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The Distributional Impact of Government Outlays on the Australian Pharmaceutical Benefits Scheme in 2001-02

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About NATSEM

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NATSEM aims to be a key contributor to social and economic policy debate and analysis by developing models of the highest quality, undertaking independent and impartial research, and supplying valued consultancy services.

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It must be emphasised that NATSEM does not have views on policy. All opinions are the authors' own and are not necessarily shared by NATSEM or its core funders.

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Abstract

In recent years outlays on the Pharmaceutical Benefits Scheme have increased rapidly, prompting both attempts by government to reduce growth in outlays and renewed interest in the characteristics of the beneficiaries of the Scheme. This paper, using a microsimulation model of the PBS, analyses the distributional impact of Commonwealth Government outlays on the PBS, by such characteristics as family income, family type, age, gender and lifecycle group. As it is not possible with the current version of the model to comprehensively simulate the PBS Safety Net, the results presented are for the first two weeks of January 2002, before any families become eligible for safety net concessions. As expected, we find that the PBS is highly progressive, with two-fifths of total PBS government outlays being directed at the poorest one-fifth of Australians. There are pronounced distributional effects by age and gender - older Australians receive far greater PBS benefits than younger Australians and women receive higher benefits on average than men. An estimated 11 per cent of total PBS government outlays are directed towards women aged 75 years and over. Couples without children received 47 per cent of total PBS subsidies, reflecting the significance of older retiree couples. Single people received one-third of total PBS outlays, sole parent families 9.2 per cent and couple with children families 17.3 per cent. Pronounced effects are also observed over the lifecycle, with average government subsidies rising with age and, in retirement in particular, with a sharp increase in the proportion of the population eligible for PBS concession cards.

Author note

Ann Harding is Professor of Applied Economics and Social Policy at the University of Canberra and inaugural Director of the University's National Centre for Social and Economic Modelling. Laurie Brown is a Principal Research Fellow and Annie Abello and Ben Phillips are Research Fellows at NATSEM.

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General caveat

NATSEM research findings are generally based on estimated characteristics of the population. Such estimates are usually derived from the application of microsimulation modelling techniques to microdata based on sample surveys.

These estimates may be different from the actual characteristics of the population because of sampling and nonsampling errors in the microdata and because of the assumptions underlying the modelling techniques.

The microdata do not contain any information that enables identification of the individuals or families to which they refer.

Contents

1 Introduction

The Pharmaceutical Benefits Scheme (PBS) was introduced by the federal government in 1948 to provide all Australians with reliable and affordable access to medicines. In 2000, some 87 per cent of community prescriptions were covered by the scheme[1], and on average, the Commonwealth Government subsidises patients to the extent of 84 per cent of the costs of PBS 'benefit paid' medicines. In the past few years, however, the Scheme has been under increasing pressure, with spending on the PBS representing one of the fastest growing areas of Commonwealth outlays. Since the early 1990s, PBS expenditures have grown at over 10 per cent a year — well above the growth in the total health budget (6 per cent) or the economy (4 per cent in terms of GDP). Demographic, economic and technological changes are expected to intensify the pressures upon the PBS during the next few decades. The OECD (2000) notes that in Australia, as in most other developed countries, real per capita public expenditures on pharmaceutical goods more than doubled over the past two decades.

The recent Treasury Inter-Generational Report concluded that total spending on health will double as a percentage of GDP between 2001-02 and 2041-42; that total projected spending will begin to exceed revenue in about 15 years time under current policy settings; and that under current policy settings the PBS will represent the fastest growing area of Commonwealth outlays in the next few decades (2002). Others have also raised concerns about how the PBS will cope with the wave of costly new therapies being developed as a result of the Human Genome project and other medical advances (Brown et al. 2001).

In recent budgets, the government has responded to these concerns, by increasing the level of contributions to be met by PBS patients and delisting certain medicines from the Pharmaceutical Benefits Schedule. Further, the May 2002 budget aimed to introduce a near 28 per cent increase in PBS copayments and safety net thresholds (with these proposed changes still stalled in the Senate at the time of writing). In the 2003-04 budget, the Government also announced an initiative to improve the monitoring of PBS entitlements by enhancing the capacity of the Health Insurance Commission to validate online the eligibility of Centrelink concessional cardholders to receive benefits under the PBS at reduced rates (see Section 2). In this environment, the question of who benefits from current PBS outlays has become particularly significant.

During the past two years NATSEM has been constructing a model of the distributional impact of Australia's pharmaceutical industry and the Pharmaceutical

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1 71% of scripts receive a government benefit and 16% of scripts receive no subsidy as the prices of the medicines fall below patient copayment levels (DHA, 2003).

Benefits Scheme, in partnership with Medicines Australia and with funding support from an ARC Linkage grant. This paper uses that model to estimate the current distributional impact of the PBS, by such characteristics as age, gender, family type and income, and by concessional cardholder status.

Section 2 of this paper describes the main features of the PBS and the version of the PBS model used to produce these results, and describes how the current model differs from earlier efforts to model the distributional impact of the PBS. Section 3 examines the estimated current distributional impact of the PBS outlays and Section 4 concludes.

2 Overview of the PBS and the model

The Commonwealth Government's Pharmaceutical Benefits Scheme (PBS) aims to provide Australians with timely, reliable and affordable access to necessary and cost-effective prescription medicines (DHA 2001). The PBS was designed originally in 1948 to provide access for all Australians to a 'free-list' of life-saving medicines. Medicines must be approved for use in Australia and then be assessed as being cost effective in order to be listed on the scheme. The scheme covers Australian residents and eligible foreign visitors. Today, about 2500 medicines are listed on the PBS.

Patients are required to make a contribution to the cost of prescribed medicines listed on the PBS. Individuals and families eligible for certain Commonwealth Government (Centrelink) pensions and allowances are able to access PBS medicines at concessional rates. The PBS also has 'Safety Net' arrangements to protect individuals and families from large overall expenses for PBS listed medicines. Patient copayments and safety net thresholds are indexed to movements in the Consumer Price Index from 1 January each year.

Patients may pay more than the copayment where a PBS item is priced above the benchmark price for different brands of the same drug, or the benchmark price for a particular therapeutic group of drugs. The Government pays the additional cost of drugs exceeding patient copayments up to the benchmark price only. Brand or therapeutic group premiums do not count towards safety nets.

2.1 PBS settings in 2001-02

The policy settings of the Pharmaceutical Benefits Scheme for 2001-02, the base year for the model simulations, are given in Table 1. The figures show that:

- for *general* patients the maximum contribution for each PBS medicine is $21.90, the government paying for the rest; and

- for *concessional* patients an additional subsidy applies, so that their maximum contribution is only $3.50 per PBS medicine.

Although some PBS medicines can cost over $100, patients are required to pay at most $21.90. If the full price of the drug is below $21.90 (or $3.50) then the patient pays the full price – these drugs are known as 'below copayment' drugs and are not included in PBS statistics.

Families[2] needing a lot of medicines in any one year are protected by the PBS safety net. Once a family that does not have concessional benefits records spending beyond the safety net limit of $669.70 in a calendar year, they are required to pay only $3.50 for each further PBS medicine within the same year. For concessional patients there is no cost once their families have a record of spending beyond the safety net limit of $182.00 in a calendar year. In this case the government pays the full price of all further PBS medicines prescribed within the year. Each year, on 1 January, the safety net for each family is effectively reset to zero for administrative purposes.

Table 1 **Policy settings of the Pharmaceutical Benefits Scheme, 2001-02**

	1/1/2001	1/1/2002
	$	$
Copayment — Concessional		
Below safety net	3.50	3.60
Above safety net	0	0
Copayment — General		
Below safety net	21.90	22.40
Above safety net	3.50	3.60
Safety net – Concessional	182.00	187.20
Safety net – General	669.70	686.40

Source: Department of Health and Ageing website.

