

# **Economic Issues**

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## **An Ageing Australia: Small Beer or Big Bucks?**

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## **Director's Note**

Welcome to the eleventh issue of *Economic Issues*, a series published by the South Australian Centre for Economic Studies as part of its Corporate Membership Program. The scope of *Economic Issues* is intended to be broad, limited only to topical, applied economic issues of relevance to South Australia and Australia. Within this scope, the intention is to focus on key economic issues — public policy issues, economic trends, economic events — and present an authoritative, expert analysis which contributes to both public understanding and public debate. Papers will be published on a continuing basis, as topics present themselves and as resources allow.

The author of this paper is Gary Banks, Chairman, Productivity Commission. Gary Banks has been Chairman of the Productivity Commission since its inception in April 1998. Previously Executive Commissioner with the Industry Commission, he has headed major reviews on a variety of public policy and regulatory topics. These include public inquiries into research and development, offshore investment, regional adjustment, the gambling industries, regulation of monopoly infrastructure and automotive industry assistance. He most recently headed the Commission's inquiry into the affordability of first home ownership and is currently leading the Commission's new review of National Competition Policy (NCP) and future priorities for reform.

Gary Banks chairs the inter-governmental Review of Government Service Provision and its Working Group on Indigenous Disadvantage. He also oversees the Australian Government's regulation-making processes, through the Office of Regulation Review. Before joining the Commission, Gary worked with the Centre for International Economics, Canberra and has been a consultant to the OECD and World Bank. In earlier years he worked for the GATT Secretariat in Geneva and the Trade Policy Research Centre, London. He studied economics at Monash University and the Australian National University.

An earlier version of this article was presented to Corporate Members at the SA Centre for Economic Studies, Economic Briefing Luncheon held in Adelaide on 29<sup>th</sup> April 2004. The author acknowledges invaluable assistance from Ralph Lattimore and Stuart Wilson, both at the Productivity Commission, in the preparation of this article. We acknowledge the financial support of our Corporate Members and particularly of the Office of Economic Development. It enables the preparation of this *Economic Issues* series.

**Michael O'Neil**  
**Director**  
**SA Centre for Economic Studies**  
**May 2004**



# **An Ageing Australia: Small Beer or Big Bucks?**

## **Overview**

In this Issues Paper Gary Banks argues that ageing does not represent a crisis for Australia. That most Australians live to be old is one of the great successes of modern economies. But ageing will have profound consequences for our economy that will require careful policy responses. This article examines two major strands of these consequences: the supply side generally and health spending — the most important age-sensitive component of government expenditure.

The article employs cohort methods to project age-specific labour force participation rates. These are combined with projections of the age structure to suggest future patterns of labour supply. The fact that older Australians have generally lower labour force participation is the major source of sluggish labour supply growth — with the result that the addition to the labour force in 2002-03 alone is more than the cumulative expected additions over the 18 year period from 2033-34 to 2050-51. When put in per capita terms, these effects are more profound, with hours per capita actually declining by 10 percent from now to 2050-51.

As a corollary of slow labour supply growth, per capita economic growth is likely to stagnate. Per capita GDP growth rates will fall to as low as 1.2 per cent per annum by 2025 — around half the present growth rate. Had there been no ageing, cumulative GDP from 2002-03 to 2050-51 would have been around \$4.8 trillion greater. These ageing effects intensify the importance of productivity growth, which will be the main source of economic growth over the next five decades.

Older people consume more healthcare services per person than others. Ageing pushes more people into these high spending groups, with the likelihood of future increases in costs. The article projects that ageing accounts for an additional \$1.2 trillion in government-funded spending from 2000-01 to 2050-51. However, the dominant influence on health care spending over the next 50 years will still be the inexorable demand for greater health services for all ages, together with continuing technological progress. Overall, we predict that government-funded health costs will rise from 5.8 percent of GDP to 11.1 percent by 2050-51. All jurisdictions face funding pressures and policy challenges. That said, even with ageing, Australia's per capita income in 2050-51 will still be around double that of today, hence these challenges should not be articulated in crisis terms.

## 1. Demography is a powerful force

Demography, the calculus of births and deaths, is becoming a pre-occupation of many OECD countries. Indeed it is becoming a frame of reference for thinking across a range of policy areas — akin to the role of globalisation in policy discussions from the latter part of the 20<sup>th</sup> century. This is certainly the case in Australia, where the Intergenerational Report in 2002 rightly placed population ageing and its economic impacts at centre stage.

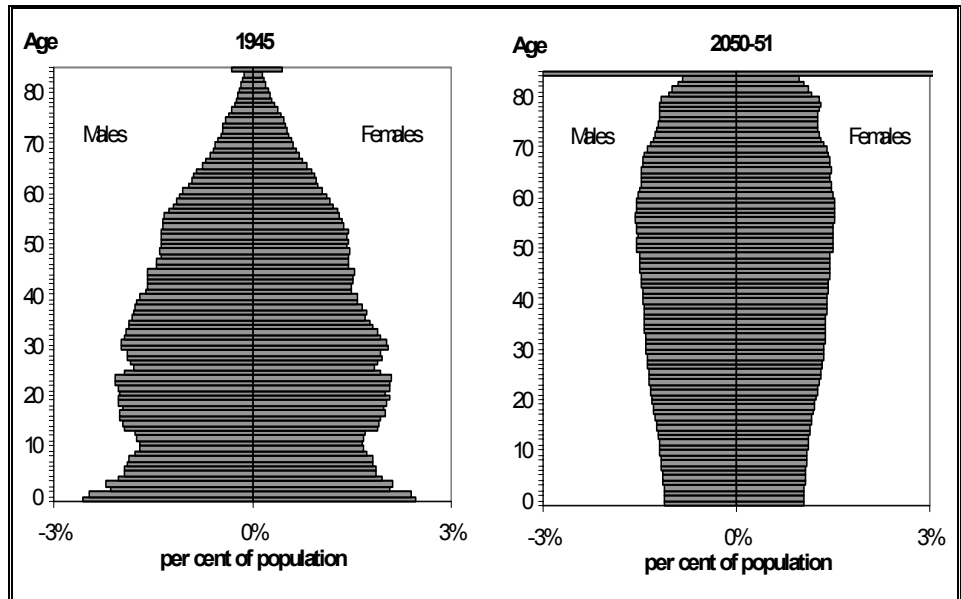
The ostensible ‘problem’ presented by ageing is that 25-30 years from now the middle-aged bulge in Australia’s population — me and many of you — may not be dead. From my perspective, and I suspect yours, this is a matter of some *success!*

Better healthcare, higher incomes and less back-breaking work, mean that today’s average 50 year old can expect to live another 30 years (males) to 34 years (females). Had I been giving this paper a hundred years ago, the comparable expectations would have been a rather more pessimistic 20 to 22 years. And if we go back a thousand years, life was, to borrow Hobbes’ famous description, ‘poor, nasty, brutish and short’ — above all, short. So economic, political and technological developments have made for greater life expectancy and quality of life for people in all the more economically advanced countries.

An ageing Australia is the consequence of the conjunction of this developmental success with a historically large cohort of people born in the few decades after the second world war — the ‘baby boomer’ generation. While the boomers’ parents obviously had lots of babies, the boomers themselves have proved reluctant procreators. Fertility rates are well down — and appear likely to fall further. As a result, between 1945 and 2050, the age structure of the economy will have been transformed from a roughly pyramid-shaped distribution — with a wide base of youngsters — to what has been aptly (and ominously) described as a ‘coffin’ shape (Figure 1 and Macdonald and Kippen 2000).

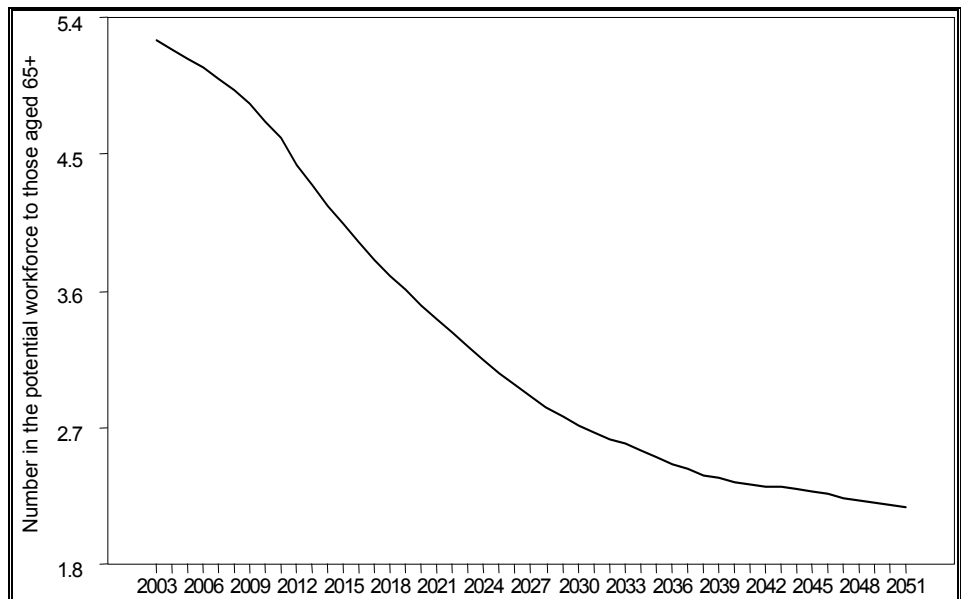
This shift in the age structure means that, over the next fifty years, the ‘aged dependency ratio’ — the number of us aged 65 years and over relative to the population aged 15-64 — will deteriorate significantly (Figure 2). Currently, there are 5.25 people in the (potential) workforce for every person aged 65 or more years. By 2050-51, this will have fallen by more than a half, to 2.2. And the significance of the *very* old is projected to grow even more. At the moment, there are around 290 000 people aged 85 or more in Australia — roughly the size of a small city like Canberra; by 2050-51, the metropolis of the very old will have grown to 1.6 million, or 6 percent of the population.

