Strengthening the financing of aged care in Australia

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1. Introduction

1.1 The present system and its limitations

The present system for financing aged care in Australia is very heavily reliant on one source of funding, namely current tax expenditures by the Commonwealth Government. State Governments make a much smaller contribution, again from current expenditures. As user co-payments are substantially drawn from the Age Pension, they are best regarded as indirect government transfers, and so also come from current Commonwealth expenditures.

This heavy reliance on a single source of funding poses a number of problems. First, decisions about funding of aged care are subject to short term budgetary conditions; as well as reflecting the political climate of the time, these decisions will be shaped by the level of intergenerational transfers that present taxpayers are willing and able to make. A further problem is that the incentives associated with short term funding encourage providers to spend rather than to save and invest for the future, particularly with regard to future capital provision. A consequent third problem is that neither governments, providers nor individuals are encouraged to or given a mechanism to save for future liabilities, but remain reliant on intergenerational transfers rather than making investments over the lifetime of each generation.

This short term perspective and reliance on current funding is at odds with the long term nature of a number of aspects of aged care financing. Rather than being totally unknown and unpredictable, the future liabilities associated with the need to provide capital facilities, the projected growth of the aged population, and the likelihood of any individual needing to use some form of long term care over their lifetime are readily recognisable and reasonably predictable. As these elements of aged care funding can be estimated on the basis of agreed assumptions, they invite a more appropriate form of funding than the annual budget cycle permits.

It is this concern to address future costs that provides our rationale for considering alternative or additional approaches to funding aged care rather than the issue of whether or not the system is "in crisis" now and regardless of how sustainable it is in the future. If there is no crisis and the present system is sustainable, the proposed approach should be all the more affordable and simply offers an alternative means of doing what was going to be done anyway. If however the present system is coming under increasing strain, it is prudent and provident to make some arrangements to meet anticipated future liabilities.

We would go so far as to argue that the process of considering alternatives of the kind we propose may in itself make a contribution to allaying concerns about future sustainability and that raising community awareness of future liabilities and the need to make provision for them may generate acceptance of such measures, much as the debate over the adequacy of retirement incomes promoted acceptance of the Superannuation Guarantee Charge.

Against this background, the aims of this paper are:

1. to estimate the level of future liabilities for aged care, and

2. to consider some means by which other sources of funding could be developed to lessen reliance on current expenditures to meet these liabilities.

The key feature of a funding mechanism that would achieve this outcome is some element of saving which could achieve some replacement of transfers between generations with investments made over the lifetime within each generation. This paper aims to makes a new contribution to the discussion of alternative means of funding aged care by presenting an estimate of the amount of savings that would be required from present earnings to meet the cost of future care, or a sufficient part of the cost, to make a funding system worthwhile.

While the approach that we present is broadly in line with proposals made in the Mid Term Review of the Aged Care Reform Strategy in 1993 for a social insurance approach to funding to aged care, linked to the Superannuation Guarantee Charge (Department of Health, Housing, Local Government and Community Services, 1993), our model has been developed primarily to demonstrate the components of a possible system and to explore the financing outcomes that result under different assumptions. We recognise that numerous design and implementation issues would need to be considered in making changes to financing arrangements, but canvassing those issues is beyond the scope of the present paper.

1.2 The search for funding options

The search for new and more diverse approaches to funding aged care is not unique to Australia but is being pursued in a number of OECD countries (OECD, 1996). Many of these countries have relied on integrated health and social security programs funded through pay as you go social insurance, with funding of long term care sitting between these two established systems. Germany has recently adopted a specific long term care insurance scheme, with current expenditure funded through giving up one day's public holiday, while in Japan, an unpopular GST was retained largely by using it to fund the Gold Plan for aged care. Israel and the Netherlands have also used new funding arrangements to drive changes in service systems in recent years, and a Royal Commission into funding aged care is currently underway in the UK, suggesting that extensive privatisation over the last two decades has not realised the solution expected.

The search for funding options and alternatives has arisen from concerns about the sustainability of present systems in the face of uncertain economic and policy futures much more than from demographic pressures. It is this context that Australia shares with the OECD countries rather than demographic pressures. Australia is in fact the third youngest of the 23 OECD countries, with only 12% aged 65 years and over in the year 2000. Even with 18% aged in 2020, it will be younger than many of these countries already are and have been for some time, for example Sweden and the UK reached around 12% aged in 1960 and now approach 16%. Japan is ageing most rapidly, from reaching 12% aged in 1990, 17% in 2000 and fully 25% by 2020, a level that Australia will not reach even by 2040.

1.3 Focus on aged care

The analysis presented here is specifically focused on aged care provided through residential care and community care programs rather than the full spectrum of long term care including provision for younger people with disabilities.   The reasons for this specific focus are briefly:

1. the proportion of the population who will use aged care services at some time towards the end of their lifetime is much greater than the proportion experiencing disability-related support needs at younger ages.
2. the time span over which care is required is far shorter than the lifetime support needs of younger people with disabilities.
3. the support needs of younger people are different to and far more diverse than those provided to older people through aged care programs, involving as they do income support, education and employment, social support and so on.
4. a wider range of financing mechanisms is involved in providing for that wider range of support needs, including for example, accident and injury compensation schemes, and invalid and other pensions rather than the Age Pension, presenting a different set of interfaces with other publicly funded programs.
5. finally, in any aged care funding scheme that covers both residential and community care, and notwithstanding changes in the nature of service delivery, residential care will absorb the larger part of recurrent and especially capital costs, but this kind of residential care is not appropriate to the needs of younger people with disabilities.

While the consideration of a system of funding aged care separately from other long term care will give rise to questions about boundaries between systems, these questions are seen to be secondary to, and indeed the product of, other much more substantial differences between the systems of care that are to be funded.

In contrast to these differences, there are several good grounds for considering financing of aged care as an adjunct to retirement income provisions.   The Australian system of financing retirement incomes is widely regarded as having considerable strength as it draws of four separate mechanisms to achieve the kind of multi-pillars approach endorsed by the World Bank (1994).   The four pillars are:

1. **the publicly funded Age Pension** paid from general taxation and so involving substantial intergenerational transfers and redistribution on the basis of need;
2. **the compulsory Superannuation Guarantee Charge** (SGC), involving savings and transfers across the individual's lifetime, with redistribution between beneficiaries and their close associates, and specifically preserved for retirement income purposes.
3. **private savings**, again involving transfers across a lifetime, and with varying degrees of preservation for retirement income purposes; and
4. a small component of **continuing earnings**.

It was argued in the Mid Term Review of the Aged Care Reform Strategy that as needing some form of long term care is a very likely experience in the later part of retirement, it is reasonable to link provision for this eventuality to retirement income arrangements.   The SGC identifies a proportion of income to be saved in order to

supplement the basic retirement income provided by the Age Pension, and a similar approach could be adopted to cover the cost of a defined period of future care. Further, just as the SGC is not intended to provide full retirement income, separate estimates can be made to cover varying proportions or components of the cost of aged care.