2.2 Earlier models of the PBS

There is a significant body of earlier work examining the distributional impact of the PBS, including that by the ABS (2001), Johnson et al. (1995), Percival and Schofield (1995), Harding (1995), Harding et al. (2002) and Schofield (1998). With the exception of the latter paper by Schofield, all the other studies of the distribution of PBS benefits have essentially involved dividing families into the relevant PBS beneficiary groups; calculating the average number of scripts used by age and gender; and then

2 A 'family' is defined as including a spouse (or de facto spouse), children under 16 years of age and full-time dependent students under 25 years of age.

calculating the average cost to government per script within each of the various PBS beneficiary groups. Multiplying average cost per script by the estimated number of scripts then results in an estimated PBS benefit being imputed to each individual within the model.

By imputing *average* script usage within the various age and gender cells, such studies have reduced the variance in script usage apparent in the real world. In addition, by imputing a single *average price per script*, any relationship apparent in the real world between the actual price of a PBS subsidised drug and sociodemographic characteristics of interest (such as income) is eliminated. These compromises in methodology were in part due to the difficulties created for such studies by their underlying data coming from the ABS national income or expenditure surveys. These surveys did not contain information about health status or pharmaceutical usage of individuals, thereby requiring imputation of pharmaceutical usage onto the records of each of the families within the database.

The study by Schofield overcame both of these common limitations (1998). Because her model was based on the National Health Survey unit record files, Schofield was able to look directly at the variance in the number of drugs used. In an additional refinement, she also imputed the average subsidy by medication for 11 medication types for each of the four PBS beneficiary categories existing in 1989-90.

Our current model further improves the modelling undertaken by Schofield, and incorporates variation in the number of drugs used by age, gender and PBS beneficiary category; includes far more detailed imputation of drug prices within each of 19 drug groups and 157 drug subgroups; includes a sophisticated forecasting capacity and has the capability to incorporate responses to changes in prices or PBS policy settings.

2.3 The PBS Model

Our microsimulation model is based upon the 1998-99 Household Expenditure Survey (HES) unit record file produced by the Australian Bureau of Statistics (ABS). This microdata provides a rich source of information about the demographic and economic characteristics of a representative sample of Australian families. NATSEM used this base data to produce a version of its STINMOD model (STINMOD/01A), which essentially involved updating the incomes and housing costs of those captured in the original HES, reweighting the dataset to allow for demographic and labour market change between 1998-99 and 2001, and imputing the receipt of a wide range of social security payments and the payment of income tax liabilities. Importantly, this latter step also means that the receipt of the variety of pharmaceutical concession cards was imputed for each family within the dataset.

The HES data do not, however, contain any information about the usage of prescribed pharmaceuticals — only about the spending of each household on prescription medicines. Accordingly, a second ABS unit record file, the 1995 National Health Survey, was used to derive information on the usage of prescribed pharmaceuticals across 19 drug classes, by age, gender and concessional (i.e. 'card') status. From this, the estimated number and type of prescribed pharmaceuticals used by age, gender and concession card status was imputed for each person within the Household Expenditure Survey. Those within the 'general' patient category with higher spending on pharmaceuticals within the HES survey were allocated more scripts than those with no such spending — that is, a link was made during the imputation process between spending on drugs in the HES and the number of drugs used in the NHS. Ultimately, each person in the PBS model selected to use prescribed pharmaceuticals had one or more of the 19 drug types allocated to them, so that within each card, age and gender cell the drug usage pattern in the model matched the usage pattern in the NHS.

A third dataset on the costs of the pharmaceuticals used was then prepared, using the average per script costs observed administratively for each of the drug classes in that year. The latest version of the model inputs a *distribution* of prices for each of the 19 drug classes at a greater level of disaggregation (at the ATC level) rather than simply using the average price per drug class. The price distribution at the ATC level ranged from 1 to a maximum of 10 prices for each drug group, with a total of 157 prices being used. This cost data was then merged onto the patient-based dataset, allowing estimation of the costs of the drugs used by each individual in the PBS.

Finally, the initial results arising from the PBS model were aligned with Health Insurance Commission (HIC) data on actual scripts for 2001-02. After the completion of all of these steps, the PBS model is able to estimate total patient and government expenditures on PBS subsidised drugs in 2001-02, as well as the impact upon particular types of individuals and families of the PBS.[3] The PBS model is a microsimulation model, with aggregated output being derived by summing together

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[3] Note that many users of prescribed pharmaceuticals do not receive a PBS subsidy for the use of a particular pharmaceutical (e.g. because the price of the drug is below their co-payment or because it is a private script i.e. the drug is not listed on the PBS). These costs to consumers are not included in the following estimates of private contributions to the costs of PBS-subsidised drugs (that is, the following estimates of family contributions to drugs are *only* for those drugs for which a government benefit was paid). The costs of *all* prescribed pharmaceuticals to consumers are thus higher than shown in the following tables. An additional reason why costs to consumers of all prescription drugs are higher than shown in this paper is that brand premiums – the gap between benchmark prices and negotiated prices for some drug brands which consumers are liable to pay – are also not included.

outcomes for the many thousands of individuals and households contained within the model.

One important limitation to the current version of our PBS model is that, due to reliance on survey data, difficulties were encountered in fully modelling the effects of the safety net. (About 20 per cent of all scripts in a year are safety net scripts.) This was because the safety net rule applies to the total spending on PBS medicines by a family in a calendar year. However, data on the drugs used during the course of a year by a particular family are not available. Instead, all that is available is the two-week sample of drug use provided by the national health survey.

To derive annual estimates, a standard practice is to multiply the two-week figures by 26. For most purposes this provides fairly reliable estimates, but it is not adequate for modelling the PBS safety net. For chronic conditions (when drugs are used regularly throughout the year), multiplying the NHS two-weekly figures by 26[4] might give a fair estimate of annual drug consumption. For non-chronic conditions, multiplying by 26 would give correct aggregate estimates within the age-sex-card cells but would over-estimate drug consumption for particular individuals and families. Thus, families consuming drugs for non-chronic conditions may incorrectly be shown to reach the safety net when, in actuality, the consumption of such drugs should have been spread out over several families, none of whom may have reached the safety net.

To roughly proxy the impact of the safety net, the current version of our model ensures that the proportion of scripts that reach the safety net limits is the same as that shown in administrative data. Before selecting the correct proportion of scripts to 'reach' the safety net, families are first ranked by the number of scripts they are estimated to consume within the fortnight, so that those with the highest number of scripts are assumed to reach the safety net first. (Schofield used a similar methodology (1998, p. 11).) This procedure results in correct annual cost estimates by drug type. However, the degree of reliability that can be attached to any resulting estimates of the annual distributional impact of the PBS is uncertain. It should be noted that this is also a limitation of all of the earlier studies of the distributional impact of the PBS mentioned above, even though all of them claim to represent the annual distributional impact of the PBS. In essence, both in our estimates and in all the earlier estimates, it appears likely that the proportion of total PBS outlays directed at the chronically ill is understated. To the extent that such chronic illness is correlated with such characteristics as age, gender, income and family type, then the estimates of the annual distributional impact of the PBS calculated from fortnightly drug usage patterns will be inaccurate.

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4 Based on preliminary analysis of annual patterns of drug usage, 13 seems to be the more realistic factor as the majority of scripts cover a thirty day supply of the prescribed drug.

Given this uncertainty, the results presented in this paper focus on only the distributional impact of the PBS in the first fortnight in 2002 — when the safety net thresholds have just been reset to zero and before any families become eligible for the safety net. In future work we hope to simulate patterns of morbidity and drug use across a calendar year and will then be able to assess the impact of the safety net with greater precision.

3 Distributional impact of the PBS

What types of Australians benefited from the $4.2 billion spent on the PBS by the Commonwealth Government in 2001-02? The PBS touches the lives of most Australians, with the overwhelming majority of Australians consuming at least one prescribed pharmaceutical during the course of a year — and with about 30 per cent of all Australians living in families that possess concessional cards and thus benefit from greatly reduced prescription drug costs. One of the key characteristics of the PBS is that four-fifths of all government outlays are targeted towards concessional patients — $3348 million vs. $840 million for general patients. As concessional patients are largely social security and family payment recipients on relatively low incomes, this immediately illustrates one of the key policy dilemmas facing government: reducing or restraining outlays on the PBS in any substantial way necessarily involves affecting low income Australians, given that they are overwhelmingly the beneficiaries of the current scheme.