**Figure 1**  
**From pyramid to coffin – the changing age structure of our population**  
**1945 and 2050-51**



Source: Unpublished data supplied by the ABS.

**Figure 2**  
**The ratio of potential workers to the old will more than halve**



Note: The 'old' are defined as those 65 years and over, while the potential workforce are all those aged 15-64 years.

Source: ABS population projections, series B (Cat. 3222.0).

This ageing pattern is much the same throughout Australia, though more accentuated in some jurisdictions than others (Table 1). South Australia and Tasmania stand out as the states which will have the greatest concentrations of the old by 2050-51. This reflects their present above-average representation and the tendency for migration patterns to predominantly extract the young.

**Table 1**  
**Aged dependency ratios vary across jurisdictions**  
**2002-03 to 2050-51**

	Aged dependency ratio		Very old dependency ratio	
	2002-03	2050-51	2002-03	2050-51
ACT	0.140	0.413	0.017	0.101
NT	0.057	0.179	0.004	0.021
Tasmania	0.218	0.639	0.025	0.156
WA	0.167	0.455	0.018	0.102
SA	0.225	0.556	0.027	0.138
QLD	0.176	0.455	0.020	0.097
VIC	0.196	0.463	0.023	0.105
NSW	0.199	0.456	0.023	0.099
Australia	0.190	0.460	0.022	0.102

Source: As above.

It is often pointed out that there are demographic ‘swings and roundabouts’ — and that the increase in the number of dependent old is counteracted by a decrease in the dependent young. It is true that the ratio of those aged under 15 to the 15-64 year group will fall over the next 50 years. However, this is by nowhere near as much as the aged dependency ratio rises.

In any case, the long-run implications for the economy of the decrease in the dependent young are largely illusory, since the young are the main source of future labour force growth. Falling youth dependency presages low labour force growth and, other things being equal, relatively weak economic growth. That, and the fact that old dependents attract more government spending than the young, suggests that the budgetary impact of the shift between young and old dependency ratios is even greater than suggested by the raw numbers.

Accordingly, demography will be a significant driver of the economy over the ensuing decades. While ageing *per se* is not a problem, it will have consequences that pose genuine policy challenges.

The Productivity Commission has analysed some of the policy-relevant aspects of ageing in past studies (see reference section), but we are set to deepen our interest. Following a decision of the Council of Australian Governments, we will shortly be formally asked to review the economic effects of ageing across Australia. This paper draws heavily on preparatory work for that COAG project.

There is an array of issues and research questions under the rubric of ageing. But today I want to concentrate on two key ones:

- What might happen to Australia’s labour supply as people age, and what are the implications for our economic growth?
- Where might the budgetary shoe pinch and by how much? — with a particular focus on health expenditures.



In doing so, I address some widespread misconceptions and, in particular, reflect on two opposing schools of thought about the economic impacts of our ageing society:

- the *doomsday* view, in which ageing is depicted as a demographic ‘time bomb’; and
- the *Panglossian* perspective, in which ageing scarcely seems to matter at all.

## 2. Where have all the workers gone?

The labour force is like a leaky tub being filled by a hose. Retirement and other moves out of the labour force deplete it, while it is replenished mainly by new younger recruits and women re-entering the workforce after childbirth. The ageing of the population has big effects on these flows.

### *Participation falls with age*

The main measure of labour market engagement is labour ‘participation’ — the ratio of people in the labour force (those *with* jobs and those *looking* for work) to the civilian population aged 15 years and over.

Labour participation falls significantly for those over 55 years and, naturally enough, is negligible after the age of 70. As more people shift into these older groups, leakage out of the labour force quickens and overall labour participation rates fall. This ageing effect is only partly offset by new young workers, since lower past fertility rates have reduced their numbers. It is also partly offset by the continuation of increasing female participation, but this has limits. Getting a good picture of these counteracting flows is hard, yet critical to reasonable projections.

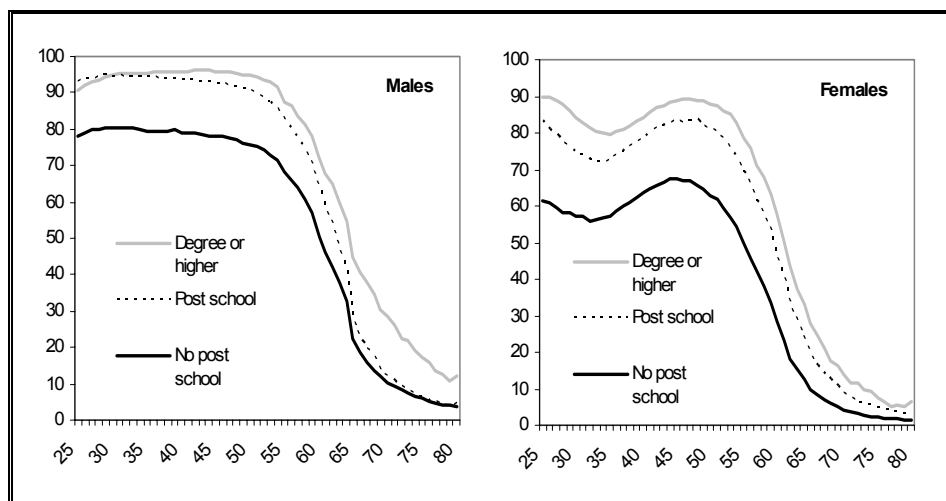
Commission researchers have produced some ‘experimental’ estimates of what will happen to labour participation by considering *cohorts* of people, rather than just looking at age-specific participation rates and how they might evolve. A cohort is a group of people born in a given period. The labour market behaviour of people born in different periods can be quite different, which has implications for future patterns of labour supply. These generational variations may reflect:

- different social attitudes (for example, attitudes to the role of women in the workforce after marriage or childbirth);
- varying aptitudes (due to different levels of education and different lifetime exposures to technology and opportunities for learning by doing); and
- the enduring effects of historical events (such as higher disability rates among combatants in the world wars or the ‘scarring’ effects of mass unemployment).

It is clear, for example, that younger cohorts are on average much better educated than their older brethren, and that better educated people generally have higher participation rates (Figure 3). It is projected that education levels will continue to rise and that, with this, we could expect some increase in participation rates — a point made recently in two research papers from the Australian Treasury (Gruen and Garbutt 2003, Kennedy and Hedley 2003). However, the returns to education may drop off somewhat with its extension to more and more people.

Our research, and that by the ABS (Ravindiran et al. 2002), shows that the generation into which a person is born makes a big difference to his or her future labour force participation. This is particularly so for women.

**Figure 3**  
Labour force participation differs by age and highest educational attainment  
Percentage rates, 2001



Source: ABS Census data 2001 provided by the Australian Treasury.

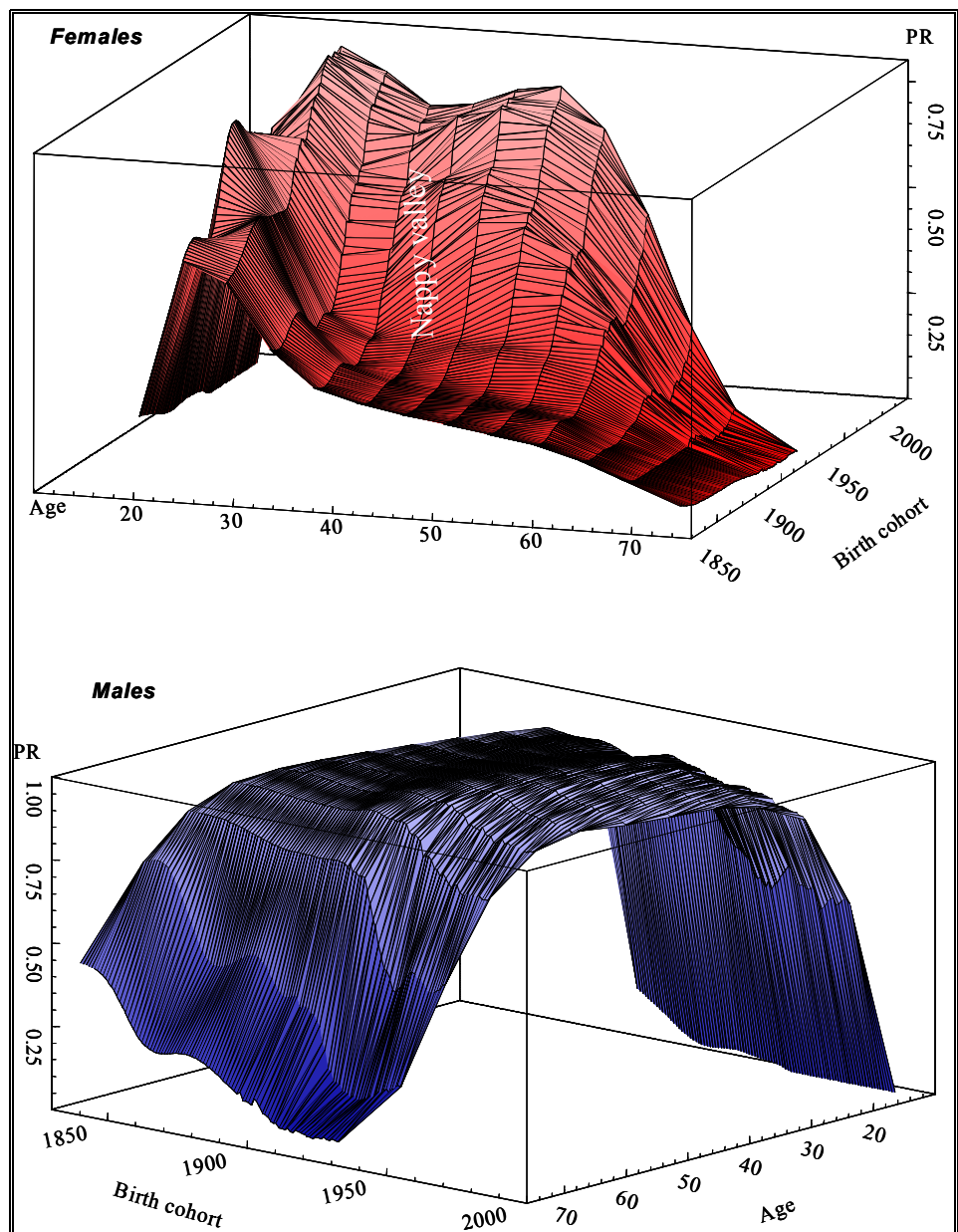
### *Female vs male participation trends*

Lifetime female participation in the labour force has increased dramatically and its time profile has also altered.