It is the element of future funding that is one of the main reasons for not linking provision for aged care to the Medicare levy, which is simply a hypothecated "pay as you go" tax, with present contributions paying for present use and involving substantial redistribution on the basis of need for health care. There are also other reasons relating to the different nature of aged care services that caution against linking their funding to the health care system. It is the present lack of clarity as to how services at the boundaries of acute care and aged long term care are to be funded that poses problems in service delivery and separate funding systems are as likely to provide mechanisms and incentives for integrating service delivery as to pose barriers to this outcome.

2. Key features of proposed approach

The approach that we present focuses on community based funding for the whole population, and provides estimates of the future costs of aged care and the contributions that would be required from salary income to fund these costs at a given time. The computer model has been built around four main input elements and generates four sets of results using different funding options.

2.1 Input elements

The four input elements of our model are:

1. the **need for and future use of aged care** for each age group, which is projected on the basis of
    (1) the size of each age group at the base year and in future, taking account of fertility and migration,
    (2) the growth of the aged population, taking account of age specific mortality, and
    (3) expected life time use of aged care services, focusing on residential care.

2. the **total cost of care** is estimated on 1998 constant costs, taking account of three components of
    (1) the cost of care services such as nursing and personal care,
    (2) board and lodging, and
    (3) capital, both depreciation and new provision.

3. the **time frame** covered in the estimates presented here runs until 2051.
    (1) This is the year by which the current adult population will have passed through old age. Young adults aged 30 in 1996 will reach 80 in 2046 while those aged 40 will have reached 80 in 2036 and 95 by 2051. The

       model thus gives an effective account of future costs of care and funding requirements for the current work force age groups.

    (2)   For the individual funding option, the period over which contributions are made can be varied, with payment of contributions to begin and end at different ages. The longest period for which results are presented is 35 years, beginning at age 30 and ending at age 65, and the shortest is 20 years, beginning at 40 and ending at 60.

4. The **income base** from which premiums would be paid is taken as national wages, estimated at $300bn in 1998, based on the following sources:

    (1)   The ISC Bulletin of September 1997 indicates employer contributions of $19.9bn, at a time when employer contributions were 6% of salaries, suggesting a total salary base of $331.6bn (19.9/.06)

    (2)   The June 1998 edition of the ABS Labour Force bulletin states a total of 8,432,700 employed persons and the November 1997 edition gives all employees average weekly earnings of $593.7, generating a total annual wage of $261.2bn (593.7*8.4m*52.18 weeks)

    (3)   The ABS Income Distributions publication for 1996-97 shows mean weekly income per unit of $625, for 9,083,000 units, giving an annual total income of $296,219m.

    (4)   The 1995-96 National Accounts show a total of wages, salaries and supplements for all industries of $240,162m. Allowing for indexation of AWE to June 1998 gives a current total of $251,243.

Use of the national wage base for determining a contribution rate is similar to the Superannuation Guarantee Charge and the Medicare levy, and personal taxation, where it is the national income (as defined for the purpose at hand) which is used as the base for the levy.

While the income base in our model is limited to wage earners in the workforce, it is recognised that the income base could be extended to the total population to age 65 on an income tested basis. This extension would capture the increasing numbers who are withdrawing from the workforce before age 65 with relatively high retirement incomes, and could be justified on equity grounds as those remaining in the workforce on equivalent incomes continued to contribute. Noting that the German long term care insurance system collects contributions from those of pensionable age, and that this is also a feature of the proposed Japanese system, a further extension could be made to include a contribution on an income tested basis to say age 70. Collection of contributions from these expanded income bases and over a longer period would reduce the contribution required from the wages base accordingly, possibly in the order of 10-15%.

2.2 Outputs and funding options

Our model estimates two outputs:

1. the **fund required** to meet the total cost of care, and

2. the **rate of savings or premiums required** to meet the future cost is estimated as a proportion of national wages.

Our model enables projections for four funding options:

1. A **Pay As You Go** model (PAYG), which estimates the amount needed to pay for the cost of services used in the year in which they arise; thus, for example, the amount to be raised from contributions in 2020 is the amount required to meet the costs of care in 2020. This approach is similar to that recently proposed by McCallum et al (1998) for a separate system of funding the additional future cost of aged care, based on a identified contribution from taxable income.

2. A **uniform PAYG** model is adopted to moderate the uneven rates of contribution that would arise in a standard PAYG model due to the uneven growth of the aged population and consequent costs of care.

3. A **fully funded model**, which goes beyond the uniform PAYG model to accumulate sufficient funds to pay the remaining costs incurred in future years by the then retired population even when contributions cease.

4. While we are primarily concerned with a population approach, with community based funding, an **individual funding solution** can also be estimated.

Further details of the input parameters used for estimating the future need and use of aged care are discussed in Section 3 and the details of the cost estimates are discussed in Section 4 before presenting the results for these outputs under the four funding options in Section 5.

3. Future need for and use of aged care

3.1 Population growth and population ageing

The demographic basis of demand for aged care stems from the high probability that sizeable proportions of present adult cohorts will reach age 80, and that substantial number will live beyond that age. It is this pattern of normal survival to very old age that should make provision for aged care a much more widespread matter for concern than it is among present adult age groups.

3.1.1 Growth of the total population over next 40 years is considered in our model as we take account of both contributors to funding, aged under 65, and beneficiaries who in the main will be aged over 65, and especially over age 80. The baby boom cohorts that reached middle age through the 1990s are of particular interest as there will be an ageing boom as these large cohorts reach retirement around 2010 and advanced old age from around 2030.

The base population used for our projections is the 1997 population estimated by applying the Australian Life Tables for 1994-96 to the 1996 Census data for individual ages, to age 110, with an adjustment factor applied to match the ABS Series III Projections for 1998. Projections were then made to 2051 and then

matched with the ABS projections. The population data for 1997 and 2051 are set out in Table 1.

3.1.2 Mortality Given the size of present adult cohorts, mortality rates sets the first parameter for estimating the cost of aged care as they determine the proportion of each cohort that is likely to survive to the age at which care may be needed. In Australia in 1994-96, life expectancy at birth was 75.2 years for men and 81.1 years for women. Even with no further improvements in life expectancy, just over half of all Australian girls born in the mid 1990s can expect to reach 80 years and over. More immediately, with figures for further life expectancy at age 65 of 15.8 years for men and 19.6 for women, it can be expected that more than half the current middle aged and older cohorts (40+) will reach age 80 years and over in the next three decades.