3.1 Income

An estimated 41 per cent of all PBS government outlays are directed towards the poorest one-fifth of Australians.[5] In sharp contrast, just under 8 per cent of total PBS outlays are received by the most affluent one-fifth of Australians (Figure 1).

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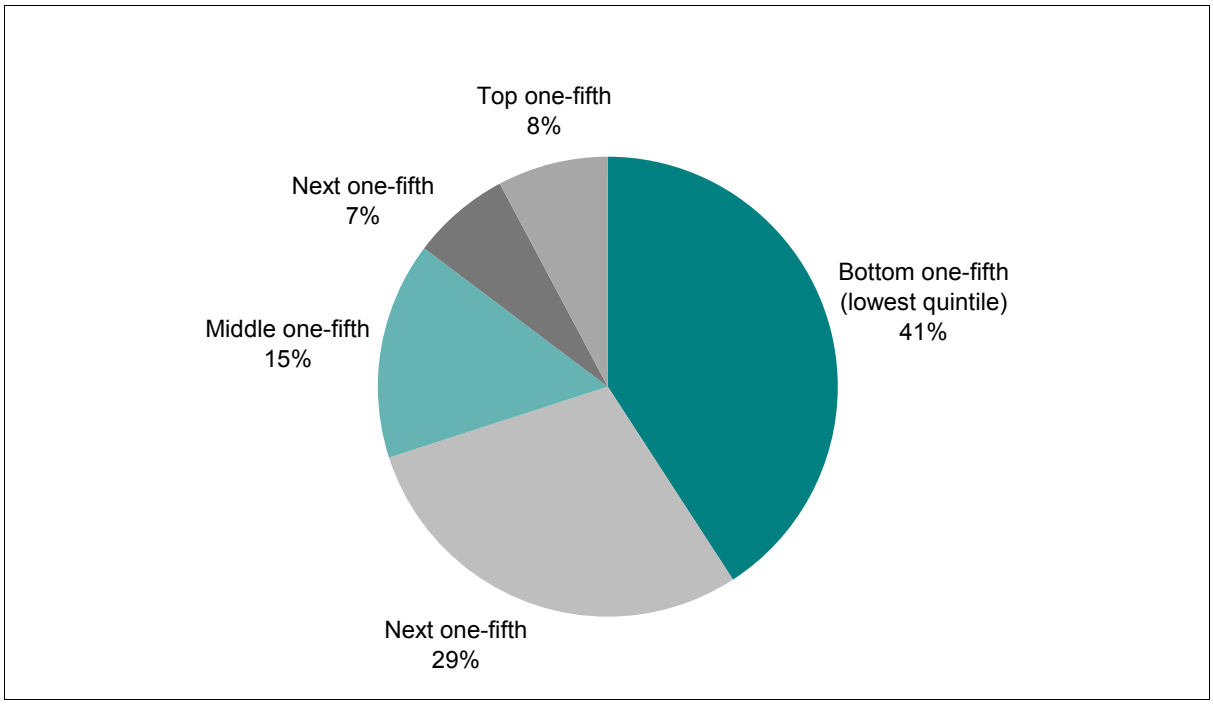
5 All Australians in private dwellings have been ranked here by the equivalent disposable (i.e. after income-tax) income of their family. A family is defined here rather narrowly as a nuclear family, meaning a couple without children, a couple with dependent children, a sole parent with dependent children or a single person. Dependent children are defined as children aged 0 to 14 years, or aged 15 to 24 years and engaged in full-time study, or non-fulltime students aged 15-20 who do not qualify for the Youth Allowance but are considered dependents for Family Tax Benefit purposes. . An equivalence scale is used to adjust the income of each family, in an attempt to place families with a differing number of mouths to feed on a more equal basis. The equivalence scale used is the new OECD scale, which gives a value of 1 to a single adult, 0.5 to a second adult and 0.3 to each dependent child.

Figure 1 **Estimated proportion of total PBS Government outlays received by each quintile of Australians, ranked by income (1-14 January 2002)***



Note: All Australians living in private dwellings have been ranked here by the equivalent disposable income of their family (see footnote 5 and notes under Table 2). The top one-fifth (or quintile) consists of the 20 per cent of Australians living in families with the highest equivalent disposable incomes.

This highly pro-poor pattern of outlays reflects the higher subsidy received by each person living in lower income families. Table 2 traces the average PBS subsidy received by high and low income families — but these estimates can give a distorted impression of distributional impact because there are systematic variations in family size by income. Accordingly, Table 2 also shows PBS outlays *per person* in the family. As the first of the three panels in Table 2 shows, the poorest one-fifth of all Australians received an average PBS subsidy of $8.70 a week during our fortnightly window, compared with $1.60 per person for the one-fifth of Australians living in the most affluent families.

The after-tax family income of the poorest one-fifth of Australians is, of course, much lower than those of the most affluent one-fifth, so the PBS subsidy delivered by the Federal government is a very important contributor to the living standards of low income families. For the one-fifth of Australians living in the lowest income families, the PBS subsidy reaches six per cent of their after-tax family income during our fortnightly window while, for the most affluent one-fifth, the proportion is only 0.3 per cent (top panel in Table 2).

Another possible perspective is to separate the concessional and general populations, and then calculate income quintiles for each group (rather than for the population as a whole, as done above). Thus, in this case, 'concessional quintile 1' equates to the

poorest 20 per cent of Australians living in families that receive concessional pharmaceuticals, while 'general quintile 1' represents the poorest 20 per cent of Australians living in families that do not receive concessional pharmaceuticals. Figure 2 traces PBS government outlays received as a percentage of disposable income, for all Australians and for those who live in concessional and general families.

Table 2 **Estimated impact of the PBS for concessional, general and all families, ranked by income quintile (1-14 January 2002)***

