant Education Program, the family tax benefit and welfare payments apart from the age pension;
 - Note that the take up rates for AMEP and the family tax benefit are incorporated in an average cost per person, while take up for other welfare payments are specifically allowed for in the formulae included in this sheet;
 - ◇ Age pension costs, which are indexed at AWE, are shown on *Model Pension*; and
 - ◇ Health costs which have their own specific inflator are shown on *Model Hlth*

- At each age and projection there are a number of people who are projected to die during the year. This group incurs a health cost of eight times (or some other multiple specified on the input sheet) the standard health cost for that age. The remaining survivor population is assumed to incur the standard health cost.
- 4.4 To allow for a different size of the first year cohort, particularly in terms of the proportion of places taken by new and old category entrants, these four sheets are duplicated for the first year cohort. In each case, the relevant sheet label includes the reference to 1st yr.
- 4.5 In addition, separate sheets have been included which allow the net impact of a single entrant to be examined.

5 Results

5.1 We have looked at three measures of the financial impact of this proposal. The first is the projected net impact on Commonwealth cashflows for the next six years. The second is the net present value of the costs for a single cohort of entrants. The third is the net present value of the entire program, assuming that the level of entrants remains constant at the proposed level.

5.2 The following table shows the cashflows over the next six years for the two options assuming that the charge is indexed in line with CPI. Note that these figures are expressed in nominal dollars, that is, they have not been discounted.

Year	Base Option (\$m)	Split Option (\$m)
2002/03	33.6	21.6
2003/04	62.1	44.4
2004/05	44.6	36.7
2005/06	24.4	21.8
2006/07	3.6	0.6
2007/08	-19.8	-23.4

5.3 If the charge is indexed in line with the CPI, it will meet progressively less of the costs incurred. This can be avoided by indexing the payment in line with the effective rate of growth in costs. The following table shows the projected cashflows when an indexation rate of 4.3% is applied for the base option.

Year	Base Option (\$m)	Split Option (\$m)
2002/03	33.6	21.6
2003/04	63.7	45.7
2004/05	47.9	39.8
2005/06	29.5	26.9
2006/07	10.7	7.6
2007/08	-10.7	-14.3

- 5.4 It can be seen that there are positive cashflows for the first five years of operation. Over this period the receipts from the health charge and other visa application charges are sufficient to offset the costs incurred. From the sixth year onwards, there is an increasing net cost to the Commonwealth. In the twentieth year after implementation, the net cost is over \$300m in current dollar terms (around \$1 billion in nominal dollars).
- 5.5 The split option provides significantly lower revenue in the first two years of operation, reflecting the delay in receipt of the second instalment of the health charge for up to two years. The gap subsequently narrows and, from year twelve, the split option involves a lower cost. This is primarily the result of delayed access to the age pension.
- 5.6 The net cost of the options is clear when the net present value is calculated for a single cohort of entrants. Based on a cohort of 3,500 entrants under the new arrangements and 500 entrants under the existing arrangements, the net present value of all future cashflows is estimated to represent a cost to Government of around \$604 million under the base option and \$602 million under the split option. These costs have been calculated by projecting nominal costs forward for sixty years and discounting back to current dollar terms. If the charge were increased by the CPI, these costs would increase in real terms for future cohorts.
- 5.7 A health charge of \$203,000 for entrants under the new category would be required to cover the costs of a single cohort under the base option (\$208,000 for the split option, assuming 60 percent of the charge is payable in the first instalment). This charge would need to increase by the weighted indexation factor if it were to continue to be sufficient to meet the costs of future cohorts.
- 5.8 Looking at the program as a whole, the net cost to Government (assuming a total cohort of 2,500 in the first year and 4,000 for each subsequent year) as measured by the estimated net present value of the next sixty years' cashflows is \$18.8 billion for both the base option and the split option, assuming CPI indexation of the charge. If the charge were indexed by the higher factor the total cost would reduce to \$17.8 billion for the base option and \$17.7 billion for the split option.
- 5.9 It needs to be emphasised that these estimates do not include any allowance for clawback from taxes paid by this group or other contributions made to the economy and the community more generally.

6 Sensitivity Analysis

6.1 We have undertaken sensitivity analysis on a range of input variables to test their impact on the results. The following table summarises our results for the most significant variables. The impact on cost is measured against the total program cost for the base option with CPI indexation of the charge as described above

Variable	Change	Impact on cost
Gap between discount rate and cost inflators	Increased by 1 percentage point Reduced by 1 percentage point	-29% +43%
Health costs inflator ¹	Reduced from 3.4% (for those aged under 65) and 1.8% (for those aged 65 or more) above the CPI to exactly CPI	-33%
Health charge	Increased from \$25,000 to \$100,000	-35%
Additional existing queue places	Reduced from 500 to 0	-17%
Pension takeup	Increased from 79% to 90%	+5%
Final year health costs multiple	Increased from 8 to 10	+4%
Pension and welfare costs	Increased by 10%	+4%
Age adjustment	Increased from 3 years to 6 years (ie health costs and mortality equivalent to someone 6 years younger)	+3%

¹ As noted in paragraph 3.7, health costs are assumed to grow more quickly for the under 65's than the over 65's where the assumption of CPI growth in aged care costs moderates the total outcome

6.2 A range of other variables were tested and found to have minimal impact on the overall cost. These included changes in the distribution between onshore and offshore applicants, the number of people per visa application, non age pension welfare takeup, AMEP usage and doubling the first visa application charge.