Table 1: Population 1997 and projected for 2051

Age		1997			2051		
From	To	Females	Males	Total	Females	Males	Total
0	4	629.0	663.3	1292.3	527.2	556.5	1,083.7
5	9	641.1	647.5	1315.6	537.8	568.5	1,106.3
10	14	640.5	672.0	1312.5	553.5	584.7	1,138.2
15	19	630.5	664.0	1294.5	584.9	618.0	1,202.9
20	24	675.2	697.5	1372.7	638.4	671.5	1,309.9
25	29	725.7	728.5	1454.2	668.8	696.5	1,365.3
30	34	714.7	711.0	1425.7	689.8	709.4	1,399.2
35	39	741.3	737.8	1479.1	697.1	712.5	1,409.6
40	44	692.4	688.8	1381.2	701.1	714.2	1,415.3
45	49	640.2	649.7	1289.9	721.5	735.4	1,456.9
50	54	536.5	557.7	1094.2	753.9	767.9	1,521.8
55	59	419.8	432.8	852.6	777.2	789.4	1,566.6
60	64	362.8	359.9	722.7	761.8	765.3	1,527.1
65	69	351.3	335.8	687.1	729.6	720.3	1,449.9
70	74	328.0	280.8	608.8	661.5	631.5	1,293.0
75	79	255.5	190.0	445.5	627.4	559.2	1,186.6
80	84	178.8	108.8	287.6	537.4	425.6	963.0
85	111	150.8	65.3	216.1	728.7	406.2	1,134.9
Total		9.314.1	9218.2	18,532.3	11,897.6	11,632.6	23,530.2

Source: 1997 figures from ABS Population Projections 1997-2051, Catalogue No. 322.0. p.50

Improvements in mortality were allowed in our projections to give an approximate match with the ABS 1997-2051 Series III projections, as detailed in Appendix 1A. There has been some recent discussion of the need to allow for greater improvements in mortality at very old ages (Higgins, 1998), and it is these cohorts which are of greatest relevance to the present exercise.

While fertility and migration have an impact on the proportion that the aged will comprise of the total population, fertility has no effect on the main figures of interest here, namely the number of survivors at old ages from cohorts already born and aged at least 25 years and over. As most migration is at younger ages, future migration of

individuals under age 30 will not contribute substantially to the need for aged care until some 50 years hence, and older age migration is small and will have only a minor effect. The fertility and immigration assumptions used in our projections are detailed at Appendices 1B and 1C.

3.1.3 Gender differences are a conspicuous feature of life expectancy at birth and at older ages. Women's greater survival, and the associated lower likelihood of having a spouse caregiver available in very old age contribute to women's higher likelihood of using aged care services compared to men. A major feature of any system of aged care funding is thus a substantial redistribution from men who have participated in the paid workforce to women who have not. One option in our model enables estimation of the savings that either a man or woman would have to make to cover their different expected levels of aged care service use, and we then make calculations for a person, to average out these gender differences.

3.2 Likelihood of using aged care

3.2.1 Lifetime probability

Estimates of the lifetime probability of using nursing home or hostel care have recently been reported by the AIHW (1997). The AIHW estimates have been made on the basis of present use of the existing level of provision by the current resident population and aged population. The age distribution, gender balance and dependency profile of these populations is thus taken into account.

The likelihood of using either a hostel or nursing home is higher for women than for men, and shows steep gradients over the older age range. Focusing on nursing home use, men have a 21% chance of use over a lifetime, increasing from 27% at age 65 to 40% at age 80 and 61% at age 95. For women, the lifetime chance is 35%, and increases from 41% at age 65 to 61% at age 80 and fully 95% at age 95. Chances of hostel use are lower than those for nursing home care, and the gender differences and age gradients are less pronounced.

Table 2: Likelihood of using residential care over a lifetime and at older ages(%)

	Lifetime	At 65	At 80	At 95
Hostel care *				
Males	13	17	27	41
Females	28	33	51	45
Persons	21	25	42	44
Nursing home care*				
Males	21	27	40	61
Females	35	41	61	95
Persons	28	34	53	86

Source: AIHW, 1997, p.251; * estimates include both permanent and respite care

In contrast to these figures showing quite high probabilities for the use of residential care over a lifetime, only a small proportion of the aged population are in residential care at any one time. Currently, only some 9% of the Australian population aged 70 years and over is in residential care. It is this latter figures that has given rise to the common but erroneous view that use of residential care, or aged care services more generally, is the experience of only a minority. When lifetime probabilities are considered, using residential care becomes much more a majority experience, and especially for women.

3.2.2   Health and social trends affecting use of residential care

As is the case for use of health care services in general, future use of aged care service is unlikely to be simply a continuation of present patterns. Trends in health status and social changes affecting the availability of family care might well be expected to bring about changes in future use of aged care services. There are however other considerations that suggest limits to the scope for such change.

With regard to **changes in health status**, the available evidence suggests that recent improvements in life expectancy at older ages in Australia have been seen some improvements in disability free life expectancy rather than extended periods of severe handicap (Mathers, 1997). To the extent that use or residential care is associated with severe handicap, these trends suggest that projections based on current utilisation patterns may over-estimate rather than under-estimate future use, but their main effects are more likely to associated with earlier changes in the onset and course of chronic disease than in the use of residential care which is concentrated in a short period near the end of life.

Using US data to model lifetime nursing home use under assumptions of better health, Laditka (1998) has shown that better health did not change the proportion of later life spent in a nursing home or the percentage of cohorts who entered nursing homes. It appears that improvements in morbidity, handicap and mortality in younger old age will rather mean that more reach very advanced ages, and it is at these ages that use of residential care prior to death becomes most common, but seemingly stable.

Use of nursing home care appears to be related less to where and how long people live with severe handicap, and more to where they die. Data for 1996-97 show that close to 90% of nursing home stays of residents admitted for permanent care end in death (AIHW, 1998), and several indicators suggest that use of nursing home care associated with imminent death has been very stable for some time. It is estimated that deaths in nursing homes in 1996-97 accounted for just over 25% of all deaths over age 55, a figure little different to the findings of 1982 study (Howe, 1982), allowing for some conversion to nursing homes of what were then other facilities providing equivalent long term care, such as small rural hospitals. The proportion of all deaths occurring in nursing home compared to hospitals increases steeply with advancing age, largely due to transfers of patient with very poor prognosis from acute care to long term care. Some two thirds of all nursing home admissions occur on discharge from nursing homes, and while this figure has remained stable over the last decade, it could increase if changes in hospital use generate more discharges of very old patients to nursing homes. It is thus changes in these care practices that will affect use of nursing home care as much if not more than trends in handicap.

Turning to the effects of **social changes** on the likely availability of family care, a number of limiting factors can again be noted. First, while much is made of increases in female workforce participation, these rates are already high in Australia, having increased from 36% in 1966 to 55% in 1996, with a projected further increase only to 60% by 2005. Participation rates for women aged 50 to 55 are higher, at 65% and are projected to increase to 75%, but actual and projected participation rates fall markedly from age 55 to 60, to around 40%, and are very low over age 60. Second, a substantial proportion of women's workforce participation is part time. The importance of flexible work arrangements that allow work and caregiving to be combined is highlighted in the Victorian Carers Project which found that carers who worked had better well-being than those who did not, with carers reporting that work provided relief from caregiving (Murphy et al, 1997).