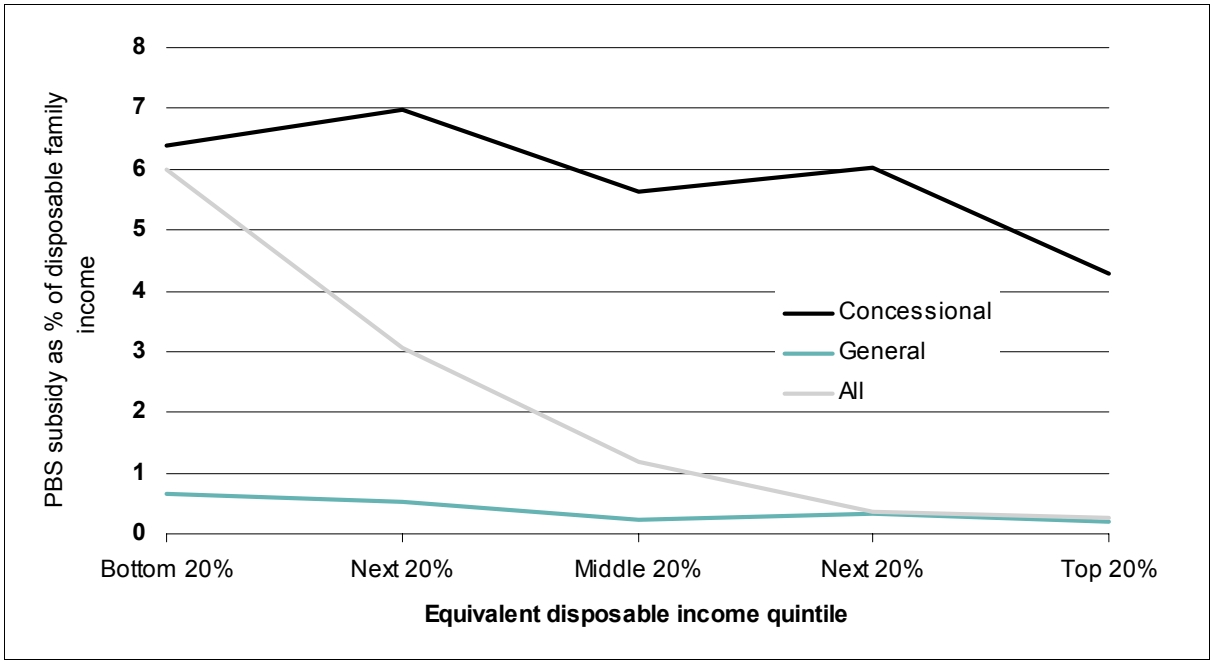
			Equivalent disposable income quintile a					
		Unit	Bottom 20%	Next 20%	Middle 20%	Next 20%	Top 20%	All
All patients								
Gross weekly income per family		$	205	464	723	1,014	1,782	796
Disposable weekly income per family **b**	(1)	$	204	436	612	805	1,293	638
Equivalent disposable weekly income per family **c**		$	255	448	619	848	1,362	676
Government subsidy per week on PBS drugs	(2)	$	12.2	13.3	7.3	3.0	3.3	8.1
Govt subsidy per week per person on PBS drugs	(2/3)	$	8.7	6.0	3.2	1.4	1.6	4.3
Government subsidy as proportion of income	(3/1)	%	6.0	3.1	1.2	0.4	0.3	1.3
% of all PBS government subsidy received by this group		%	**40.9**	**29.1**	**15.3**	**6.8**	**7.8**	**100.0**
Average family size	(3)	no.	1.4	2.2	2.3	2.1	2.0	1.9
No. of families ('000)		no.	2,655	1,735	1,674	1,831	1,892	9,787
No. of persons ('000)		no.	3,791	3,791	3,792	3,791	3,791	18,956
Concessional patients only								
Gross weekly income per family		$	194	285	357	438	612	349
Disposable weekly income per family **b**	(1)	$	194	285	355	428	564	339
Equivalent disposable weekly income per family **c**		$	275	338	378	442	595	386
Government subsidy per week on PBS drugs	(2)	$	12.4	19.9	20.0	25.8	24.2	19.4
Govt subsidy per week per person on PBS drugs	(2/3)	$	10.3	12.4	9.5	11.7	11.5	11.4
Government subsidy as proportion of income	(3/1)	%	6.4	7.0	5.6	6.0	4.3	5.7
% of all PBS government subsidy received by this group		%	**14.9**	**17.6**	**13.3**	**16.6**	**16.6**	**79.2**
Average family size	(3)	no.	1.2	1.6	2.1	2.2	2.1	1.7
No. of families ('000)		no.	955	703	528	511	546	3,243
No. of persons ('000)		no.	1,115	1,118	1,114	1,118	1,117	5,582
General patients only								
Gross weekly income per family		$	299	721	921	1208	1962	1016
Disposable weekly income per family **b**	(1)	$	273	604	740	939	1401	786
Equivalent disposable weekly income per family **c**		$	285	603	776	980	1482	820
Government subsidy per week on PBS drugs	(2)	$	1.8	3.2	1.7	3.1	2.9	2.5
Govt subsidy per week per person on PBS drugs	(2/3)	$	1.0	1.4	0.8	1.5	1.5	1.3
Government subsidy as proportion of income	(3/1)	%	0.7	0.5	0.2	0.3	0.2	0.3
% of all PBS government subsidy received by this group		%	**3.4**	**4.6**	**2.7**	**5.0**	**5.0**	**20.7**
Average family size	(3)	no.	1.8	2.3	2.1	2.1	2.0	2.0
No. of families ('000)		no.	1,492	1,159	1,272	1,290	1,360	6,572
No. of persons ('000)		no.	2,674	2,675	2,675	2,674	2,676	13,374

Notes**: a** To divide the population into quintiles, each person has been ranked by the equivalent disposable income of their family. The quintiles have been separately calculated for each of the three groups – namely 'concessional', 'general' and 'all'. Thus, the bottom quintile of concessional patients is the bottom 20 per cent of individuals who live in families that have a concession card, after ranking by the equivalent disposable income of their family. Similarly, the bottom quintile of the 'All patients' group is the bottom 20 per cent of all Australians, after ranking by the equivalent disposable income of their family. **b** Disposable income means gross income of the family minus income tax. **c** Equivalent income after application of the new OECD equivalence scale.

Looking at Australians living in families eligible for concessional pharmaceuticals first, the middle panel in Table 2 suggests that there is not a pronounced variation between the concessional income quintiles in the value of PBS subsidy received by person. (That is, this ranges from an estimated $10.30 per person for those in the lowest concessional quintile to $11.50 a week per person for those in the highest concessional quintile.) The disposable family incomes of the four lower concessional quintiles are also relatively equal, with the disposable incomes of those in the second highest concessional quintile being only a little over twice as great as those in the lowest concessional quintile. As a result, for four of the five concessional income quintiles, the value of PBS subsidy received is relatively equal, at about six per cent of disposable family income. Only for the highest concessional income quintile (which includes self-funded retirees), does the PBS subsidy drop to only 4.3 per cent of disposable income (Figure 2).

Moving to those who do not hold concessional pharmaceutical cards, there is greater divergence in the average per person value of PBS subsidy received – ranging from an estimated $1 a week for the bottom general quintile to $1.50 per person per week for those in the highest general quintile. The incomes of general patients are, however, far more dispersed than those of concessional patients, with the disposable income of the top quintile being more than six times higher than that of the bottom quintile. The variation in the PBS subsidy as a percentage of income is therefore correspondingly higher, ranging from an estimated 0.7 per cent of family income for the bottom quintile of general patients to only 0.2 per cent of disposable family income for the top quintile of general patients.

Figure 2 **Estimated PBS subsidy received as a proportion of disposable income, by income quintile (1–14 January 2002)***



Note: See notes under Table 2 for a description of the quintiles.

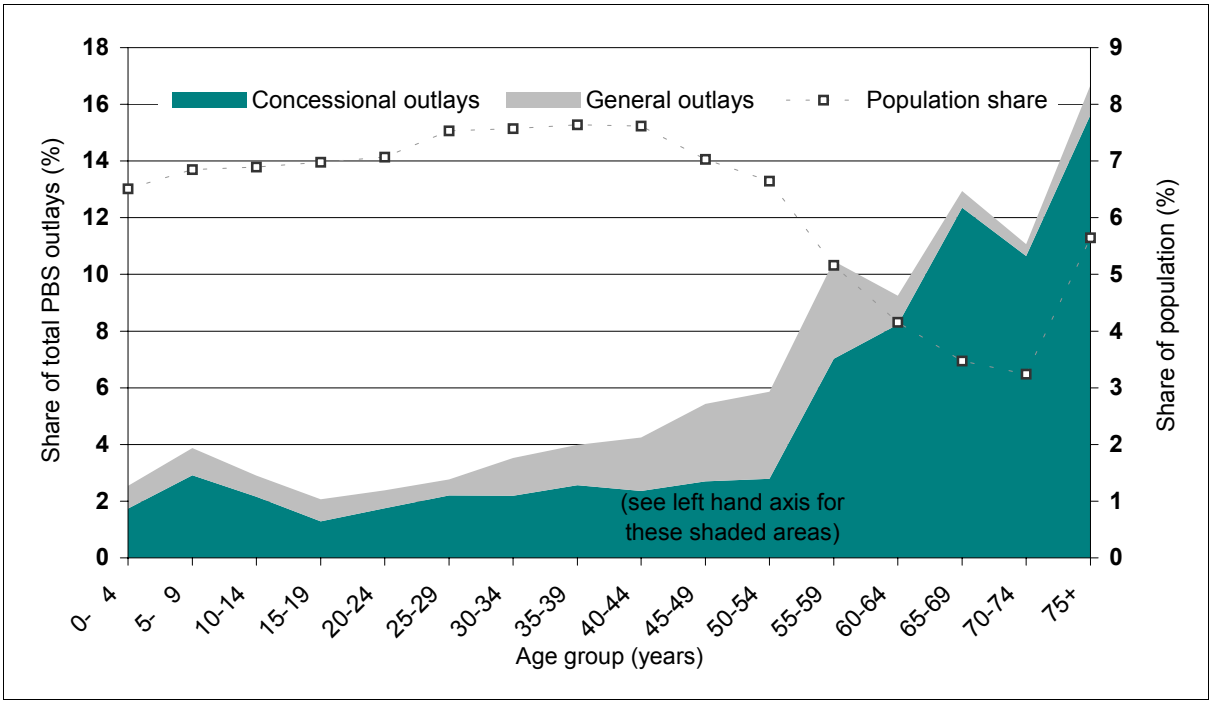
It should be noted that all of the above results are for the entire population, not just for those who actually purchased PBS pharmaceuticals during our fortnightly window. Thus, in essence, the above results average out the effects for those who are and are not sick during this period.