- A woman born around Federation would typically participate in the formal labour market while very young (aged 15 to 19 years), and have to withdraw with marriage and child bearing. After having (several) children, she would generally never return to a paid job. The section of Figure 4 depicting participation rates in the childbirth years — ‘nappy valley’ — is wide and deep for such early cohorts.
- A woman born just before the second world war also had her peak participation rate when young, but her withdrawal from the labour market with the advent of childbearing was temporary.

- Later female cohorts have significantly lower participation rates when young, reflecting greater involvement in years 11 and 12 of secondary schooling and tertiary education. But against this, the dip in participation associated with childbearing is smaller and less protracted — ‘nappy valley’ is now shallow and much narrower. This is because women have become better educated, with fewer children and greater access to part-time jobs and childcare. The peak involvement of women in the labour force is now around 40-44 years — in stark contrast to their great-grandmothers.

**Figure 4**  
**Moving mountains: participation rates by age and birth year of cohort**  
 All birth years from 1834-38 to 1988-92



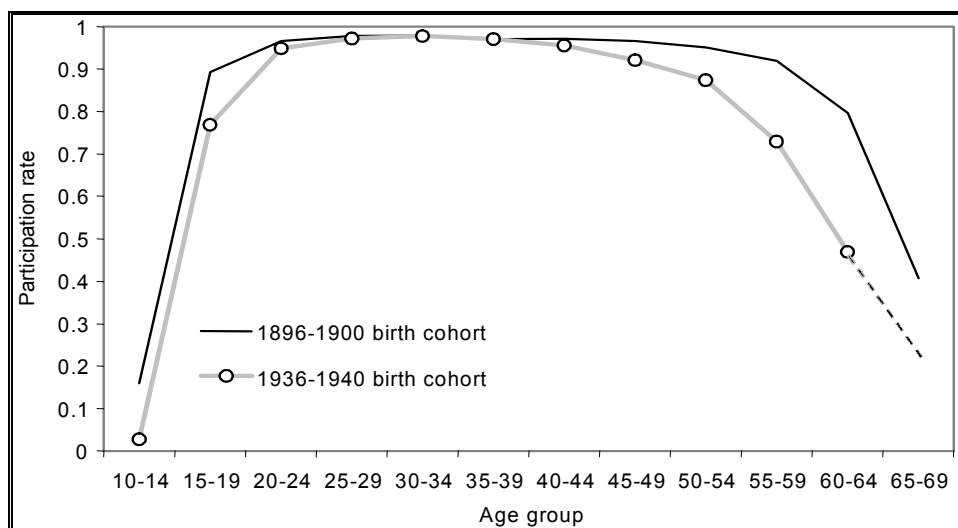
Source: Various labour force series from the ABS and Withers et al. (1985).

Cohort effects are much less pronounced for males than females, and their impact is to *reduce* rather than increase labour force participation.

- At Federation, the lifetime participation profile of males hardly varied between ages 15 and 60 years, with steeply decreasing rates before and after this age range — like a building with a flat roof and steep sides.
- For later cohorts, the roof has started to collapse with older ages (easier seen in a sample of the data — Figure 5). For example, the participation rate of males aged 60-64 years was around 80 per cent for the 1896-1900 birth cohort, but some 30 percentage points less for the 1936-40 birth cohort.

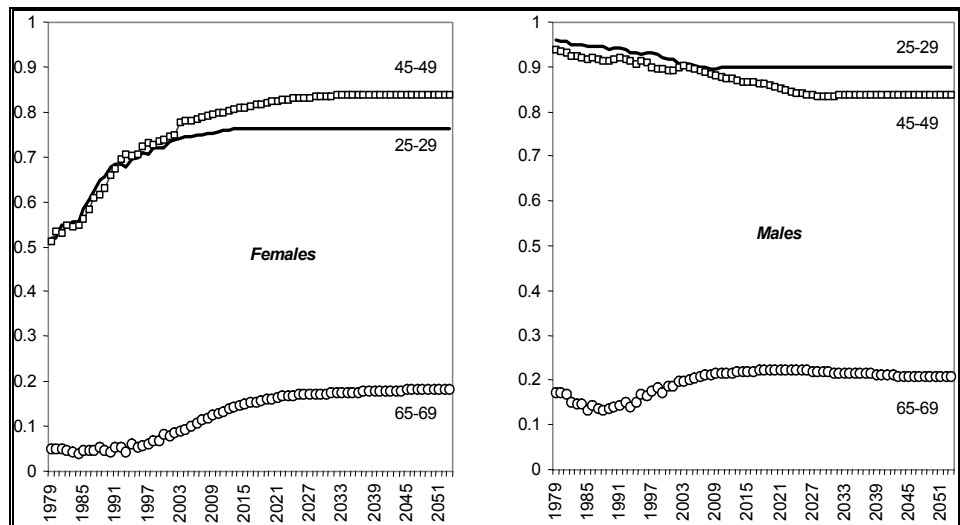
Taking account of these changing cohort patterns, Commission researchers have made some preliminary projections of participation rates for different age groups by gender. (Some sample projections are shown in Figure 6.) The projection method (see Burniaux et al. 2003) assumes that the behaviour of present cohorts, when aged, can be inferred from the *shape* (not the level) of the age-participation profile of earlier cohorts. The projections show a continuing tendency for greater female participation for all ages over 25 years and a (slowly abating) trend for lower male participation by males aged from 25 to 54 years.

**Figure 5**  
**Comparing male participation rates by age for two cohorts**  
**Those born 1896-1900 and those born 1936-1940**



Source: As above.

**Figure 6**  
**Projected participation rates for selected age groups**  
**1978-79 to 2050-51**



Source: Preliminary Commission calculations using the 'dynamic cohort' approach of Burniaux et al. (2003).

### ***Aggregate participation will fall***

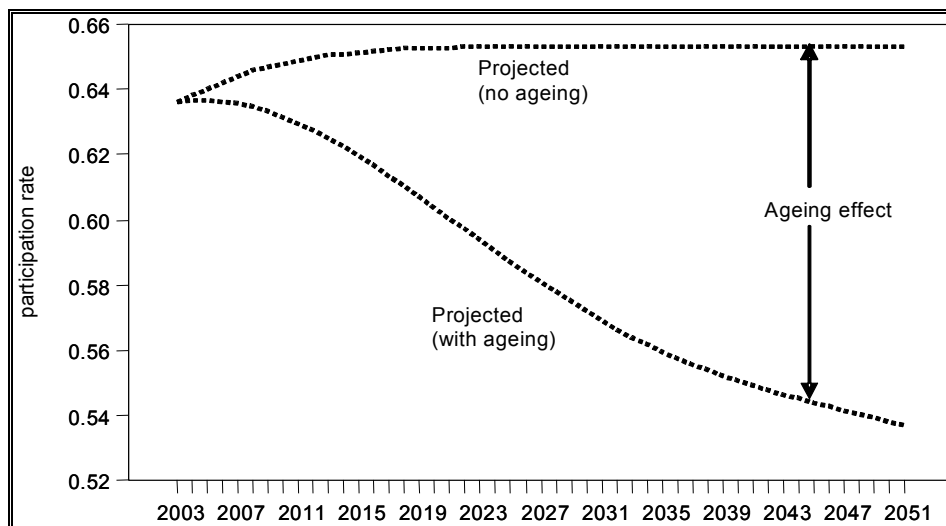
Applying these age-specific trends to our ageing population, aggregate labour force participation rates in Australia are projected to fall by around 10 percentage points from their current level of 64 per cent (Figure 7). Had there been no ageing effect, participation rates would have risen modestly, reflecting the continued importance of rising female participation. (By the way, these projections largely corroborate the findings in the Intergenerational Report, based on older ABS population projections and labour force data, and different methods for forecasting age-specific participation rates.)

But a question remains as to whether the age-specific trends underlying this aggregate forecast are likely to be achieved. It is highly likely that female participation will continue to rise, because the factors that have been driving rising participation are still at work (such as increased education and better matching of female job preferences). But we are less sure of the forecasts of continuing declines in participation trends for prime-aged males, because it is unclear that the historical forces that lowered participation thus far will be sustained.

A major explanation for the historical trend towards lower male participation is the combination of structural change affecting lower-skilled workers in traditional industries (such as manufacturing) and increased access to disability pensions. This has particularly affected mature-aged males. For example, from 1978-79 to 2002-03 there was a quadrupling in the number of males aged 40-49 years claiming the disability pension. If the numbers of males claiming disability pensions were added back into the labour force, the decline in the participation rate for males is much less. (For example, had males aged 60-64 years on a

disability pension stayed in the labour force, participation would have fallen by only 0.4 percentage points since the late 1970s, instead of the actual 8.2 percentage points.)

**Figure 7**  
Aggregate participation rates fall with ageing  
2002-03 to 2050-51



Source: As above.

These trends may not continue. Current policy is increasingly directed at reconnecting at least a proportion of disability pensioners with the labour market. This may halt the downward trend in mature age male participation rates and lead to projections that are different from those in Figures 6 and 7. On the other hand, it is a moot point whether this would substantially alter the trends in *employment* rates by age group (which, as shown below, are what matters for economic growth). This is because many of those on disability payments would have (and have had) great difficulty obtaining jobs.

In any case, even if it is assumed that male participation rates no longer fell after 2002-03, the effect on future aggregate labour force participation rates would be small. Under this assumption, by 2050-51 the aggregate participation rate would be 54.6 per cent instead of the projected 53.7 per cent — underlining the fact that the aggregate changes in the labour force are primarily driven by changing demographics, not trends in participation rates.