Third, the experience of multiple demands of child rearing, work and care for elderly parents has been shown to be the exception rather than the rule. A detailed Canadian analysis (Rosenthal, Martin-Matthews & Matthews, 1996) has shown that for each five year cohort of women from age 35 to 65, the highest proportion with a dependent child in the household, a job, and providing care to a parent, was 6%, at age 40 to 44. The authors note that as their analysis was only for those with living parents, the proportion for the total population would be even lower. Generational patterns of childbearing and the timing of workforce participation mean that these roles tend to be sequential rather than overlapping. As Australian demographic and social patterns are broadly similar to those of Canada, these findings can be applied locally, and while the nature of future social changes and their effects on family care for frail elderly parent may be difficult to predict, it is likely that the scale of such effects would be marginal and gradual.

3.2.3 Estimated bed day use

On the basis of the AIHW probabilities, we have estimated bed use for each age and gender group, and our model provides for care covering bed use set out in Table 3. Three features of these figures warrant note:

1. The variations in gender differentials over the age range are consistent with other data reported in the Nursing Home Statistical Overviews (AIHW,1998), with higher use for men than women at ages 60-64 but with women's use then increasing at a greater rate as age advances to almost double that of men from age 80.

2. These figures refer to estimated use for the whole population and so do not represent the length of stay of those who are actually admitted. Length of stay in residential care has been shown to be highly skewed, with most nursing home residents having short stays and a small group having long stays; however, the small long stay group, around 10 per cent, have been found to account for more than half of all the bed days used (Liu, 1996). Changes in the length of stay distribution, especially a reduction in the long stay group, would thus have a more significant impact on total bed day use than would changes in probability of admission. Recent research however suggests that identifying those likely to

have very long stays at the time of assessment and directing them to alternative modes of care is not an easy task (Howe & Gray, 1997).

3. A number of further indicators point to considerable stability in the use of nursing home care over the last ten years.   First, the rate of admissions from among the population aged 70 years and over has remained virtually stable from 1988-89 to 1996-97, at around 30 admission per 1000.   Over that period, the ratio of bed provision declined from 60 to 48 beds per 1000 aged 70 years and over, and this admission rate has been maintained only by increased turnover in the available beds.   Increased turnover has in part been attributed to growth of respite care admissions, in line with policy measures to promote respite care, including a higher respite care benefit.   Assessing the impact of respite admissions on overall use is however confounded by two factors: first, some of the increase appears to be due to the identification of a proportion of the short stay admissions that were already occurring as respite admissions, and second, some 40% of respite admissions became permanent at the first admission, with subsequent stays approximating those of permanent residents (Choi & Lui, 1998).   Further, while an increase in respite admissions would be expected to increase the proportion of short stays in the distribution of length of completed stays for all nursing home use, this distribution has hardly changed.   A review of data on all separations available for seven of the nine years above shows that the proportion of stays of less than 8 weeks and greater than 5 years remained remarkably constant, at around 38% and 10% respectively.   This stability suggest that, notwithstanding policy driven changes in provision and respite care, other factors affecting use of nursing home care at the end of life create a steady state.

Table 3: Estimated bed day use per annum, by age and gender

Age		Females	Males
From	To		
60	64	2.7	3.0
65	69	2.7	2.7
70	74	6.7	5.8
75	79	18.4	12.2
80	84	47.8	27.8
85	89	99.6	58.7
90	111	176.1	105.3

Using current utilisation for the projection of total costs and the associated funding rates presented below can be considered as providing best first estimates.   It is recognised that changes in health and social factors may well change patterns of use, but any attempt to predict these effects would introduce greater uncertainty.   Projections on the basis of current patterns at least provide a known starting point for subsequent modeling under alternative scenarios.

Given the strong association between use of nursing home care and deaths, the first point that might be addressed is to vary usage rates to take account of the changes in mortality that are allowed for in the ABS projections. Because our projections allow

for declining mortality but use constant age specific rates of usage, they may over-estimate the time spent in residential care. One alternative approach would be to make projections on the basis of projections of the number of deaths at different ages rather than population projections.

4. Estimating future costs of aged care

Three methods are available for projecting the future costs of aged care, each of which has a number of advantages and limitations. Comparison of estimates using the three different methods can however give some confidence in projections and point to the effect of factors accounting for any differences.

4.1 Projecting total expenditure

In 1995-96, expenditure on aged care by the Commonwealth, States and Territories totaled $3,185.7m. An estimates for the current year made on the basis of projecting this figure at the rate of real growth experienced over the two years prior to 1995-96, 8% (following AIHW, 1997, p. 267, Table 8.20) yields a figure of $4,013.1m for 1998-99 in constant 1995-96 dollars.

The main advantages of this method are that it is based on published data and includes all aged care programs, that is, assessment, the Home and Community Care Program (HACC), Community Aged Care Packages and residential care. The main limitations are that:

1. the figures for government expenditure do not include the contributions paid by individuals;
2. the 1995-96 base year is prior to the introduction of the new funding arrangements in 1997 and the integration of nursing homes and hostels, and
3. it is not possible to distinguish capital costs separately from the other costs of care.

The effect of including contributions paid by individuals is seen when the 1998-99 estimate of $4013.1m given above is compared with the estimate of $4,854.2 made by McCallum et al (1998). Allowing for their inclusion of individual contributions accounting for about 20 per cent of total expenditure and the 1997 changes, the two estimates are broadly consistent.

4.2 Cost of residential care per place

A second basis for estimates is to use the current cost per place in residential care and the proportion of all costs accounted for by residential care. The cost for residential care can be estimated using the benefit levels set for the Resident Classification Scale and including the resident contributions and the accommodation charges (see Appendix 2), and so is both current and all inclusive. However, the limitations are that as the RCS distribution has not yet stabilised, it either has to be approximated or an average used, and the proportion of all costs accounted for by residential care may change either as a consequence of changes in use in response to the new charging

arrangements or related policy changes such as the expansion of high level community care packages.

4.3 Actual cost experience

The third approach is to base estimates on the actual cost experiences of providers. While recognising that costs incurred by providers are broadly constrained by funding available and regulation of charges that can be imposed on individuals, the advantages of this approach are that it is current and reflects full costs, including resident contributions and capital costs. The limitation is that costs per user are only readily available from residential care providers.

Approaches were made to a number of residential care providers in Melbourne operating both high level (previously nursing home) and low level (previously hostel) facilities and data obtained to enable estimates of care costs, living costs and a depreciation component for capital. The capital cost estimates were of particular interest given the focus on capital in the 1997 changes to residential care funding. The figures derived from the provider data and used for estimating the cost of residential care are set out in Table 4.

The average actual cost per residential care place was estimated at $665 per week. This figure is close to the funding for RCS level 4, which is $635.81 a week including the resident fee and accommodation charge or concessional supplement. Given the small proportion of all residents at the higher RCS levels 1 and 2, compared to the larger numbers at lower RCS levels 5-8, this figure is accepted as a realistic average and so used for projections. The cost of sustenance or board and lodging is close to the standard resident contribution, linked to the Age Pension, and the capital cost in line with the accommodation charge or concessional supplement.