3.2 Age and gender

While partly related to income, age is another key driver of the receipt of PBS benefits. Figure 3 emphasises again how outlays on concessional patients dominate the system. It also illustrates clearly how negligible are outlays on general patients aged 60 years and above. During childhood and adolescence, between two-thirds and three-quarters of all PBS government outlays are received by concessional families, with the remainder being directed at children living in families that are not within the social security and family payments safety net.

During the years of the 30s, about two-thirds of all PBS outlays go to those living in concessional families, with this proportion falling to its lowest level of about half of all PBS outlays when individuals are in their late 40s and early 50s. During this period of the life cycle, Australians are relatively more likely to have become 'empty nesters', be in employment and not be dependent on the welfare or other benefits that provide a passport to the concessional PBS card. However, this profile changes

Figure 3 **Estimated proportion of total PBS government outlays received, compared with population share, by age group (1–14 January 2002)**



dramatically during the retirement years after age 55. From age 65 onwards, about 95 per cent of all PBS outlays directed at this age group go to concessional families, reflecting the high rates of receipt of the age pension and the extension in recent years of PBS concessional status to most self-funded retirees. In addition, of course, the pattern of rising total PBS outlays across the life cycle is a product of increasing rates of morbidity as age increases, reflected in the steady rise in script numbers after the age of 20 years.

The pattern of PBS benefits generally rising steadily with increasing age stands in sharp contrast to the underlying population distribution. Of every six dollars spent by Government on the PBS, one dollar was received by a person aged 75 years or more. And yet while this age group received almost 17 per cent of total PBS government outlays, they represented only 4.8 per cent of Australians living in private dwellings.[6] Conversely, Australians aged 20 to 24 received only 2.4 per cent of total PBS government outlays but represented 7 per cent of the Australian population.

There are also fascinating differences in the usage of prescribed pharmaceuticals by gender and thus in the distribution of PBS outlays by gender. Overall, 56.5 per cent of total PBS government outlays are estimated to be received by females, and the remaining 43.5 per cent by males. What underlies the higher proportion of PBS outlays going to women? An obvious explanation is that there are more elderly females in the population than males and that older Australians use prescribed medicines more than younger persons (Table 3). Another important part of the story is that in general women have higher utilisation rates for PBS subsidised drugs than do men. On average women received about 3.38 million scripts during our fortnightly window compared with 2.54 million for men. Put another way, in our fortnightly snapshot, 35 PBS subsidised scripts are being utilised by every 100 women living in private dwellings, whereas the comparable figure for men is 27 scripts for every 100 men (Table 3). Another factor affecting the relative balance of outlays between the sexes is differences in the average price to government of the drugs consumed — and thus in the PBS subsidy paid by government — the average price to government for each script being estimated at $27.46 for males and $26.85 for females. This difference reflects differences in concessional cardholder status and in the types of drugs used. Overall, however, this is a less significant part of the story.

While overall PBS outlays for women might exceed those for men, there are pronounced differences in the pattern by gender *at different points in the life cycle*. Looking at childhood first, boys aged 0 to 14 years receive an estimated $8.6 million

6 As noted earlier, the model only includes the population living in private dwellings (e.g. those living in nursing homes or prisons are excluded).

Table 3 **Estimated impact of the PBS by age group and gender (1–14 January 2002)**

	Males					Females				
Age range	Number of scripts (in that fortnight '000)	% of scripts that are concessional	Estimated utilisation rate (No of PBS subsidised scripts per 100 men)**a**	Cost to government ($m in that fortnight)	% of total PBS outlays	Number of scripts (in that fortnight '000)	% of scripts that are concessional	Estimated utilisation rate (No of PBS subsidised scripts per 100 women)**a**	Cost to government ($m in that fortnight)	% of total PBS outlays
	No '000	%		$m	%	No '000	%		$m	%
0-4	93	77	14	2.3	1.5	76	80	12	1.7	1.1
5-9	135	80	20	3.8	2.4	93	79	14	2.4	1.5
10-14	95	68	14	2.4	1.5	82	89	13	2.2	1.4
15-19	64	73	10	1.6	1.0	61	64	10	1.7	1.0
20-24	36	91	5	0.9	0.6	96	80	14	2.9	1.8
25-29	70	88	10	2.1	1.3	88	79	12	2.3	1.4
30-34	79	68	11	2.4	1.5	115	80	16	3.2	2.0
35-39	78	56	11	2.8	1.7	141	76	19	3.6	2.3
40-44	76	50	10	2.1	1.3	143	76	19	4.7	2.9
45-49	138	62	20	3.7	2.3	144	70	21	5.0	3.1
50-54	101	47	16	3.1	1.9	187	63	29	6.3	3.9
55-59	256	72	51	8.2	5.1	267	78	54	8.6	5.4
60-64	200	81	50	5.6	3.5	342	93	86	9.2	5.8
65-69	351	98	109	10.0	6.3	408	98	121	10.7	6.7
70-74	356	97	124	9.1	5.6	357	93	112	8.7	5.4
75+	410	92	107	9.4	5.9	777	97	146	17.3	10.8
All	**2,537**	**82**	**27**	**69.7**	**43.5**	**3,377**	**87**	**35**	**90.7**	**56.5**

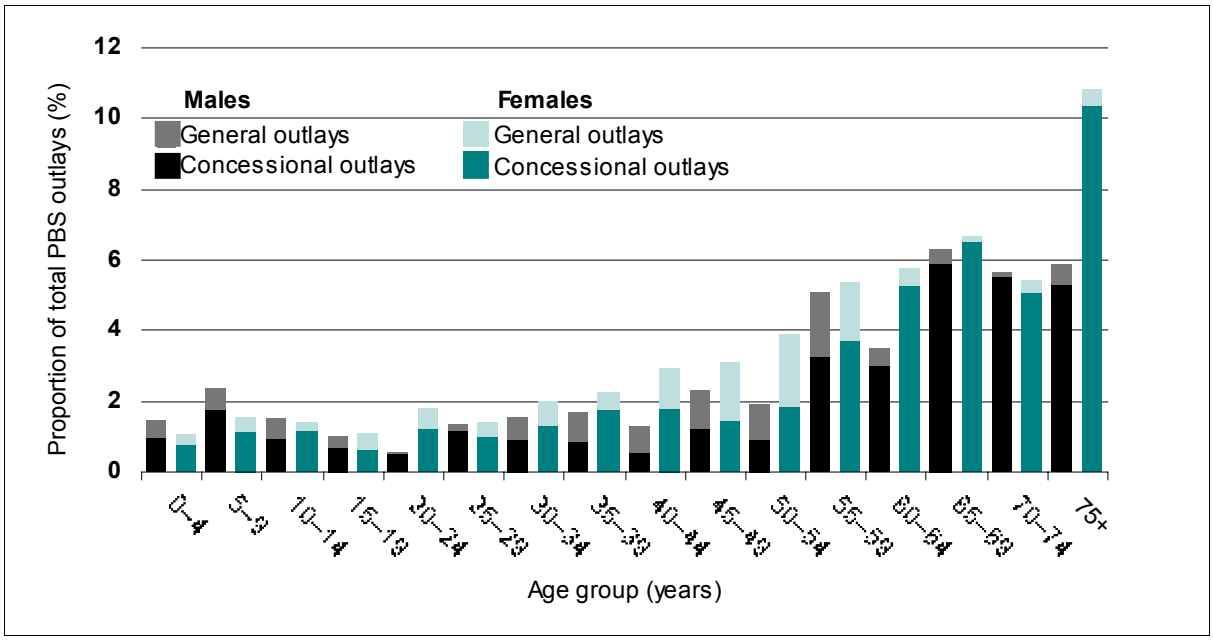
in PBS subsidies during our fortnightly snapshot, with girls of the same age receiving an estimated $6.4 million during the same period. During the teens the pro-male pattern of PBS outlays apparent during childhood changes to one that is reasonably equal between the sexes (Figure 4). Then the picture changes abruptly once again, as young Australians reach their 20s. During the years of child bearing and rearing, women's receipt of PBS benefits remains substantially higher than that of men, with PBS outlays on females aged 20 to 54 amounting to $28.0 million during our fortnightly window, compared with $17.2 million for males of the same age.