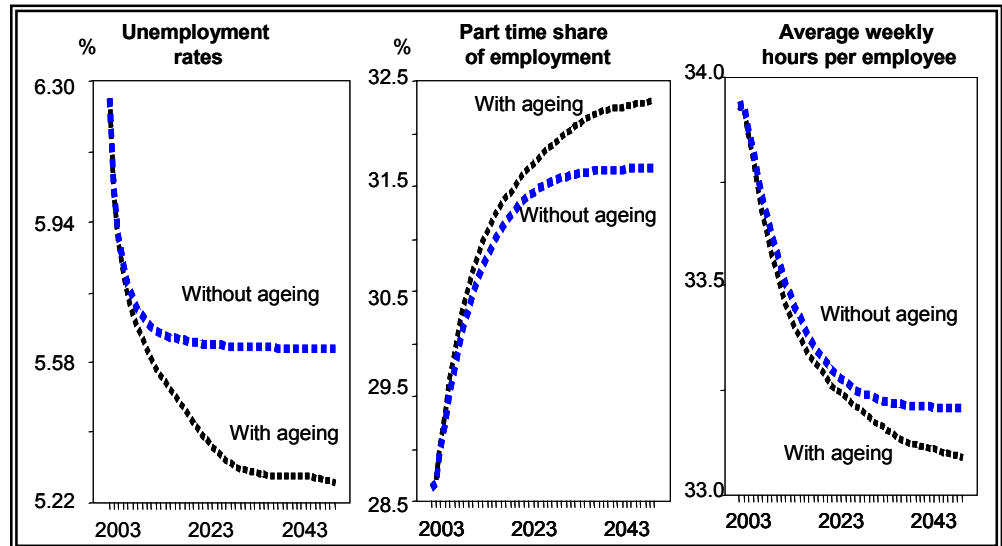
### ***Unemployment falls, but so do hours worked***

Participation is only part of the labour supply story. The other two important elements are unemployment and hours worked.

Ageing has a positive twist for unemployment. This is because the highest unemployment rates are experienced by young people, in the transition from education to work, and the lowest by older people, who

have the alternative of retirement. Consequently, the shift in the age structure of the workforce is likely to lower measured unemployment rates, although the effect is quite small (Figure 8). This effect is reinforced by a generally falling trend in unemployment rates and implies that, for a *given* participation rate, the *effective* labour supply will be higher than otherwise (Figure 8).

**Figure 8**  
Effects of ageing on unemployment, part-time employment rates and average hours worked: 2002-03 to 2050-51



Source: Preliminary Commission calculations.

The story for average hours worked is different again. Average hours worked are generally projected to increase modestly for part-time workers of most ages, while being stable for full-time workers generally. However, the *incidence* of part-time work will continue to rise for Australians of most ages (particularly for males). This is seen as a ‘bad thing’ in some quarters, but it largely reflects the preferences of many people for part-time jobs and the ascendancy of the service sector. That, and the fact that older workers have a much higher tendency to work part-time anyway, mean that average weekly hours per employee are projected to fall.

So ageing has a ‘double whammy’ depressive effect on labour supply — reducing participation rates and cutting average hours worked. These greatly outweigh the positive influences via lowered unemployment.

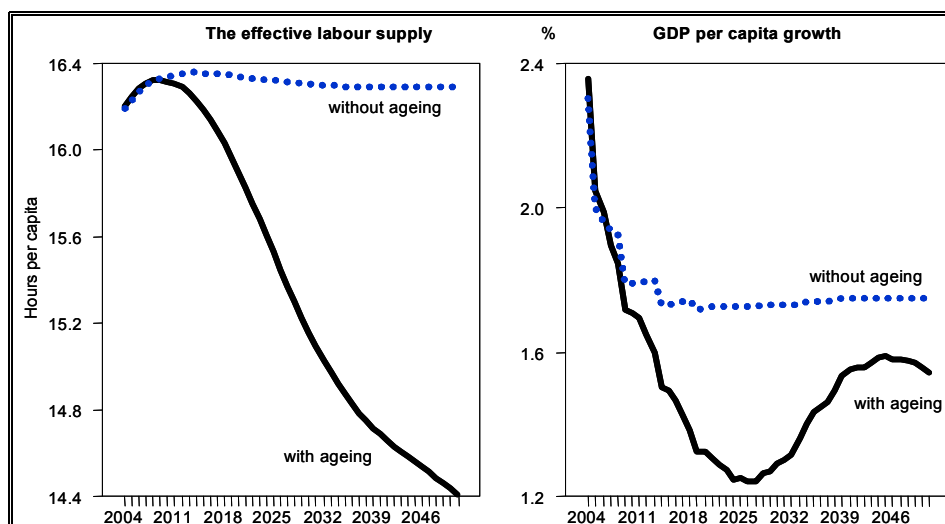
### 3. Ageing and economic growth

These elements of the labour market jigsaw can be assembled to give a picture of the future effective labour supply (measured as total hours of labour used in the economy per capita — Figure 9). Combined with estimates of the future growth in labour productivity (measured as GDP per hour worked), we in turn can get a perspective on how economic growth may fare over the next 50 years.

Population ageing acts as an influential brake on economic growth. Australia's GDP growth rates are projected to fall steadily over the period to around 2025, with a weak recovery thereafter. For example, given an assumed productivity growth rate of 1.75 per cent per annum (as in the Intergenerational Report), GDP per capita growth would slump nearly as low as 1.2 percent a year by the mid 2020s — roughly half its present rate. This is primarily due to the effects of ageing on the size of the labour force. (The additions to the labour force in the past year alone are more than the additions expected over the 18 year period from 2033-34 to 2050-51.)

In the absence of any resurgence in workforce, economic growth over the next four to five decades will overwhelmingly depend on productivity growth.

**Figure 9**  
Economic growth in Australia – a 50 year projection  
2003-04 to 2050-51



Source: Preliminary Commission calculations.

To illustrate its significance, suppose that Australia was able to sustain the so-called ‘miracle’ productivity performance of the 1990s. With an annual productivity growth rate of 2.05 per cent, Australians would be better off in cumulative GDP terms by around \$5 700 billion by 2050-51 relative to the assumed base-case growth rate of 1.75 per cent (Table 2). This equates to an average productivity dividend of just under one quarter of a million dollars per person over this period — a good buffer against the spiralling costs of ageing and trending health spending.<sup>1</sup> This is the power of compound interest.

Of course, the story looks rather worse if Australia were to record the average productivity growth rate that prevailed in the two decades prior to the ‘miracle’ years (1.62 per cent per year). In that case, by 2050-51 Australia would be cumulatively worse off relative to the base case by around \$2 300 billion, *adding* to the difficulties in meeting any financing costs associated with ageing.



**Table 2**  
**The GDP effects of different productivity growth scenarios**

	2.05% pa after 2002-03	1.75% pa after 2002-03	1.62% pa after 2002-03
<i>Average growth in GDP per capita</i>	%	%	%
1990s	2.15	2.15	2.15
2000s	2.06	1.85	1.76
2010s	1.79	1.49	1.36
2020s	1.57	1.27	1.14
2030s	1.73	1.43	1.30
2040s	1.87	1.57	1.44
Real GDP per capita in 2050-51 (\$)	\$88 073	\$76 467	\$71 915
Increase over real GDP per capita in 2003-04 (\$)	\$50 899	\$39 293	\$34 741
Additional real GDP 2003-04 to 2050-51 (\$ billion)	\$5 651	..	-\$2 279

Note: GDP is in 2001-02 prices.

Source: Preliminary Commission calculations.

### ***The labour ‘problem’ in historical perspective***

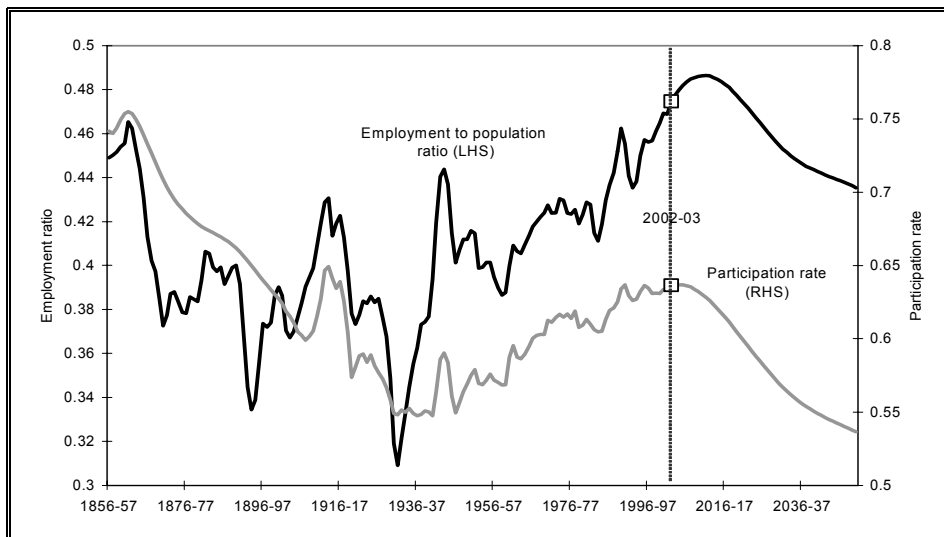
Under each productivity scenario, per capita GDP in 2050-51 will be significantly less than if there were no ageing-population effect. (For example, with a productivity growth rate of 1.75 per cent, GDP per capita without ageing is around \$10,000 or 13 per cent more by 2050-51 than with ageing. Ageing creates a \$4,800 billion dent in cumulative national output from 2003-04 to 2050-51.) This reflects the importance of the demographics working through labour force participation — which is on course to reach its lowest level since records began in the 1850s (Figure 10).

But adopting a long historical perspective also reveals a more positive story. For one thing, it becomes apparent that labour force participation today is at its highest rate since just before World War I. Secondly, if we look at the proportion of the total population in employment, this is the highest it has ‘ever’ been (Figure 10). Even with the projected decline in participation, the ratio of employees to population will still be higher in 2050 than at almost any time in the period since the Great Depression. (This reflects the importance of the young population in this ratio.)

