A Carrot and a Big Stick:

Understanding Private Health Insurance and Older Australians

Research Monograph No.1, October 2011

National Seniors Australia
Productive Ageing Centre

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INTRODUCTION

Healthy and productive ageing rests considerably upon timely and affordable access to health care. In the near future, expenditure on health care is expected to rise as population ageing places heavier demands on the public health care system. The Federal Treasury projects government expenditure on health care on those aged 65 and over is to increase seven-fold from 2010 to 2050 – and 12-fold for the over 85 age group over the same period (Commonwealth Treasury, 2010). To alleviate pressure from the public health care system, from the late 1990s the then Howard government introduced key reforms to the private health insurance sector, which sought to encourage Australians of all ages to purchase private health insurance.

These reforms are colloquially referred to as 'carrots' and 'sticks': those that provide incentives to purchase, and disincentives not to purchase, private health insurance. This intervention was considered necessary because over time there had been an ongoing decrease in the number of younger, healthier persons with health insurance relative to older persons and those with more complex needs – a process health economists term as an adverse selection spiral (Barret and Conlon, 2003). Since the implementation of these reforms, there has been an increase in the proportion of the Australian population covered by private health insurance from 32 per cent in 1997 to 45 per cent in 2011 (PHIAC, 2011a).

In the context of these ongoing reforms, it is important to understand changes in the numbers and proportions of older Australians that are insured, as they represent a population that is particularly pre-disposed to requiring surgery, hospital care and other health services. Knowledge of health insurance coverage of older persons is also important because international studies have shown those who lack appropriate insurance coverage are at greater risk of disability, are unable to access necessary drugs, pay high out-of-pocket health care expenses and are less likely to seek health care services (Landerman, Fillenbaum, et al., 1998; Federman, Adams, et al., 2001; Rogowski, Lillard, et al., 1997; Angel, Angel, et al., 2002). In Australia, private health insurance plays a different role than in other Organisation for Economic Development (OECD) countries, as the private health insurance market operates concurrently with the publically funded Medicare system.

Nonetheless, key advantages offered to older persons who are privately insured include shorter waiting times for surgical care, access to high technology treatments, access to private hospital rooms and better access to dentistry and ancillary services (Leeder, 2003; Stoelwinder, 2002; O'Hara and Brook, 1996; Buchmueller, 2007).

Surprisingly, only a handful of studies have examined the coverage of older Australians with private health insurance. Using 2001 data from the National Health Survey, Temple (2004a) found those with low levels of economic resources, those living alone or with low levels of education were less likely to hold health insurance. In another study, tracking health insurance coverage of older persons from 1997 to 2002, it was found that although health insurance coverage among persons aged 55 and over had increased over this period, it did so most rapidly among younger members of this age group (Temple, 2006a). Other research also suggests that the

continuation of Lifetime Health Cover has the potential to preclude older uninsured people from purchasing health insurance because of affordability concerns, notwithstanding the increase in the 30% rebate for Australians aged over 65 (Temple, 2004b). Research on the broader Australian community also shows that factors measuring levels of risk aversion of individuals is also associated with the decision to purchase health insurance, in addition to a range of demographic and economic factors (Barret and Conlon, 2003; Industry Commission, 1997).

This report seeks to update earlier studies by answering the following questions in the context of the most recent reforms:

- What proportion and number of Australians aged over 50 are covered by private health insurance and how has this changed over a period of significant reform (1997 to 2011)?
- What are the reasons that older Australians give for purchasing or not purchasing private health insurance?
- What are the characteristics of older Australians with and without cover, and are there differences in the type of coverage?

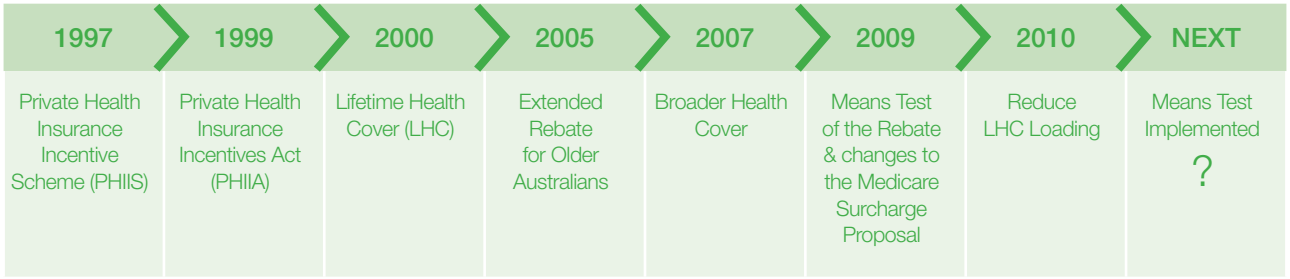
Thus, the purpose of this paper is not to suggest policy prescriptions, but rather describe the patterns of health insurance purchase amongst older Australians in a recent period of considerable policy change.