The profile shifts somewhat during retirement, with the PBS outlays received by men being reasonably close to that of women during the 10 years after age 65 years, but then again falling sharply below that of women after the age of 75 years.

A number of factors underlie these lifetime shifts in PBS outlays between the sexes. During the childhood years, population numbers from the ABS suggest that there are more males than females and this, allied with differences in health status and a higher script utilisation rate per male child than per female child between the ages of 0 and 14 years, produces the bias in PBS outlays towards males in the childhood years shown in Figure 4 and Table 3.

During the 20s, 30s and 40s, the numbers of men and women in the population are roughly equal, and it is the increased likelihood of women being given a PBS subsidised drug relative to men that underlies the higher PBS outlays directed towards women. For example, from ages 35 to 39, women have a utilisation rate that is almost double that of men of the same age.

Figure 4 **Estimated proportion of total PBS Government outlays received by gender and age group (1–14 January 2002)**



After the official retirement age of 65 years, men and women's utilisation rates are initially relatively equal, but then men's utilisation rates increase sharply from ages 70 to 74, presumably reflecting the poorer health and earlier death of men relative to women. From age 75 onwards, the relatively higher proportion of PBS outlays directed to women is due partly to a higher PBS drug utilisation rate but mainly to the greater number of women surviving to this age (with the number of women aged 75 plus living in private dwellings being about 40 per cent higher than the number of comparable men aged 75 plus). Looking at Figure 4, it is striking to see that almost 11 per cent of total PBS outlays are directed towards women aged 75 years and over.

3.3 Family type

One of the important redistributive effects of health outlays identified in earlier work is the support offered to families with children (ABS 2001; Harding et al. 2002). Accordingly, Figure 5 and Table 4 show the estimated value of the PBS subsidy received by different types of families in Australia.

As all parents know, the PBS is extremely important in reducing the financial pressures that parents would otherwise face in paying for pharmaceuticals. Looking first at couples with children who hold concession cards, the average government subsidy received each week increases steadily from $11.60 for a concessional couple with one child to $32.90 for a concessional couple with three children (middle panel in Table 4). The average benefit per concessional couple with children family is $22.80, slightly above the average for all Australian families who hold a concession card of $19.40.

Figure 5 **Estimated proportion of total PBS Government outlays received by family type (1–14 January 2002)**

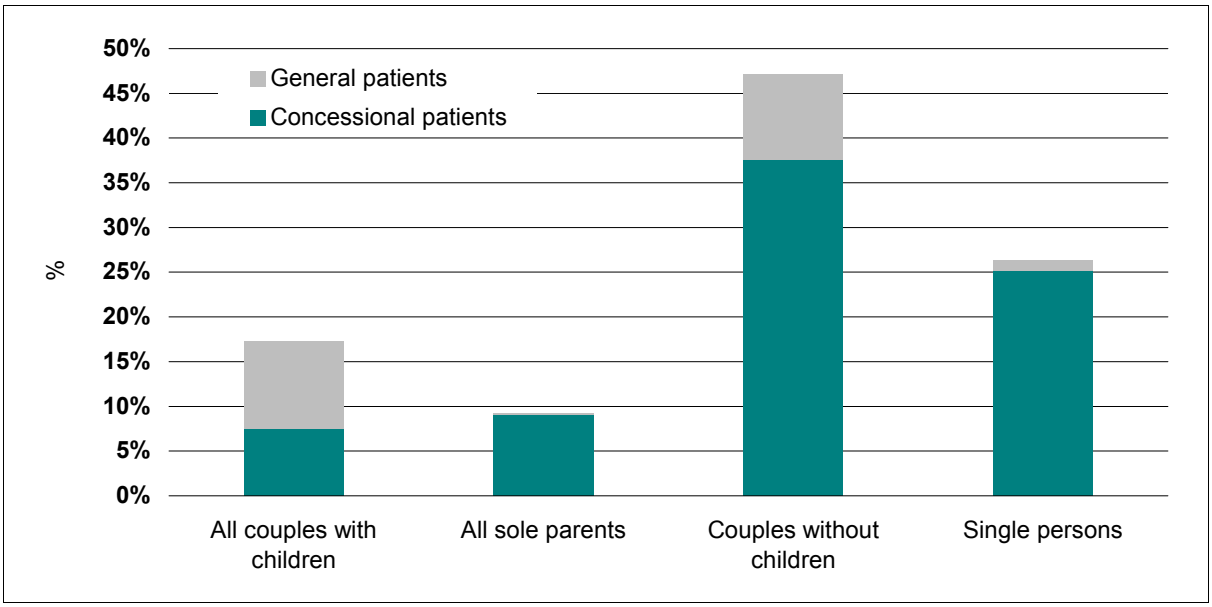


Table 4 **Estimated impact of the PBS by family type (1–14 January 2002)**

		Unit	Couples with children			All couples with children	Sole parents		All sole parents	All families with children	Couples without children	Single persons	All families
			1 child	2 children	3+ children		1 child	2+ children					
All patients													
Gross weekly income per family		$	1,383	1,393	1,372	1,385	545	608	577	1,210	983	485	796
Disposable weekly income per family **a**	(1)	$	1,062	1,073	1,084	1,072	484	568	527	954	791	396	638
Equivalent disposable weekly income per family **b**		$	885	766	661	784	558	497	527	728	791	594	676
Government subsidy per week on PBS drugs	(2)	$	5.9	6.3	9.0	6.8	7.3	18.6	13.1	8.1	16.0	4.3	8.1
Government subsidy as proportion of income	(2/1)	%	0.6%	0.6%	0.8%	0.6%	1.5%	3.3%	2.5%	0.8%	2.0%	1.1%	1.3%
% of all PBS government subsidy received by this group		%	**5.2%**	**6.8%**	**5.2%**	**17.3%**	**2.5%**	**6.7%**	**9.2%**	**26.4%**	**47.2%**	**26.4%**	**100.0%**
No. of families ('000)		'000	703	868	457	2,028	272	287	559	2,587	2,341	4,859	9,787
Concessional patients													
Gross weekly income per family		$	489	564	655	565	410	543	486	515	467	230	349
Disposable weekly income per family **a**	(1)	$	473	546	636	547	399	528	473	500	448	226	339
Equivalent disposable weekly income per family **b**		$	394	390	382	389	461	459	460	434	448	338	386
Government subsidy per week on PBS drugs	(2)	$	11.6	25.3	32.9	22.8	9.9	20.6	16.0	18.5	38.1	11.4	19.4
Government subsidy as proportion of income	(2/1)	%	2.5%	4.6%	5.2%	4.2%	2.5%	3.9%	3.4%	3.7%	8.5%	5.0%	5.7%
% of all PBS government subsidy received by this group		%	**1.3%**	**3.0%**	**3.1%**	**7.5%**	**2.4%**	**6.6%**	**9.0%**	**16.5%**	**37.6%**	**25.1%**	**79.2%**
No. of families ('000)		'000	89	95	76	260	193	254	447	707	782	1,754	3,243
General patients													
Gross weekly income per family		$	1512	1494	1512	1504	872	1118	943	1471	1236	629	1016
Disposable weekly income per family **a**	(1)	$	1147	1137	1172	1148	690	885	746	1124	960	492	786
Equivalent disposable weekly income per family **b**		$	956	812	716	841	796	797	796	839	960	738	820
Government subsidy per week on PBS drugs	(2)	$	5.0	3.9	4.4	4.4	0.8	2.7	1.3	4.2	4.8	0.3	2.5
Government subsidy as proportion of income	(2/1)	%	0.4%	0.3%	0.4%	0.4%	0.1%	0.3%	0.2%	0.4%	0.5%	0.1%	0.3%
% of all PBS government subsidy received by this group		%	**3.9%**	**3.8%**	**2.1%**	**9.8%**	**0.1%**	**0.1%**	**0.2%**	**10.0%**	**9.6%**	**1.2%**	**20.9%**
No. of families ('000)		'000	614	774	382	1,770	79	32	111	1,881	1,586	3,105	6,572