While the future decline in the employment-to-population ratio is attributable to the baby boomer syndrome, so too has been its rise and current apex — which reflects the work contributions of adult baby-boomers and their relative lack of progeny. The baby boomer phenomenon produced a big economic growth bulge, which will inevitably vanish as the boomers age. In this sense, the demographic transition is like the hangover after a good party. Of course, the fact that one has had a good party does not make the hangover any less painful, or eliminate the need to plan for its effects. But it makes it clear that it is

misplaced to *blame* ageing for any economic pains, since the flip side of that very phenomenon was an earlier era of economic gains.

**Figure 10**  
**Taking a long view: 200 years of Australian labour supply**  
**1856-57 to 2050-51**



Note: These data were constructed from many historical data series – with interpolation based on econometric estimates and cubic splines for some earlier data.

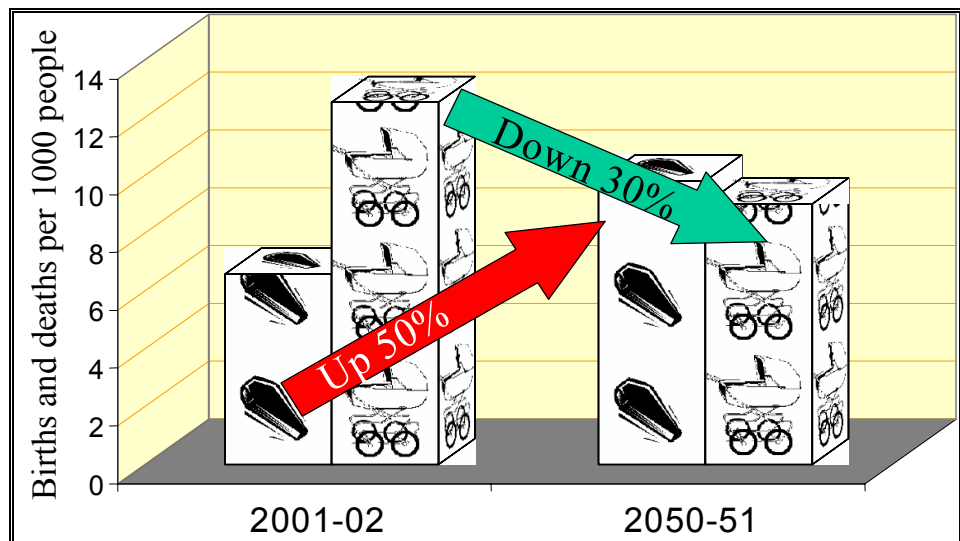
Source: Commission estimates based on ABS labour force data, Vamplew (1987), Withers et al. (1985), and Foster and Stewart (1991).

#### 4. What budgetary implications?

Economies are pretty robust — many aspects of an ageing Australia will be accommodated automatically by the market. Consumption and production patterns will shift towards goods and services that best meet the preferences and needs of the old. On a positive personal note, there will be more Bach and less Beyonce; on a negative one, more coffins and less prams (Figure 11). But the point is that these transitions in consumption and production will be achieved fairly smoothly as resources progressively move around in response to the opportunities associated with the new demographic structure.

Nevertheless, some critical age-related goods and services are *not* provided through market forces, but by governments. These include a substantial share of health and aged care, as well as government-funded pensions. As we have seen, GDP — the pie from which such services are ultimately funded — is projected to grow more slowly than the spending demands.

**Figure 11**  
Market outlook for coffins and prams<sup>a</sup>



Note: <sup>a</sup> Assumes that demand is proportional to births and deaths.  
Source: Unpublished data from ABS population projections, series B.

In one area, aged pensions, Australia is relatively well placed compared to most developed countries. Standard & Poor's, the credit rating agency, has recently warned that in many advanced countries, the damage caused to public finances by demographic-related expenditures, particularly government pensions, risks a blow-out in public debt. It predicts credit down-grading for most. But Australia emerges relatively untouched, because of past pension reforms.

As Prof. Paul Johnson from the UK put it a few years ago, when addressing the (seminal) conference on ageing and public policy that the Productivity Commission co-hosted with the Melbourne Institute:

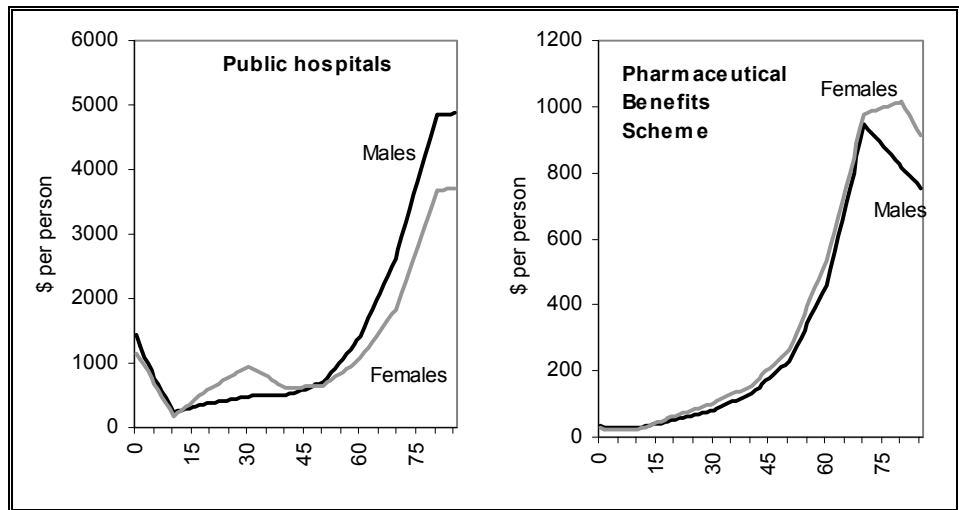
Australia has managed, either by historical accident or brilliant foresight, to avoid the most pressing public pension finance problems faced by many OECD countries (1999, p.23)

## 5. Health care costs rise steeply for older Australians

But what of *healthcare* expenditure? Currently, older people consume more health services per person than other Australians. For example:

- Costs per person in the Pharmaceutical Benefits Scheme are strongly age-related — average costs for a male aged 65-74 are more than 18 times those for a male aged 15-24 (Figure 12).
- Hospital costs follow a similarly steep age-profile, while Medicare costs also rise with age, though less steeply.

**Figure 12**  
Costs of hospitals and drugs rise with age

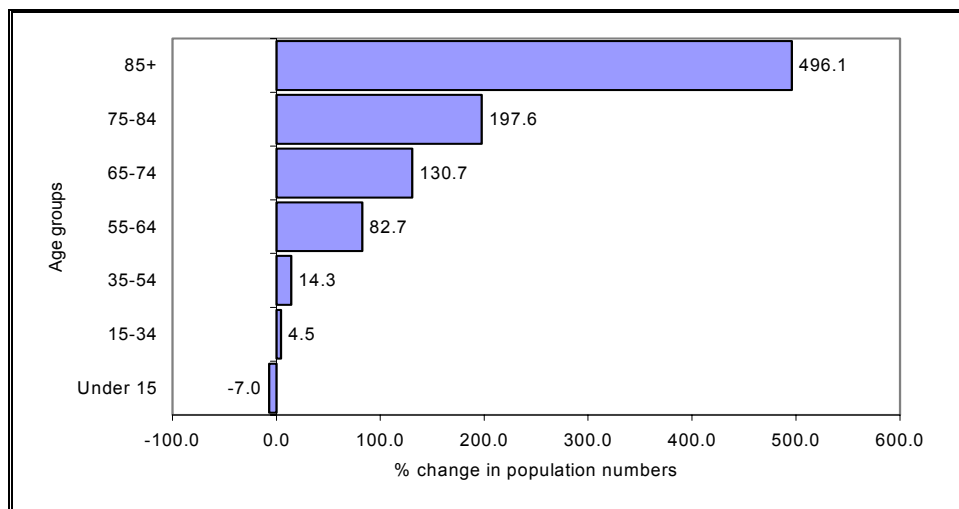


Source: PBS Data provided by the Health Insurance Commission for 2002-03; Hospital data are re-based data from 1993-94 from Mathers et al. (1998).

Across health services as a whole, expenditure on the over 65s amounts to around 4 times more per person than that on those under 65, and rises to between 6 to 9 times more for the oldest groups. Similarly strong age-based relationships are observable across time and in all developed countries.

With rapidly increasing numbers of the old (Figure 13), the upward-sloping age profile of health expenditure suggests that ageing will increase health spending significantly. That, however, is not the end of the health expenditure story. Other factors are also at work.

**Figure 13**  
The greying of Australia  
Growth rates in population numbers by age group, 2000-01 to 2050-51<sup>a</sup>



Source: Based on ABS population projections series B (Cat. 3222.0).

## **6. The interaction of demand and technology**

In fact, the major drivers of rising healthcare costs per capita in advanced economies will (continue to) be the inexorable demand for greater health services, together with the emergence and diffusion of new medical technologies.

The importance of strong demand effects is not surprising. Rising incomes simultaneously fuel the capacity for increased government funding of health care, create expectations of better and more extensive treatments and prompt investments in new health technologies. While some of these technologies lower the cost of care (eg cataract operations), overall the expansion of treatment is generally considered to have outweighed any unit cost reductions. (While this may be a negative in expenditure terms, to a large extent it reflects the positive success of modern medicine in improving and prolonging peoples' lives.)

These demand and technology developments are sometimes perceived as being 'ageing-neutral', because rising trends in expenditure per person occur for all ages. However, this ignores some important facets to the influence of rising demand.