Table 4:   Estimation of actual average costs of residential care

Space required per resident	
Building area per resident	50 sq. metres
Ratio of land to buildings	2
Land area per resident	100 sq. metres
Capital costs	**$**
Land costs	50 per sq. metre
	5,000 per bed
Buildings	85,000 per bed
Effective life of buildings	25 years
Costs per person per week	**$**
Depreciation	65
Sustenance/Board & Lodging	150
Care	450
Total	665

Details of the sources for the assumptions for capital costs are given in Appendix 3. The costs per week were derived from the accounts of 5 Victorian Institutions.

The final elements in financial modeling are the rates of interest and wage and cost increases to be used. On the basis of precedent in related work (Walsh & de Ravin, 1995), published sources, current experience and conventional conservative practice, the figures adopted are:

- Interest   8%
- Wage increases 4%
- Cost increases   4%

4.4 Relationships between cost and use

A final point that needs to be made before presenting our results is that there is a multifaceted relationship between use of aged care and costs. Both government and individuals make choices in this area, with individual choices about using services influenced in part by the share of costs to be met from private resources relative to public subsidies.

As Gregory (1993) has emphasised, changes in the cost of aged care resulting from government policy decisions are far more erratic than the steady growth of the aged population.   The period 1981 to 1985, for example, saw a very rapid increase in the real cost per nursing home bed due to extra inputs, compared to a gradual growth of the aged population and a stable level of bed provision, but this cost growth moderated from 1995.

While it remains a task for the future to model costs under different policy scenarios, projections based on a continuation of present costs provide a necessary starting point for assessing the impact of alternative policies.

5. Results

5.1 Total costs

The results of our projections for total costs are set out in Table 5 and plotted in Figure 1 (see final page).

Table 5: Total costs of care projected from 1988 to 2048 ($m 1998)

Year	Total beds	Capital required $m	Care costs $m	Total costs $m
1998	141,741	382	4,918	5,301
2008	188,473	463	6,540	7,003
2018	235,224	433	8,162	8,595
2028	308,376	950	10,701	11,651
2038	423,690	996	14,702	15,698
2048	519,631	871	18,031	18,902

Several points in these projections of total costs warrant note:

1. Both care costs and total costs expand steadily, with a surge following the year 2030, which is about the time baby boom cohorts reach age 80.

2. Capital costs vary as a proportion of total costs over time, with the peak about 2035.

3. In real terms, the cost of residential care in 2048 may be more than three times the cost in 1998. Although actual dollar estimates differ somewhat, this scale of increase is very similar to McCallum and others estimate for 2046 of total expenditure of $14,643m (in 1994-95 constant dollars), which is three times their 1999 figure. It seems desirable to plan to address this expanding and predictable financial liability while those who will benefit are still able to contribute to the cost of their future care.

5.2 Funding options

The contributions required from national wages to meet the cost of aged care under the three options modeled are set out in Table 6.

The rates determined for these options involve calculations based on present values. The present values of the costs are determined by discounting the projected amounts, and similarly the present values of the national wages base amounts are calculated. The funding rates are then the ratio of the two present values.

Table 6: Rate of contribution from national wages required to fund aged care for Pay As You Go, Uniform PAYG and Fully Funded Options

	Required rate of contribution as % of national wages		
Year	Option 1: PAYG	Option 2: Uniform PAYG	Option 3: Fully funded
1998	1.8	-	-
2008	2.4	2.0	4.8
2018	2.9	2.2	3.9
2028	4.0	2.5	3.7
2038	5.3	2.7	3.7
2048	6.4	3.0	3.6

5.2.1 Option 1: Pay As You Go

The dramatic rise in the rate required for a PAYG model is a result of the assumptions used, but serves to demonstrate the prospect of a seriously increasing burden of the cost of aged care on the community.

These results are broadly consistent with those reported by McCallum et al (1998), allowing for differences in methods of projections, assumptions made and time scales of projections. Their projections give a total contribution rate of 3.2% of participating taxable income (excluding those earning less than $25,000 and those under age 25) for 1998, rising to 3.39% by 2011. In order to fund the *growth* in expenditure from 1999, they propose an average contribution of 1.1%.

5.2.2   Option 2: Uniform funding

One way to level out the impact of the cost would be to set up a fund, much like a defined-benefit superannuation fund. Contributions are made into the fund, costs are met from the fund, and interest is earned on the balance. If contributions were made as a uniform percentage of total earnings, without requiring a positive fund balance at the end of the period, the rates required would be as set out for Option 2 in Table 6.

Compared to funding on a PAYG basis as presented in Option 1, the option of a uniform funding basis evens out the rate of increase as the higher rate earlier on builds up a fund to cover later liabilities.

5.2.3   Option 3: Full funding

A third funding option would be to increase the contribution rate, so that by a certain time a fund would be in place to cover the future financial needs of that part of the population then aged over (say) 65. Thus, to reach a fully funded position by 2035, the rate needed on a PAYG basis in 2035 is paid now. The result is set out as Option 3 in Table 6 and a comparison with the PAYG option is graphed in Figure 2 (see final page).

Features of the fully funded option are:

1. Higher rates than the uniform funding option to build up reserves.

2. Initially higher rates than the PAYG option but lower and more uniform rates in the longer term, reflecting the lower cost arising from having more time in which to create the required funds; the fact that this reduction is not steeper is a result of the increasing value of costs to be met.

3. Compared to the other two options, the fully funded option achieves a reduction in intergenerational transfers.

4. It also gives increased security of benefits which are fully funded until the contributing cohorts exit.

5. The time at which the rate falls below the cost for the PAYG model is about the time that the wider health care system will face the greatest pressure from population ageing, increasing the importance of having a buffer for aged care.

6. Over the long term, the fully funded option is less sensitive than the PAYG options to any variations from the rate of interest and wage and cost increases assumed in our model (see Appendix 4). The interest rate is irrelevant to the PAYG options and variations from the assumed rates of increase in wages and costs make no difference to the outcomes as long as costs and wages move together. The effects of any increase in costs ahead of wages would only be felt gradually and would have to be sustained over a long term to have a substantial effect. For example, a 1% increase in costs without a corresponding increase in wages would add 60% to the contribution rate at the 50 year mark. The fully funded model is more sensitive to any reduction in the gap between interest earnings and cost and/or wages, but over the long term however, the impact on the contribution rate is less than for the PAYG model.

5.2.4 Option 4: Individual funding

A community-based solution seems desirable, as

1. The need for and cost of care is independent of wealth; this is in contrast to most insurance, which is taking out in recognition of the size of financial liabilities.

2. It is far more expensive for some members of the community than others and if left to the individual to choose, there would be an incentive for an individual to leave the problem to others.

However, an indication of the percentages of salary needed by individuals to make provision for their own aged care is given in Table 7.

Results of this option show:

1. The much heavier cost to females is clear. This is a result of both their greater longevity and their greater usage of aged care.

2. The rates per person are the separate rates weighted by population. This gives the same result here as a straight average.