a Disposable income is gross income minus income tax. b Disposable income per family after applying equivalence scale.

Interestingly, however, relatively few couples with children are eligible for a concession card, as most are earning wages and are in their peak working years. Because only about 13 per cent of all couple with children families hold concession cards, the overwhelming majority of such families are outside the concession card net and thus receive a much lower PBS subsidy of only $4.40 a week (bottom panel in Table 4). Overall, couple with children families in Australia receive an estimated 17.3 per cent of total PBS outlays (Figure 5 and Table 4).

The profile for sole parent families is radically different, as an estimated four-fifths of all sole parent families possess a concession card. Sole parents with one child and a concession card receive almost $10 a week in PBS benefits, doubling to $20.60 a week for those with two or more children. The few sole parent families outside the concessional card safety net receive a negligible proportion of total PBS government outlays. Overall, just under another 10 per cent of all PBS outlays are directed towards sole parent families (both those with and without concession cards). Summing couples with children and sole parent families, all Australian families with children receive just over one-quarter of total PBS outlays.

Many Australians might be surprised to discover that the share of PBS outlays received by families with children is eclipsed by the slice of PBS outlays directed towards Australians without children — both couples without children and single people. As Figure 5 shows, almost one-half of all PBS outlays are received by couples without children. This is largely driven by the average benefit of $38.10 a week received by the 780 000 couples without children who hold concession cards. This high average benefit, allied with significant numbers of such couples, results in just under two-fifths of all PBS outlays being directed at concessional couples without children. (As Section 3.4 reveals below, this is due to the high number of retiree couples). While this is a very substantial slice of all PBS outlays, couples without children who do not hold concession cards outnumber those who do by 2:1. This high frequency in the population, allied with their above average PBS subsidy of about $4.80 a week, means that even couples without children who possess no concession cards take a further 9.6 per cent slice of total PBS government outlays.

Moving finally to single people, about two-thirds of all singles do not possess a concession card and receive an extremely low PBS subsidy per week of about 30 cents each. Consequently, even though single person families without concession cards represent about 30 per cent of all Australian families, they receive only 1.2 per cent of total PBS outlays. The 1.75 million singles who hold concession cards, however, receive an average PBS benefit of $11.40 a week and gain 25.1 per cent of total PBS outlays. (As discussed further in Section 3.4, this is largely due to older age pensioner singles with high pharmaceutical needs.)

3.4 Life cycle group

As noted earlier, there are major differences in the receipt of PBS government outlays by age and by family type. This suggests that the PBS has significant effects across the life cycle. Table 5 divides families into life cycle groups, largely using groups identified in earlier work by the ABS (2001). Single people who are aged less than 35 years receive an average PBS subsidy of only $1.20 per week during our fortnightly window — a lower amount than for any of the other life cycle groups considered in Table 5, with the exception of young couples without children. There are almost 2.5 million younger singles in the population: four-fifths of them are not concession card holders and, because they are relatively healthy due to their young age, this group account for only 3.8 per cent of total PBS outlays (Figure 6).

As age increases, many young singles settle with a partner, so couples without any dependent children and with a head aged less than 35 years are the next group considered in Table 5. This group receive the lowest share of total PBS government outlays of any of the life cycle groups examined in Table 5. In addition to their relative youth and thus health, only an estimated four per cent of such couples hold concession cards, so their PBS costs to government are commensurately low.

As the life cycle continues, many such couples start the child bearing and raising period. While only one in every 10 couples whose eldest child is aged less than five years are concession cardholders, the average weekly cost to government rises once children arrive. The PBS subsidy directed towards such young couples with children rises to $12.80 per week for those with concession cards and $2.10 a week for those without such cards.

Figure 6 **Estimated proportion of total PBS Government outlays received by life cycle group (1–14 January 2002)**