6.3 The key variables in terms of the estimated cost of this proposal are the economic parameters, most notably gap between the CPI and the growth rate in health costs. This latter variable is also very uncertain. It is clear that the Government is concerned about the rate of increase in health costs. It is not so clear that the growth rate will be able to be restrained.

7 Comparison with Preliminary Estimates by DIMIA

- 7.1 DIMIA had constructed a series of progressively more sophisticated costing models, with input from other Commonwealth agencies, during the earlier stages of development of this proposal. The approach used by DIMIA was fundamentally similar to that adopted by AGA, in that the models estimated the future cash flows incurred by successive cohorts and discounted these back to a present value.
- 7.2 However, DIMIA was not in a position to incorporate actuarial population projections in these models. The inclusion of actuarial population projections in the AGA costing model allows the effect of mortality on health costs to be more accurately attributed over the projection period. This has had a major impact on costs, particularly in the first twenty years.
- 7.3 With the benefit of additional time and research, it has also been possible to further refine some of the assumptions incorporated in earlier models. Additional information from the Department of Health and Ageing on the appropriate indexation factor to use to project future health costs as well as the inclusion of age specific estimates of annual health costs have led to an increase in the estimated cost of the program over the results generated by the earlier models.
- 7.4 The following table summarises the results which DIMIA had originally reported on annual cashflows and the comparable figures calculated using the AGA model.

Measure	DIMIA Costing Model ⁽¹⁾	Result from AGA Model	
		CPI Index ⁽²⁾	Composite Index ⁽³⁾
BASE OPTION			
Net Revenue	(Nominal dollars)	(Nominal Dollars)	(Nominal Dollars)
Year 1	\$39m	\$34m	\$34m
Year 2	\$72m	\$62m	\$64m
Year 3	\$63m	\$45m	\$48m
Year 4	\$53m	\$24m	\$30m
Transition to negative cashflow	Year 9	Year 6	Year 6
SPLIT VAC OPTION			
Net Revenue	(Nominal dollars)	(Nominal dollars)	(Nominal Dollars)
Year 1	\$26m	\$22m	\$22m
Year 2	\$53m	\$44m	\$46m
Year 3	\$54m	\$37m	\$40m
Year 4	\$50m	\$22m	\$27m
Transition to negative cashflow	Year 9	Year 6	Year 6

(1) (2) (3) See footnotes to table on the following page.

7.5 It can be seen that revenue is lower under the AGA model and falls more rapidly as the effect of higher health costs kicks in. As a result, the transition from positive to negative cashflow occurs three years earlier.

7.6 In adding cashflows from different years, it is important that the figures should be measured on a consistent basis (\$100 in 2002 could be expected to have considerably greater purchasing power than \$100 in 2022). Applying a discount factor to convert the numbers to the same base, typically a present value, allows cashflows from different years to be summed to get a picture of the impact of the proposal over the longer term. The following table shows the present value of projected cashflows for the first twenty years of operation for each of the two options.

	Net Present Value of Cashflows over first 20 Years		
	DIMIA Costing Model ⁽¹⁾ (2002 dollars)	AGA Model CPI Index ⁽²⁾ (2002 dollars)	AGA Model Composite Index ⁽³⁾ (2002 dollars)
Base Option	-\$0.8 billion	-\$2.3 billion	-\$2.1 billion
Split VAC Option	-\$0.8 billion	-\$2.2 billion	-\$2.0 billion

(1) Based on the DIMIA costing model used for the Parent Options Paper released for public comment in September 2001, this figure would have been \$1.2 billion. The options paper figure is higher largely because costings at that time reflected only aged parents for new category places whereas later costings (as shown) include new category places for working age parents.

(2) Second VAC indexed in line with growth in the CPI.

(3) Second VAC indexed by a composite index which reflects the growth in the various components weighted in proportion to their contribution to total program costs.

7.7 It can be seen that the reduced revenue has a major impact on the NPV of the cashflows for the first twenty years, where the AGA model suggests a cost of around two and a half to three times times that predicted by the DIMIA costing model depending upon the indexation arrangements adopted. It should be noted that the DIMIA present value figures were calculated using a discount rate of 5.5%. As noted above, the AGA figure is based on a discount rate of 6%. The 6% figure is consistent with current yields on ten year Government Bonds and also aligns with the discount rate used by AGA for other liabilities with a similarly long term nature.

8 Conclusions

- 8.1 The net impact of both the existing and proposed new category of parent immigrants is a substantial cost to Government. The health charge of \$25,000 represents about 12% of the gross costs of a single cohort of entrants, while the existing charge is about 0.5% of the costs.
- 8.2 The results are particularly sensitive to the financial assumptions. In particular, for a given discount rate, the higher the inflation rate for the various cost items, the greater the measured cost to Government will be. The inflation rate of the cost of health services is a critical assumption as health costs represent over 60% of the total cost of Government services.
- 8.3 This analysis is restricted to the tangible costs of Commonwealth Government programs which are likely to be accessed by the additional migrants. As such, it ignores the benefits which such immigrants may provide to the Australian community, both tangible (such as provision of voluntary services or taxes which may be paid on income earned and goods consumed) and intangible in terms of their contribution to the richness and diversity of Australian society. These benefits would be difficult to quantify and are beyond the scope of the current project.



Susan Antcliff
Actuary

October 2002