- First, if older people use more health services, then ageing and demand/technology effects interact to produce greater costs. To give a (contrived) example, suppose that at a given time, costs for each young person were \$100 a year, while costs for each old person were \$1000 a year, and that demand pressures would lead to a trebling of costs for all ages. Assume for simplicity that there is no population growth. In one world, 95 per cent of the population is young and structure holds true over time, whereas in a parallel world, 95 per cent of the population is young initially, but this proportion falls to 50 per cent over time. Average costs per capita would rise threefold in the world with the static age structure, but by more than 11 times in the ageing world. Age and demand factors form a potent cocktail.
- Second, there is increasing evidence that growth rates in health care spending are greater for older than younger people; in part, based on appropriate changes in societal perceptions of the value of older people (Box 1). For example, average annual growth in hospital treatment (separations per person) have grown much more for the old than the young (Figure 14). DoHA (2003) attributes most of this increase to greater use of private hospital services, particularly in the areas of same day admissions for renal dialysis, cataract-related eye surgery, colonoscopies, etc.

In the United States, a leading health economist (Fuchs 1998) — ironically, also previously the foremost academic sceptic of the view that ageing mattered much to health expenditure — argues that rising health costs, particularly those associated with technological developments directed at ongoing health care needs of the old, pose severe risks:

The tendency of health care expenditures on the elderly to grow about 4 per cent per annum more rapidly than the Gross Domestic Product could plunge the nation into a severe economic and social crisis within two decades.

That is likely to be too extreme a judgment for Australia, but it does underline the importance of determining how the age profile of health costs rises over time.

**Box 1**

**Changing attitudes to treatment for the aged**

In a recent study, DoHA (2003) reported the following comments on the interaction between community expectations, demand and ageing.

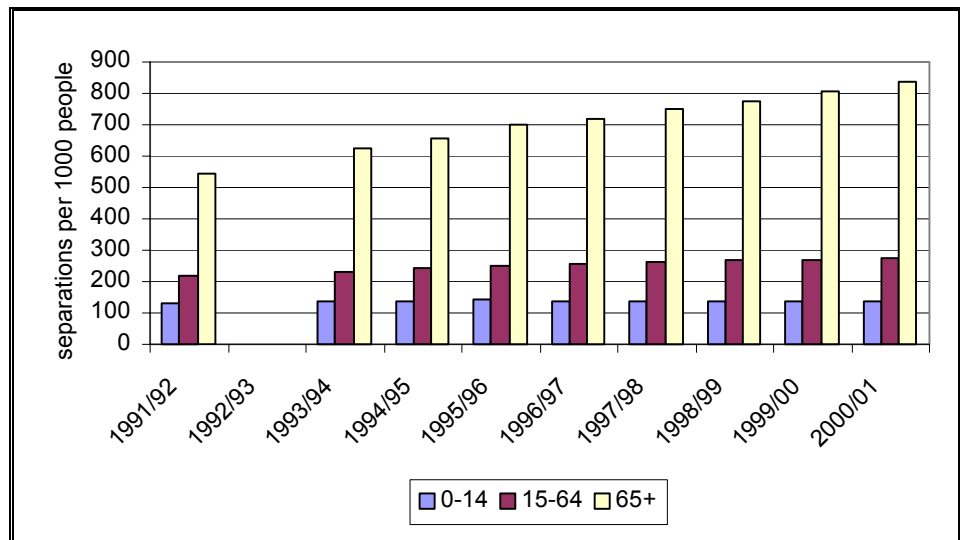
I think there is, for the very old and frail, a change in community expectations of what medical care is appropriate for those people, and that is responded to. In the past, when pneumonia, the old man's friend, came to visit, that was regarded as quite a good outcome. That is not acceptable to the community anymore. There is a greater tendency to do significant interventions in the really old...(Evidence of Professor D. Cameron, President, Royal Australasian College of Physicians, SCARCPHF, Committee Hansard, 21 March 2000, p. 379).

People are being offered treatments and operations that were not available 10 years ago. Older people are able to undergo operations and procedures that previously were denied to them. For example, 10 years ago 75-year-old people often were not dialysed if they had chronic renal failure, but this would be a common occurrence now (Evidence of Dr P. Davoren, President, Doctors Reform Society, SCARCPHF, Committee Hansard, 22 March 2000, p. 402).

When I was in an intensive care unit 20 years ago, somebody over 75 would have a tough time getting in. They are now 85 and they are having complicated and major surgery ... I do not see politicians suddenly saying, 'Let's go back and we will not take anybody over 75 into intensive care units'. So the demand is going to increase (Evidence of Ms B. Morieson, Secretary, Victorian Branch, Australian Nursing Federation, SCARCPHF, Committee Hansard, 23 March 2000, p. 533).

Source: DoHA 2003 (Trends in hospital activity: Australia 1991-92 to 2000-01, Occ paper New series 15)

**Figure 14**  
**Trends in hospital separations per 1,000 people, by age group**  
**1991-92 to 2000-01**



Source: Data source: DOHA 2003, ABS population estimates (cat. 3201.0).

## 7. Two contrary views about ageing and health

While historical evidence suggests that age-cost profiles *will* rise over time, amplifying ageing population effects, some analysts have argued that ageing itself will be a relatively insignificant source of pressure in the health system (for example, Sheehan 2002, Jacobzone 2003 and Richardson and Roberston 1999). They point to two phenomenon that could greatly moderate its costs — reduced future disability rates, and the distinction between the costs of dying and ongoing care.<sup>3</sup>

### *Trends in disability: older longer or just older later?*

One hypothesis is that increased life expectancy and lower age-specific disability levels will negate the influence of ageing on health costs. From this perspective, a larger but healthier aged population in the future may not make a significantly greater call on funds than the existing elderly cohort. Such a view relies on two premises:

- that disability rates are declining; and
- that lower disability rates imply lower medical costs.

Notwithstanding rather mixed data for Australia, the most compelling international evidence favours the view that age-specific disability rates *are* falling (Cutler, 2001; Manton and Gu 2001). The gains reflect a wide range of influences, including improved medical treatments, better medication and behavioural changes (notably reduction in cigarette smoking).

Less disability should translate directly to lower institutionalisation rates for aged care and lower participation rates in home care programs than otherwise (although the number of people requiring care is still projected to increase because of the much greater share of older people in the population).

However, it is not clear that lower disability levels necessarily mean lower age-specific health expenditures. Depending on the reason for the reduction in disability, health expenditure could either increase or decrease. If lifestyle changes, such as reduced smoking, or better (low cost) medical care, prevent people developing conditions that disable them, then lower disability would obviously be associated with lower expenditure. But, if treatment with increasingly expensive technologies allows people to manage their conditions so that they are not disabling, then lower disability will involve costly medical investments.

While the evidence goes both ways, our initial reading is that costly medical interventions have played a major role in reducing disability associated with underlying medical conditions. For example, in a recent survey article, Jacobzone (2003) concludes that ‘declines in disability may, in fact, be very costly to achieve in terms of health care’.

But even if we are wrong on this point, and lower age-specific disability rates could be achieved at no cost to health expenditure, the overall story for projected health care costs is likely to change very little. This reflects the fact that:

- the actual cost of care per person for older groups will still be much higher than for younger groups, even if lower disability rates make older people healthier than before; together with
- the greatly increased numbers of the old with the ageing of the baby boomers.

***Are the costs of dying, not age, the real driver of health spending?***

A related argument sometimes offered for why more old people may not significantly increase health expenditure, is that spending is not related to age *per se*, but to the period just before death. If health expenditure is particularly large only in say the last year of life, there will be a strong observed link between health care expenditures and age in cross-sections of the population because the proportion of people near death increases with age (Fuchs 1984, p.152). But this pattern may not hold over time. As age-specific death rates fall over time, there will be fewer people in the last year of life, and this will tend to reduce age-specific health expenditures. Based on research for Switzerland, one influential health economist, Zwiefel et al. (1999) found that

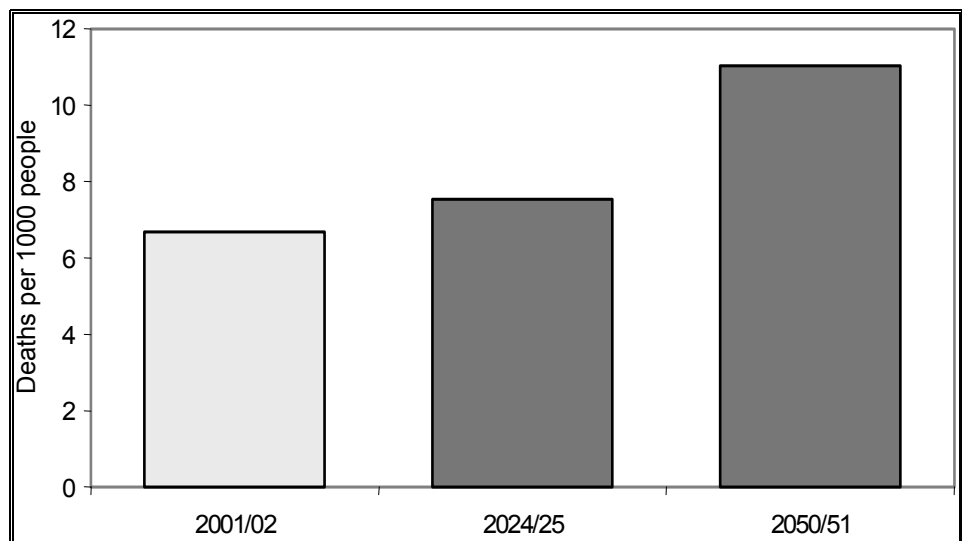


...the terminal phase of life is costly independently of whether it occurs at age 60 or 90. Consequently, per capita health care expenditure is not necessarily affected by the ageing of the population due to an increase in life expectancy.

As yet, the importance of this phenomenon is unclear, but there are reasons for policy caution:

- First, although the available evidence suggests that health costs *are* high at the end of life, it also shows that they increase with age for people not close to death (Hoover 2002). And, as noted, there is evidence that medical technology has allowed the management of many (non-fatal) chronic conditions leading to less disability (Jacobzone 2003). More information is needed, especially in an Australian context.
- Second, even if the ‘proximity effect’ holds, it need not mean that the additional costs associated with an ageing population will be small. The adage that ‘young men may die, old men must’ applies — the old necessarily have much higher mortality rates. Combined with the emerging bulge towards later years in Australia’s age structure, this implies *significantly increasing numbers of deaths relative to the total population*. Indeed, the number of deaths per 1000 people is expected to rise by around 65 per cent between now and 2050-51, even allowing for projected increases in life expectancy (Figure 15). At best, the phenomenon of costs predominating close to death can *postpone* rising health costs associated with an ageing population — it does not eliminate them.