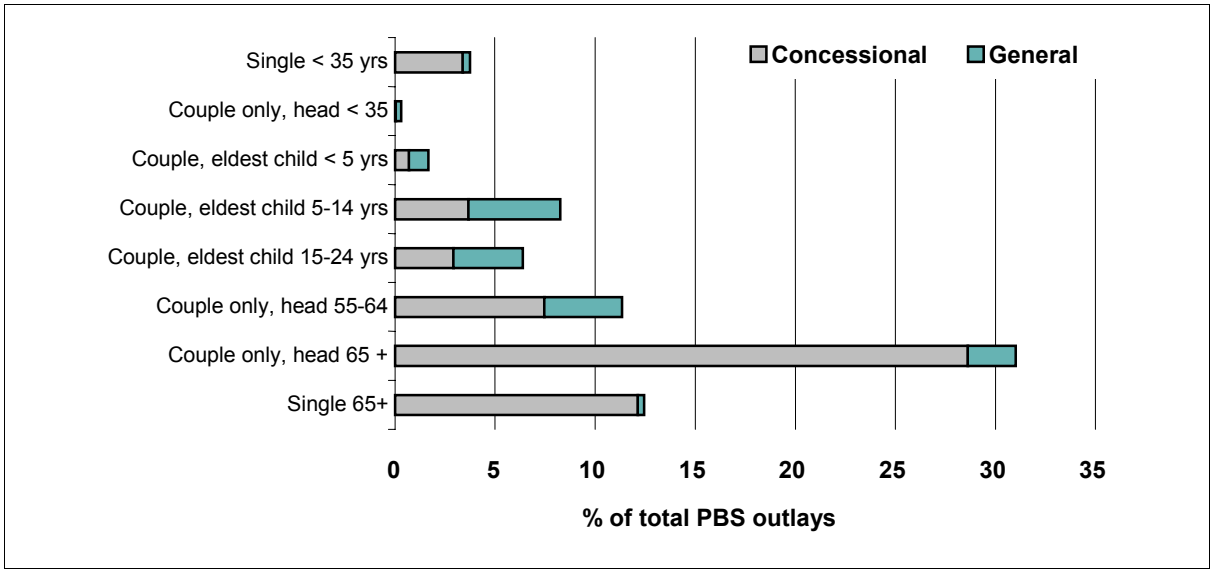


Table 5 **Estimated Impact of the PBS by life cycle group (1–14 January 2002)**

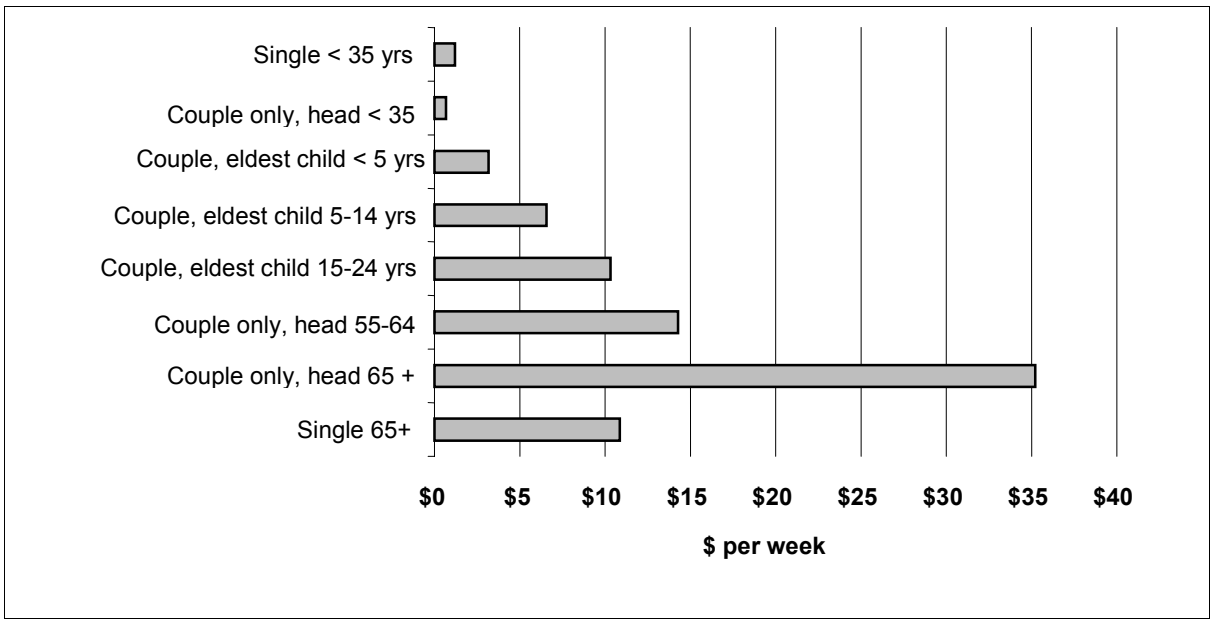
		Unit	Single < 35 yrs	Couple only, head < 35	Couple, eldest child < 5 yrs	Couple, eldest child 5-14 yrs	Couple, eldest child 15-24 yrs	Couple only, head 55-64	Couple only, head 65 +	Single 65+
All patients										
Gross weekly income per family		$	505	1,453	1,266	1,342	1,476	858	539	290
Disposable weekly income per family **a**	(1)	$	410	1,126	980	1,043	1,144	699	494	270
Equivalent disposable weekly income per family **b**		$	615	1,126	771	740	809	699	494	404
Government subsidy per week on PBS drugs	(2)	$	1.2	0.7	3.2	6.6	10.3	14.3	35.2	10.9
Government subsidy as proportion of income	(2/1)	%	0.3%	0.1%	0.3%	0.6%	0.9%	2.0%	7.1%	4.0%
% of all PBS government subsidy received by this group		%	**3.8**	**0.3**	**1.7**	**8.2**	**6.4**	**11.3**	**31.0**	**12.4**
No. of families ('000)		'000	2,469	349	415	1,005	495	636	710	959
Concessional patients										
Gross weekly income per family		$	201	444	552	576	560	423	488	255
Disposable weekly income per family **a**	(1)	$	197	419	529	557	547	408	467	250
Equivalent disposable weekly income per family **b**		$	296	419	416	383	380	408	467	375
Government subsidy per week on PBS drugs	(2)	$	5.1	1.8	12.8	20.9	39.4	30.9	44.0	13.5
Government subsidy as proportion of income	(2/1)	%	2.6%	0.4%	2.4%	3.7%	7.2%	7.6%	9.4%	5.4%
% of all PBS government subsidy received by this group		%	**3.4**	**0.0**	**0.7**	**3.7**	**2.9**	**7.4**	**28.6**	**12.1**
No. of families ('000)		'000	532	13	43	141	59	193	521	723
General patients										
Gross weekly income per family		$	589	1493	1347	1467	1601	1046	707	412
Disposable weekly income per family **a**	(1)	$	468	1154	1031	1123	1226	825	595	342
Equivalent disposable weekly income per family **b**		$	702	1154	811	798	868	825	595	513
Government subsidy per week on PBS drugs	(2)	$	0.2	0.6	2.1	4.3	6.4	7.0	9.1	1.1
Government subsidy as proportion of income	(2/1)	%	0.0%	0.1%	0.2%	0.4%	0.5%	0.8%	1.5%	0.3%
% of all PBS government subsidy received by this group		%	**0.4**	**0.3**	**1.0**	**4.6**	**3.4**	**3.9**	**2.4**	**0.3**
No. of families ('000)		'000	1,936	336	373	864	435	444	212	229

a Disposable income is gross income minus income tax. b Disposable income per family after applying equivalence scale.

As children grow older and average family size increases, the PBS subsidy continues to increase, rising from an average of $3.20 per week for couples whose eldest child is aged less than five years, to $6.60 a week for couples whose eldest child is aged from 5 to 14 years and $10.30 a week for those whose eldest dependent child is aged 15–24 years old (Figure 7).

The likelihood of ill health increases sharply as one grows older, with almost four-fifths of 55 to 64 years olds today reporting that they suffer from one of the national health priority conditions (Walker et al. 2003). As shown earlier, this correlates directly with rising pharmaceutical use. In addition, early retirement means that the proportion of 'couples with a head aged 55–64 years' who hold a concession card more than doubles from the roughly 12 per cent apparent for 'couples with children' to 30 per cent for this life cycle group. Rising drug usage allied with higher rates of concession card receipt together result in average weekly PBS outlays on this life cycle group reaching $14.30 a week and 11.3 per cent of total PBS outlays.

Figure 7 **Estimated value of weekly PBS Government outlays received by lifecycle group (1–14 January 2002)**



As noted earlier, the picture continues to change once the official retirement age is reached, with two factors combining to greatly push up the share of PBS government outlays going to these groups: first, the very high proportion that have access to a concession card (averaging about 70 per cent of each of the 'retiree' groups) and, second, the deterioration in health and thus increase in pharmaceutical usage that arises with advancing age. Retiree couples have a high weekly PBS subsidy of $35 and their share of total PBS outlays is 31 per cent.

Finally, the last life cycle group considered is single people aged over 65 years old. This group receives an average PBS subsidy of $10.90 a week and just over 12 per cent of total outlays.

4 Summary and conclusions

This paper has provided some of the first estimates for the 2000s of the distributional impact of the Pharmaceutical Benefits Scheme. The study relies on a detailed microsimulation model of the PBS, established with ARC Linkage funding. It must be noted that the model's current base data contains little information about whether or not the health conditions suffered by families are chronic and, accordingly, it is not possible with this version to comprehensively model the safety net. As a result, the results presented in this paper are for the first two weeks of January 2002, before any families become eligible for the safety net. To the extent that the likelihood of reaching the safety net differs between the population groups examined in this paper, then the annual distributional impact of the PBS will differ from the fortnightly impact shown here.

The results suggested that the PBS is highly progressive, with PBS benefits declining from 6 per cent of the disposable income of the poorest 20 per cent of Australians to 0.3 per cent of the income of the most affluent 20 per cent. The average weekly PBS subsidy declined from $8.70 for the poorest 20 per cent to $1.60 for the most affluent 20 per cent. As a result, two-fifths of total PBS outlays were directed at the poorest one-fifth of Australians.

There were also pronounced distributional effects by age and gender, with older Australians receiving far greater PBS benefits than younger Australians and women receiving higher benefits on average than men. An estimated 11 per cent of total PBS outlays were directed towards women aged 75 years and over.

Couples without children received 47 per cent of total PBS outlays, reflecting the significance of older retirees. Single people received one-third of total PBS outlays, sole parent families 9.2 per cent and couple with children families 17.3 per cent. There were also pronounced effects over the life cycle, with average government subsidies rising with age and, in retirement in particular, with the sharp increase in the proportion of the population eligible for PBS concession cards.

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