3. It should be noted that there are significant differences between the calculation methods used for population as against individual funding. For population funding, the income base used for premiums paid to funding e.g. national wages is assumed to grow at a uniform rate. For individuals, allowance must be made for cessation of premiums if the individual dies. Pay-as-you-go and Uniform funding have little meaning for individuals, as the ceasing age for premiums will probably be long before residential care is required. Similarly, births and migration have no meaning for individual funding. Finally, the individual is presumed to be able to on-sell accommodation when it is no longer required, whereas in the other options capital costs are spread across all users.

Table 7: Salary savings required for individual funding of aged care

Premiums		Assumed			
Start at age	Finish at age	Base salary	Males	Females	Persons
30	60	30000	1.0	2.3	1.6
35	60	33100	1.1	2.7	1.9
40	60	36500	1.4	3.3	2.4
30	65	30000	0.9	2.1	1.5
35	65	33100	1.0	2.4	1.7
40	65	36500	1.2	2.9	2.1

6. Further options for funding full or part costs of aged care

While the results presented so far cover the full cost of aged care, there are some grounds for making future provision for only part of the total cost of aged care. Most generally, because of the number of assumptions that have to be made to determine premiums and the long lead time, there is likely to be some difference between the fund generated from premiums and actual costs at a future date. The consequences could be:

1. If the fund is below requirements, it will either need topping up from public or private funds, or quality of care will have to fall.

2. If the fund exceeds requirements, quality of care might increase, there could be cost inflation, or some funds could be redirected to other purposes.

3. If the fund has been established to provide for the full cost of aged care, it may be locked in and prove difficult to supplement, or to redirect reserves to other uses.

6.1 Funding only capital and a standard base level of care

More specific grounds for funding only part of the full cost of care stem from the different nature of the components making up that full cost of care. Consideration of these issues identifies the components that might be most appropriately covered or excluded.

6.1.1 Basic living costs are taken as covering board and lodging, including food, heating, clothing, and so on. In residential care, these costs can be grouped as hotel or infrastructure costs, and the basic resident fee which is set in relation to the Age Pension can be seen as meeting these costs in a manner similar to the Age Pension for those living in the community. The Age Pension accounts for 18.3 per cent of the total cost of Category 3 residential care (see Appendix 2).

This basic living cost component has three particular features:

1. The Age Pension can be seen as setting a *standard amount* for these costs in line with community views of adequacy of standards of living.
2. As almost all older individuals (excepting recently arrived migrants) will have an income equal to or greater than the Age Pension which can be taken into account in covering the cost of aged care, this cost component can be regarded as *a constant.*
3. Further, the level of this cost component will be largely *determined by costs of living* and pensions applying at any time in the future.

For these reasons, the basic cost of living can be exempted from the cost of care to be covered in advance. A further reason for exempting the component covered by the Age Pension is that it limits both the opportunity to use forward funding simply to substitute for the cost that would otherwise be linked to the Age Pension, leaving scope for additional charges to be made from the Age Pension or equivalent income, with a consequent inflation of the price of care unrelated to the actual cost of the board and lodgings component. Exclusion of the Age Pension allows a pension-linked co-payment to be maintained, or if the Age Pension component is included, there should be an offset against the cost of pensions.

6.1.2 Cost of care will vary for individual residents at any one time, and will also vary over time. In considering future funding arrangements for the cost of care, it is useful to distinguish the minimum care benefit as a *base care cost,* with all residents receiving at least that level of care, and a *variable care cost* equivalent to the difference between this base level and the cost of higher levels of care. Costs of care are the main component in the cost of residential care, accounting for 71.5 per cent of the total cost at Category 3. Of the Category 3 benefit of $84.28, $21.81 is identifiable as the cost of a base level of care, equivalent to the lowest level of RCS funding, and $62.47 is the variable cost. The base level care cost thus accounts for 18.5% of the total Category 3 cost and the variable care cost accounts for 53%. As both the standard resident contribution and the accommodation charge are constant, care costs account for higher and lower proportions at other levels of care.

Several features associated with the variations in care costs can be identified.

1. Factors accounting for variations in care costs include the resident's level of dependency, the types of care deemed appropriate, and the cost of care inputs, reflecting wage levels in the health sector, contemporary nursing and care practices and technologies available.
2. While estimates can be made on the basis of the cost of care for resident at the middle of the care classification range and at constant prices, these factors have been found to be subject to considerable change over time (Gregory, 1993). As the health price index has increased ahead of the general consumer price index in recent years, care costs might be expected to increase in future and so are difficult to predict with a degree of precision.
3. As care costs are recurrent costs, mainly salaries, they will also reflect the more general economic climate at future dates.

Because of their variable nature, estimating costs of care over time is difficult, and any provision for care costs is likely to require supplementation to meet contemporary standards. It might be noted that in the unlikely event that provision was made to

cover costs to a level higher than actual costs at some future time, the effect could be to inflate costs to absorb available funds.   These considerations suggests that it may not be advisable to attempt to provide for the full care cost, but that it may be more appropriate to cover at least a base level of care which would provide a floor under higher levels of care.

6.1.3 Capital costs involve both the cost of land and the cost of buildings, and construction of new facilities as well as refurbishment of existing facilities.   Since late 1997, an Accommodation Charge has been included in the cost of residential care, set at $12 a day.   For a Category 3 resident, this accounts for 10.2 per cent of the total cost.

Several features of the capital costs of aged care make it especially appropriate for provision through a forward funding scheme.

1. There appear to be limitations in the extent to which providers are able or willing to use funds for long term capital development, even when funding has allowed for this purpose.   The state of present facilities indicates that there has been considerable variation in the provision that providers have made for capital maintenance and refurbishment. Capacity to use profits and to raise funds for future new development is also variable, and in particular, areas which are unattractive to providers in both the private and not for profit sectors have remained underserved.
2. The large amounts involved in capital outlays require that government or industry have some means of making forward commitment. In the past, this has been done by government grants from a capital program, and fund raising and borrowing by operators.   Capital grant programs have been especially subject to fluctuations from year to year in line with government policy changes and other political and economic influences.
3. Capital expenditure is long lasting compared to recurrent expenditure on board and lodging and care.   Typically, capital facilities are considered to have a lifetime of 40 to 50 years, with refurbishment once over that lifetime.
4. Unlike the other cost components which are spent on individual residents, capital facilities are shared across many residents and beyond the occupancy of any individual resident, making a pooled funding arrangement more appropriate than an individualised one .
5. Capital funds for provision of new facilities need to be centrally managed at least in part to achieve planning goals for the equitable distribution of facilities in relation to need.
6. The attempt to require residents to fund a substantial level of capital through payments of accommodation bonds has proved highly unacceptable to the community and politically unsustainable.

6.1.4 Adjustments to estimates

If adjustments are made to exclude the Age Pension or equivalent component, the estimates of funding requirements presented above would be reduced by around 20 per cent.   Exclusion of the variable component of the cost of care would result in a reduction of around a further 50 per cent on average.