**Figure 15**  
Projected deaths per 1,000 persons



Source: ABS series B projections, ABS age specific mortality rates, Commission estimates.

### 8. Projecting Australia’s health costs

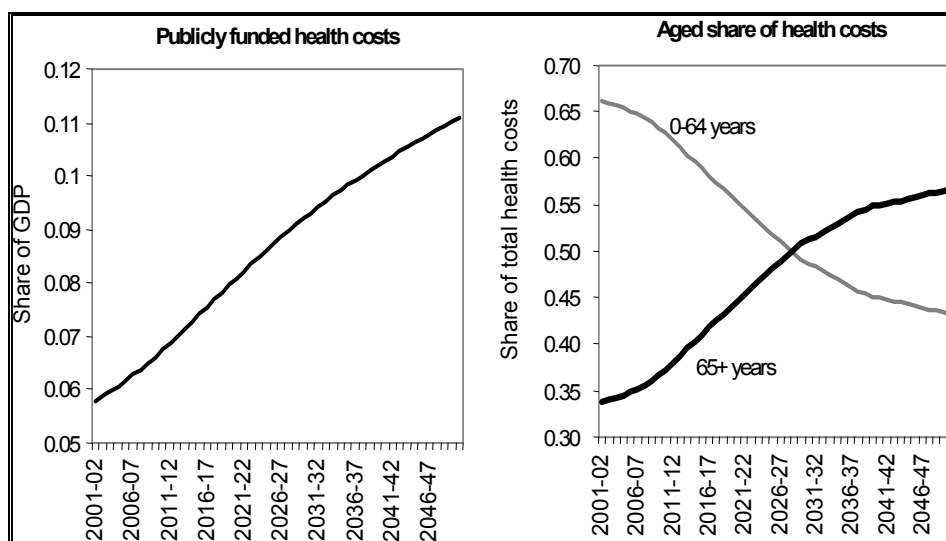
It is apparent that the effects of an ageing population on healthcare expenditure is a complex process with many uncertainties. Even so, simple forecasts that rely on projected populations and an age profile of costs that shifts out proportionately with higher demand (so-called ‘needs-based’ models) capture the essence of the relationship between demographic and non-demographic factors. Such models have been used in the Intergenerational Report and by others. They are also the primary basis on which the Commission has been constructing its own preliminary projections. (We have considered variant models that incorporate credible assumptions about costs close to death and the notion of people living ‘healthier longer’ — but the results are not qualitatively different).

There are four major categories of health expenditure — hospital, medical services (Medicare), pharmaceutical and other expenditure — each of which needs to be projected separately and aggregated to estimate total government expenditure. We have also made separate preliminary projections of State and Territory Government health spending. The data required to project each component of health expenditure are:

- the age profile of expenditure for each component;
- projected growth and change in the age composition of Australia’s population; and
- the change in each components’ per capita costs for each age group.

Using this approach, and what we think are some credible assumptions, overall health care spending by all Australian governments (excluding aged care and capital consumption) are found to increase from 5.8 per cent of GDP in 2000-01 to 11.1 per cent — almost double — by 2050-51 (Figure 16).

**Figure 16**  
**What happens to government-funded health expenditure?**

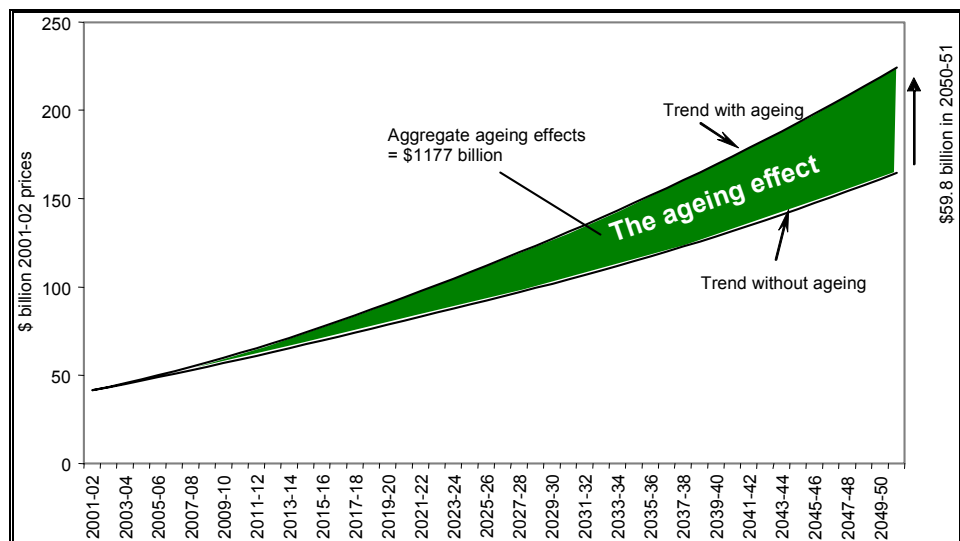


Source: Preliminary Commission estimates.

As might be expected from the shift in the age structure over this period, the relative importance of the old as users of government-funded health care changes significantly. Presently, those over 65 account for about one-third of total government funded health care, but by 2050-51, they account for *well over half the health budget*.

Of course, as noted, not all of the increase in health care expenditure arises from ageing alone. There are several ways of understanding the separate effects of ageing on the health budget. Perhaps the most helpful is to ask: what would have happened to health expenditure if the non-age related demand/technology pressures and population changes were still in play, but we could preserve the age structure at its 2000-01 level? The separate effects of ageing relative to this imaginary ‘forever young’ world are found to be still substantial, leading to health costs in 2050-51 that are about one-third higher (Figure 17). That amounts to around \$60 billion in just that year. Over the entire period to 2050-51, ageing of the population accounts for an additional \$1.2 trillion in government-funded spending.

**Figure 17**  
**How big is the ageing effect for health care costs?**  
**2001-02 to 2050-51**



Source: Preliminary Commission estimates.

The effects of population ageing vary across the different components of health care. They are profound in hospitals and pharmaceuticals, because these services have cost profiles that rise most steeply with age (Table 3). Pharmaceuticals is also a major source of pressure on the Commonwealth budget because of its non-demographic cost drivers (technology and income). However, in the Commission’s preliminary analysis, the impact of pharmaceuticals is less than in the Intergenerational Report, because a lower long-run growth rate was applied over the end of the forecast horizon. (Assuming a perennial growth rate well above other cost components has unrealistic long-run consequences. First, the cost component approaches 100 per cent of total health costs in the long run.

Moreover, in the very long term, these health costs would begin to dominate Australia's GDP. Even if it was thought that pharmaceutical expenditure might continue to rise at high rates for some years, it seems unlikely that this would be permitted by government unless it produced dividends elsewhere in the health system — say through lowered hospital costs.)

**Table 3**  
**Where are the biggest cost pressures in health?**

Area of health	Share of GDP		Increase in 2050-51 due to ageing
	2001-02	2050-51	
	%	%	%
Hospital	2.71	5.00	45.3
Medicare	1.27	1.93	19.7
Pharmaceutical Benefits Scheme	0.68	2.52	52.1
Other Expenditure	1.14	1.67	15.4
Total	5.79	11.12	36.4

Source: Preliminary Commission calculations.

All jurisdictions have health funding responsibilities, and our preliminary analysis suggests that each of them will also experience funding pressures over the next fifty years.

- Overall, the costs of state and territory funded healthcare rise from around 1.9 percent of GDP in 2001-02 to 3.34 percent of GDP by 2050-51.
- Even so, reflecting the magnitude of its contribution through the PBS and funding for public hospitals, the Australian Government is estimated to account for over 3.9 percentage points of the 5.3 percentage points increase in health costs as a share of GDP over this period.

It is also apparent that some states and territories face greater pressures than others. Our preliminary estimates for South Australia, for example, suggest that health costs will rise from under 2.4 percent of gross state product in 2001-02 to around 4.14 percent by 2050-51 — a greater increase than projected for the eastern states. Tasmania, with an even more rapidly ageing population, could see its health care costs rise from 2.84 percent to 5.08 percent of GSP over the same period.

## 9. Some 'health warnings' on projections

It is customary to hide warnings to consumers in fine print. I want to *highlight* my warnings about these projections. For one thing, they are based on preliminary work that has yet to be publicly tested. But they are likely to be wrong in any case. Indeed, such projections are *presumed* not to be met, because (hopefully) they elicit policy and behavioural

responses that deal with the adverse consequences they reveal. The projections could be right only if we chose to do nothing.

Moreover, even assuming that existing policy settings were maintained, there are many other things impacting on the future — especially over a 50 year horizon — that are unguessable or very uncertain. For instance, effective treatments for Alzheimer’s disease could emerge which would free many from residential nursing homes. Fertility rates may not drop as much as forecast. (Trend analysis prior to the baby boom would have missed that phenomenon.) Or more people may work on into later ages in the future than anticipated.

But even with all the uncertainties, there are good reasons for intelligent prognostication, provided that projections are updated as new information becomes available.

## 10. Some policy implications

### *“Don’t panic!! Don’t panic!!”*

One doesn’t have to be Panglossian to believe, as many Australian commentators clearly do, that the impacts of our ageing population do not constitute a crisis. From many perspectives, their rejection of hyperbole is correct:

- Australia will be a much richer country when the impacts are felt, and so will have the collective resources to deal with its costs.
- Compared to many OECD countries, Australia has relatively low future government commitments to fund aged pensions.
- People contribute to society in ways other than just through their ‘marketplace labour’. Older Australians play a significant role as volunteers, carers and community members, even if these don’t enter GDP estimates.
- Increased spending on health yields benefits. It promotes higher quality living as well as longevity (and in some cases avoids tangible costs, such as residential care).

While one can dismiss the view that ageing of society represents a crisis, at least in the Australian context, it is important not to underplay the policy challenges that it poses. This reflects the reality that governments are responsible for many of the costs that are strongly age-related (such as health) and will have to respond to the budgetary consequences as these costs rise relative to (tax) income.

The challenges posed by ageing are not immediate. But their long-run scale invites the use of policy measures over long time-frames, in order to avoid the need for inefficient or inequitable ‘big bang’ interventions — such as excessive tax hikes or service rationing.

The imperative for timely intervention is receiving increasing recognition. Exercises such as the Intergenerational Report and the Hogan Report into aged care, and earlier policy initiatives in superannuation and pension reform, explicitly recognise the advantages of appropriately phased pre-emptive policies — as does COAG’s request for further research by the Productivity Commission.

The directions for policy attention can be divided into those that promote growth and those that improve the cost-effectiveness of health (and other government-funded) services that people need. On the growth side, two key drivers are labour supply and productivity.

### ***Can we lift labour force participation?***

Australians relish their retirement (who doesn’t?) — so there are obvious limits to increasing participation among older people, at least for those over 65. However, labour force participation rates among Australians aged 55-64 are low relative to other age groups and by OECD standards. Indeed, participation rates for Australian men and women are lower than the 80<sup>th</sup> percentile for comparable OECD countries for *all* age groups older than 25 years (Gruen and Garbutt 2003). Were Australian age-specific participation rates to converge on the 80<sup>th</sup> percentile OECD rate for each age group over the next 20 years, they would lift them well above our baseline projections and would substantially offset the economic growth impacts of ageing.

Of course, GDP growth *per se* is too narrow a policy criterion in this area, given the value Australians place on engagement in non-market work, volunteering and leisure. We might not wish to make the policy changes needed to engineer an 80<sup>th</sup> percentile OECD participation score.

That said, policy measures and cultural changes that address artificial incentives to retire or remain outside the workforce, allow better job prospects for discouraged mature age Australians and that facilitate age and family-friendly workplaces could well increase participation rates above those we have projected. This is an important area for policy consideration (see Henry, 2003).

### ***The productivity imperative remains***

We have shown that a small improvement in annual productivity can compound to a large GDP and income dividend.

Some have argued that the IGR’s assumption of 1.75 per cent is too pessimistic, given Australia’s performance since the early 1990s. But the ‘miracle’ performance of the 1990s involved an element of catch-up which, by definition, is a once-off phenomenon. A productivity growth rate of 1.75 per cent is already above the average for preceding decades.

Arguably that is justified on the basis of improved ongoing incentives and capacity for industry to perform. But to raise long-term productivity growth beyond that rate, and thereby provide additional resources to fund higher intergenerational expenditure, there will be a need for policies that not only continue to enhance the efficiency and flexibility of our economy, but also raise further our capacity for innovation (through building human capital and greater technological diffusion, among other things).

### *Cost-effective service delivery counts too*

A key area where productivity improvements can help is in the ageing-affected government-funded services themselves, such as health and aged care. The ‘Blue Book’ — produced each year by the intergovernmental Review of Government Service Provision — reveals apparent disparities in efficiency across jurisdictions in a range of services. This indicates scope for governments to learn from each other in developing more cost-effective service delivery. But there may also be issues in common that need to be addressed. For example:

- Coordination between different types of services, different types of providers and levels of government remains an important focus for efficient delivery (for example, avoiding cost-shifting incentives).
- The healthcare labour market is characterised by a range of inflexible professional demarcation rules that determine who can do what for whom. While some of these are appropriate, others may become increasingly redundant with new technologies and better training for health care workers.
- The costly impact of preventable health problems (for example, associated with obesity and smoking) raises the role of public health promotion.
- Pricing signals in healthcare remain appropriately muted, given the importance of having wide community access to such services. However, their practical application can create excessive demand in some parts of the health system and deficient demand in others. The challenge is to ensure the ‘right’ quantum of resources in the health and aged care sector and their allocation in a way that best meets patients’ preferences and needs. We need to avoid the twin perils of overconsumption and rationing.

## **11. Bottom line**

In sum, the Commission’s preliminary analysis and projections show no cause for panic, but nor do they provide any excuse for complacency. All the indications are that the demographic transition will have profound effects on our society and economy that will require judicious planning and timely intervention by all levels of government.

## References

- Barnes, P., Johnson, R., Kulys, A. and Hook, S. 1999, Productivity and the Structure of Employment, Productivity Commission Staff Research Paper, AusInfo, Canberra, July.
- Burniaux, J., Duval, R. and Jaumotte, F. 2003, Coping with ageing: A dynamic approach to quantify the impact of alternative policy options on future labour supply in OECD countries, Economic Department Working Papers No. 371, OECD, Paris.
- Costello, The Hon. P. 2002, *Intergenerational Report 2002-03*, Budget Paper No. 5, 14 May 2002, Canberra.
- Cutler, D. 2001, 'The reduction in disability among the elderly', Proceedings of the National Academy of Science, Vol. 98, No. 12, June.
- DoHA (Department of Health and Ageing) 2003, *Trends in hospital activity: Australia 1991-92 to 2000-01*, Occasional Papers: New Series No15, July.
- Foster, R. and Stewart, S. 1991, *Australian Economic Statistics, 1949-50 to 1989-90*, Reserve Bank of Australia, Occasional Paper No. 8, February, Sydney.
- Fuchs, V. 1998, *Health care for the elderly: How much? Who will pay for it?*, National Bureau of Economic Research, Working Paper 6755, October.
- Fuchs, V. 1984, 'Though much is taken: Reflections on aging, health, and medical care', *Millbank Memorial Funder Quarterly/Health and Society*, Vol. 62, No. 2,
- Gruen, D. and Garbutt, M. 2003, 'The output implications of higher labour force participation', Treasury Working Paper 2003-02, October, Canberra.
- Henry, K. 2003, Address to the Melbourne Institute's 40<sup>th</sup> Anniversary Dinner, Melbourne University, 7 February.
- Hoover, D. Crystal, S., Kumar, R., Sambamoorthi, U. Cantor, J. 2002, 'Medical expenditures during the last year of life: findings from the 1992-96 Medicare Current Beneficiary Survey', *Health Services Research*, 37:6, December.
- Jacobzone, S. 2003, 'Ageing and the challenges of new technologies: can OECD social and healthcare systems provide for the future', *The Geneva Papers on Risk and Insurance*, Vol. 28, No. 2, April.
- Kennedy, S. and Hedley, D. 2003, 'A note on educational attainment and labour force participation in Australia', Treasury Working Paper 2003-03, November, Canberra.



- McDonald, P. and Kippen, R. 2000, Population Futures Australia and New Zealand: An Analysis of the Options, *New Zealand Population Review*, 26(2), 45-65.
- Madge, A. 2000, Long-Term Aged Care: Expenditure Trends and Projections, Productivity Commission Staff Research Paper, AusInfo, Canberra, October.
- Manton, K. and Gu, X. 2001, 'Changes in the prevalence of chronic disability in the United States black and non-black population above 65 from 1982 to 1999', *Proceedings of the National Academy of Science*, Vol. 98, No. 11, May.
- Mathers, C., Penm, R., Carter, R. and Stevenson, C. 1998, *Health System Costs of Disease and Injury in Australia 1993-94, An Analysis of costs, service use and mortality for major disease and injury groups*, AIHW, Canberra,
- Productivity Commission 1999, Nursing Home Subsidies, Inquiry Report No. 4, 13 January, Ausinfo, Canberra.
- \_\_\_\_\_ and Melbourne Institute of Applied Economic and Social Research 1999, Policy Implications of the Ageing of Australia's Population, Conference proceedings, AusInfo, Canberra.
- \_\_\_\_\_ 2003, Productivity Submission to the Review of Pricing Arrangements of Pricing Arrangements in Residential Aged Care, June.
- Ravindirian, R., Rawnsley, T. and Jose, A. 2002, 'A cohort analysis of unemployment rates for Australia', Analytical Services Branch, Australian Bureau of Statistics, paper presented at the 31<sup>st</sup> Annual Conference of Economists, September 2002, Adelaide.
- Richardson J. and Robertson I. 1999, 'Ageing and the cost of health services', in *Policy implications of the ageing of Australia's population*, Productivity Commission, March, Melbourne.
- Sheehan, P. 2002, 'Health Costs, Innovation and Ageing', Working Paper No. 9, Pharmaceutical Industry Project, Equity, Sustainability and Industry Development, Working Paper Series, Victoria University, Melbourne.
- Steering Committee for the Review of Commonwealth/State Service provision (various years), *Report on Government Services*, AusInfo, Canberra.
- Vamplew, W. (ed.) 1987, *Australians: Historical Statistics*, Fairfax, Syme and Weldon Associates.
- Withers, G., Endres, T. and Perry, L. 1985, *Australian Historical Statistics: Labour Statistics*, Australian National University Source Papers in Economic History No. 7, December, Canberra.
- Zwiefel P., Felder S. and Meirs M. 1999, 'Ageing of population and health care expenditure: a red herring?', *Health Economics*, Vol 8, pp. 485-496.

## End Notes

- <sup>1</sup> The effect of productivity growth on government budgetary costs of ageing, however, are less dramatic, since wage costs associated with health and aged care could be expected to increase with productivity — as noted by Gruen and Garbutt (2003). Also, to the extent that the gain is in labour productivity alone and not in multifactor productivity, then it has to be paid for through some investment (eg capital equipment or greater human capital accumulation). So the gain is not a pure welfare benefit.
- <sup>2</sup> Where the taxable income of a beneficiary plays a part in means testing arrangements for any government-outlays programme which that person benefits (or may benefit) from, that also should be taken into account and trust distributions tuned to ensure that *effective* marginal tax rates above 30 percent are not triggered.
- <sup>3</sup> Those who are sceptical of the notion that age matters also point to the failure of some macro–econometric studies among countries or across time to identify ageing as a major source of growth (Sheehan 2002 and Jacobzone 2003). However, the results may reflect the importance of confounding factors (such as non-age related trends in spending) and the difficulty of precisely measuring ageing impacts during periods when relatively little ageing took place. Nevertheless, these results warrant further study.