Coverage of capital funding at 10 per cent of total cost and a standard base level of care at 20 per cent of total cost would be achievable on a fully funded basis with a contribution rate as low as only 30 per cent of the estimates presented above. On the basis of the estimates in Table 6, this rate becomes 1.4 per cent of national wages in 2008 and falling to around 1.08 per cent from 2028.

6.2 Inclusion of community care

While our model so far has focused on residential care, the cost of community care can be factored in. It is recognised that it is important to include provision to cover the cost of community care so as not to create a bias towards residential care. Determining the total cost of community care and making projections is however more difficult that for residential care due to the lack of standard cost basis for funding services or a formula for user contributions. A simple alternative method can however be used to obtain a first approximation.

Community care currently accounts for around 25% of total Commonwealth and States expenditure on aged care, depending on how funding for Community Aged Care Packages and assessment services are apportioned. The results obtained above could simply be inflated accordingly to cover total costs, or as this amount approximates the share of user contributions to residential care, around 20%, the cost of community care could be seen as substituting for the effect of excluding user contributions through the Age Pension or equivalent.

7. Conclusions

Two sets of conclusions drawn from this analysis suggest that the model proposed could strengthening the financing of aged care in Australia in a number of ways.

First, with future liabilities for the cost of aged care set to increase at least three fold in real terms as present middle aged cohorts progress to advanced old age, there are good grounds for taking steps to make some provision for these known future liabilities in advance. Although the results presented here are a first run of our model, we are able to conclude that:

1. There are several options for strengthening financing arrangements for aged care to meet future estimated costs, ranging from a Pay As You Go approach that is close to present financing from tax expenditures to a fully funded model that is similar to a fully funded superannuation scheme.

2. Although only indicative, the rates of contribution we have estimated to cover the full cost of care range from a low of around 2 per cent for the early years of the PAYG and uniform funded options, up to 5 to 6 per cent for the early years of the fully funded option and later years of the PAYG option. These rates appear reasonable in relation to the Medicare Levy and the Superannuation Guarantee Charge.

3. While a fully funded scheme was found to require the highest rate of contribution from payroll in the short term compared to the other options, the rates converged

over time and the fully funded option gained an advantage in the longer term. It also has advantages of reducing intergenerational transfers and providing greater security of benefits, and on these grounds emerges as a preferred option.

4. Within each of the options presented, there are further options as to whether the full cost or only part of the cost of aged care is to be met by the funding scheme with the balance to be met by a mix of user contributions and tax expenditures. The need for long term planning for capital development, and the limited effectiveness of past and current arrangements to address this issue satisfactorily, identify the capital component of aged care financing as especially appropriate for a funded scheme. A minimalist option covering capital and a base level of care would more than halve the rate of contributions required.

Second, our analysis suggests that consideration of a new approach to financing aged care on at least a partially funded basis would strengthen financing on four further grounds that are seen more generally as criteria for sound social policy:

1. It would provide for *diversification* rather than relying almost entirely on a single source of funding, just as retirement income provision has diversified away from reliance on the Age Pension.

2. It would make each generation more *independent* of other generations by replacing intergenerational transfers with transfers over the lifetime of each generation.

3. It is also *separates* the time at which payments are made from the time at which care services are needed, drawing on income at the time of earnings and providing savings to purchase services at a time when resources are likely to be limited. This separation not only avoids the need to impose user charges at the time of use of services, but can also even out fluctuations in the capacity of the community to fund current costs at any one time due to fluctuations in economic conditions and so gives a degree of stability.

4. A community based scheme is seen to be more *equitable* than the recently introduced user pays arrangements which fall unduly on a small group of the population and draw heavily on a much smaller income and asset base than a scheme funded from a national payroll base.

This paper has aimed to make a contribution to the growing debate about alternative approaches to financing aged care in Australia (see Savage, Fine & Chalmers, 1998; Howe 1997). This conference of the Productivity Commission is one of a number of forums in which these issues are being debated; other bodies involved include the Australian Association of Gerontology, Aged Care Australia (the major voluntary sector industry body), and the Australian Institute of Actuaries. At Commonwealth Government level, the formulation of a National Strategy for an Ageing Australia should provide a forum in which the debate can be taken up. Internationally, a forum is provided by the OECD which has begun to canvass the issues of long term care insurance in its wider reviews of policies for care of the frail aged (OECD, 1996) and labour market and social policies (Kalisch, Aman & Buchele, 1998), and further

developments can be expected in the forthcoming OECD report, *A Caring World: The New Social Policy Agenda.*

The approaches proposed in this paper are open to further development in many areas, and we hope to see other options and approaches identified in the continuing debate about financing of aged care.

Acknowledgements

We express our appreciation for the costing data and other information provided by the following individuals and organisations:

Aged Care Australia: Ms Maureen Lyster and Ms Odette Wanders

Anglican Homes: Mr Tony Gribble and Ms Imas Thompson

Cantwells Real Estate: Mr Michael Williams (valuer)

CNG Atley: Mr Lawrence Atley (architect)

KLCK Architects: Mr Derek Pitt (architect)

Lynden Court Aged Care: Ms Elizabeth Short

Royal Freemasons' Homes of Victoria: Mr Charles Lewis

Southern Cross Victoria Aged Care: Mr Michael Dillon

Uniting Church Lodge Program in Victoria: Ms Margaret Reimer and Mr David Simmons

Appendix 1:   Assumptions for population projections

A. Mortality Improvements

Determined to give an approximate match to ABS 1997-2051 Series III

B. Fertility Assumptions

Fertility rates per 1000 females
Source ABS Projections of populations of Australia 1997-2051 3222.0 p 25
Low Assumptions

	Age						
From	15	20	25	30	35	40	45
To	19	24	29	34	39	44	49
Year							
1997	19.5	63.1	114.9	105.6	44.3	7.6	0.3
1998	18.9	61.5	112.4	105.0	45.3	7.8	0.3
1999	18.4	60.1	109.8	104.5	46.3	8.1	0.4
2000	17.9	58.6	107.3	103.9	47.3	8.3	0.4
2001	17.3	57.1	104.8	103.2	48.2	8.5	0.5
2002	16.8	55.7	102.4	102.6	49.0	8.7	0.5
2003	16.3	54.3	100.0	102.0	49.9	8.9	0.5
2004	15.8	52.9	97.6	101.3	50.7	9.1	0.5
2005	15.3	51.5	95.2	100.7	51.4	9.3	0.5
2006	14.8	50.1	92.9	100.0	52.2	9.4	0.6

C. Migration Assumptions

Migration profiles : permanent arrivals
Source ABS Projections of populations of Australia 1997-2051 3222.0 p 35
Percentages of migrants at each age range

Age From	To	Females	Males	
0	4	4.7	4.8	
5	9	4.0	4.1	
10	14	3.5	3.5	
15	19	3.6	2.8	
20	24	5.9	3.6	
25	29	8.1	6.6	
30	34	7.2	6.5	
35	39	5.0	4.6	
40	44	3.2	3.1	
45	49	2.0	1.9	
50	54	1.4	1.2	
55	59	1.5	1.1	
60	64	1.3	1.2	
65	70	1.9	1.7	
Totals		53.3	46.7	100.0

Total migration numbers pa 000s
Source ABS Projections of populations of Australia 1997-2051 3222.0 p 33
Low rates

1997	78.0
1998	70.0

Appendix 2: Current funding arrangements for residential care

Victoria, 1998
Source: Commonwealth Department of Health and Family Services.

1. Benefits paid by Residential Care Scale Category

Category	Daily Subsidy	
1	108.50	
2	97.94	1-4 are approx. former nursing home level
3	84.28	
4	57.31	
5	34.29	
6	28.41	5-8 are approx former hostel personal care and
7	21.81	hostel care only (category 8)
8	nil	

2. Basic Resident Fee

In addition to these subsidies, all residents pay at least the basic resident fee of $21.52. Where the resident pays any additional means tested care fee, this amount is offset against the subsidy paid, so total income to the home does not increase.

3. Accommodation Charge or Concessional Resident Supplement

In addition again, there is $12 per day accommodation charge, paid either by the Commonwealth as the concessional resident supplement, or as the means tested accommodation charge.

4. Total costs per day

The total amount available **per day** to cover all costs is

	Category 3		Category 4	
Care Subsidy				
- base level (equiv Cat. 7)	$21.81	18.5%	$21.81	24.0%
- variable amount	$62.47	53.0%	$35.50	39.1%
Total care subsidy	$84.28	71.5%	$57.31	63.1%
Basic resident fee	$21.52	18.3%	$21.52	23.7%
Accom. Charge	$12.00	10.2%	$12.00	13.2%
Total per day	$117.80	100.0%	$90.83	100.0%
Per week	$824.60		$635.81	

Appendix 3: Building Costs

Costs of building are supplied by Mr Derek Pitt of KLCK Architects (12 cases)
and Mr Lawrence Atley of CNG Atley. These are costs inclusive of consulting
fees and furnishings, and thus represent a complete cost to the provider.
Prices are indexed to 1998 using Average Weekly Earnings.

Year	Area sq m	No of Beds	Total cost $	Cost per bed $	AWE Index	Area per bed sq m	Cost per bed $1998
1993	1552	34	2567000	75500	1.1472	45.6	86600
1993	1485	30	2418000	80600	1.1472	49.5	92500
1993	3223	60	5601000	93350	1.1472	53.7	107100
1994	1298	30	1994000	66467	1.1156	43.3	74200
1994	2565	50	4083000	81660	1.1156	51.3	91100
1995	1288	30	2182000	72733	1.0677	42.9	77700
1996	2283	48	3661000	76271	1.0461	47.6	79800
1996	1407	30	2822000	94067	1.0461	46.9	98400
1996	2655	52	3973000	76404	1.0461	51.1	79900
1996	2167	45	3199000	71089	1.0461	48.2	74400
1996	2021	30	2970000	99000	1.0461	67.4	103600
1997	2017	45	3117000	69267	1.0412	44.8	72100
1997	2461	52	3637000	69942	1.0412	47.3	72800
Average	2032	41.2	3248000	78950		49.2	85400

Building costs per bed
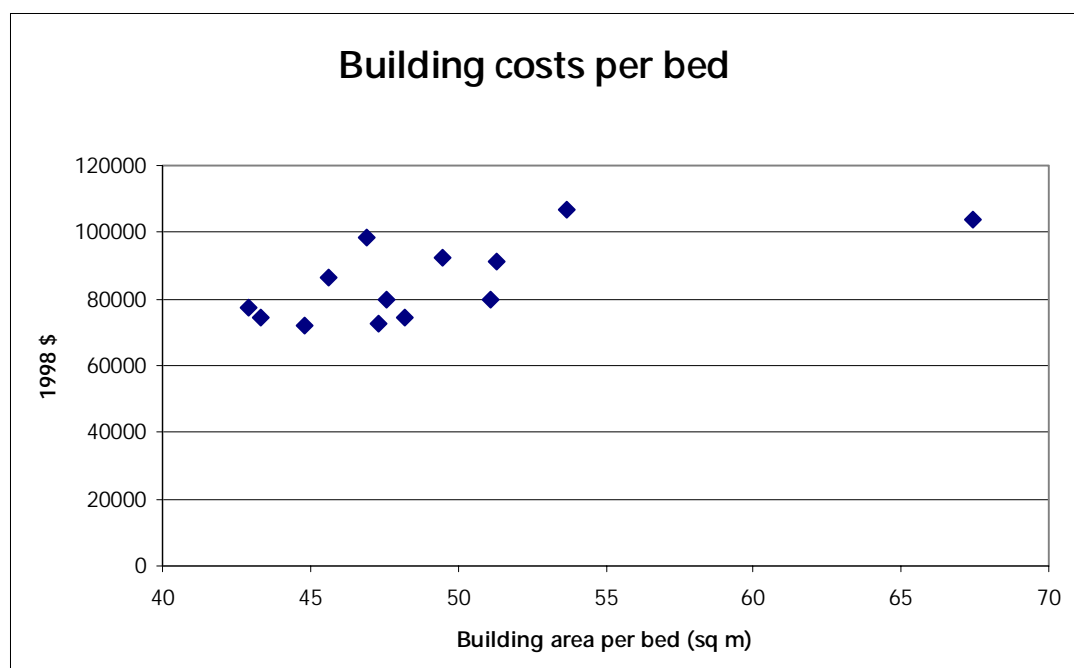
Appendix 4: Sensitivity analysis for funding options

In the following table, Columns (a) and (d) are the rates presented in the paper for Option 1: Pay As You Go and Option 3: Fully Funded.   The other columns show different scenarios for each option.

For Option 1: PAYG, comparison of Column (a) with (b) shows there is no real change if costs and wages move together, while Column (c) shows a 1% increase in costs without a corresponding increase in wages increases the rate from 6.4% to 10.4%, an increase of over 60%, at the 50 year mark.

For Option 3: Fully Funded, comparison of Column (d) with (e) shows that an increase in costs and wages without a change in interest generates an offset against interest earnings and requires an increase in rates to compensate, with the same efect being even more pronounced if there is cost inflation ahead of both wages and interest.

The long term effects are considerably less for the Fully Funded option than for the PAYG option.

	Option 1: Pay As You Go			Option 3: Fully Funded		
	Interest/Wage inflation/Cost Inflation			Interest/Wage inflation/Cost Inflation		
	a	b	c	d	e	f
	-/4/4	-/5/5	-/4/5	8/4/4	8/5/5	8/4/5
2008	2.4	2.4	2.6	4.8	5.2	5.6
2018	2.9	2.9	3.6	3.9	4.3	4.7
2028	4.0	4.0	5.3	3.7	4.1	4.7
2038	5.3	5.3	7.9	3.7	4.1	4.8
2048	6.4	6.4	10.4	3.6	4.1	4.9

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