POLICY REFORMS — CARROTS & STICKS

Although some policies have changed with time, the key components of these reforms remain today; particularly through the Medicare Surcharge (stick), Private Health Insurance Rebate (carrot), Lifetime Health Cover (big stick) and the Extended Private Health Insurance Rebate for Older Australians (carrot).

A growing number of studies have examined the effectiveness of these reforms in increasing the health insurance coverage of the Australian population and reducing pressure on the public hospital sector (for a comprehensive overview see Hindle and McAuley, 2004). Some argue that Lifetime Health Cover was the major policy increasing insurance coverage in the Australia population (Butler, 2002; Walker, Percival, et al., 2005). Uncertainty surrounds the relative effects of the rebate and the Medicare Surcharge, mainly due to the short period of time in which they were implemented, as shown in Figure 1 (Schneider, 2002; Quinn, 2002). Furthermore, some have also questioned the ability of the reforms to take pressure off public hospitals as any Australian citizen can admit themselves as a private or Medicare patient in a hospital at the point of patient election, regardless of health insurance status (Temple, 2006b).

Figure 1: Timeline of Private Health Insurance Policy Changes



Details of these reforms are described below:

- **1997** Medicare Surcharge: Introduced as part of the Private Health Insurance Incentive Scheme (PHIIS), individuals and couples above certain income thresholds were required to pay an additional 1% in tax, called the Medicare Levy Surcharge, if they did not purchase a Complying Health Insurance Product (CHIP). This levy is in addition to the 1.5% Medicare levy. As of the 2009-10 Financial Year (FY), the income thresholds are $73,000 for individuals and $146,000 for couples. From the 2009-10 FY, reportable employer superannuation contributions and total net investment losses are also included in the income test in some cases.

- **1999** Private Health Insurance Rebate: From 1999, the 30% Private Health Insurance Rebate was introduced (as part of PHIIA). This provides a subsidy of 30% of the cost of an individual's or family's private health insurance premiums. The rebate is not means tested. The rebate can be paid directly by the private health insurer or can be received by the insurance purchaser as a tax-rebate at the end of the financial year or as a direct payment from Medicare.

- **2000** Lifetime Health Cover (LHC): The Howard government introduced LHC to encourage a mix of younger and older persons, and higher and lower risk members, in the private health insurance market. This policy relaxed the age component of community rating by offering lower premiums to people who purchased health insurance before turning 31. For persons aged over 30 who did not purchase health insurance, the Lifetime Health Cover age (previously known as 'certified age of entry') was used to calculate a surcharge. The surcharge was calculated as (Lifetime Health Cover age – 30 x 2% x base rate) where base rate is the base premium amount excluding the rebate. For example, a 40 year old would pay a surcharge of 20% on their health insurance premiums (40 – 30 x 2). If this same person waited until age 50 to purchase health insurance, the surcharge would be 40% (see Table below).The maximum surcharge is 70% at age 65.

Lifetime Health Cover Age	LHC loading %
31	2
41	22
45	30
50	40
65	70

Source: Calculations by authors.

In a narrow one year window between July 1999 and July 2000, an amnesty was declared where people of any age could purchase health insurance and lock in a Lifetime Health Cover age of 30 – that is, pay no surcharge. Persons born before July 1934 are exempt from the LHC loading; that is aged 66 in 2000 (aged 77 in 2011).

- **2005** Extended Private Health Insurance Rebate: As part of the 2004 election campaign, the Howard government proposed that the 30% insurance rebate be increased to 35% for persons aged 65-69, and to 40% for persons aged over 70.

- **2007** Broader Health Coverage: As part of broader health coverage, the traditional lines between ancillary coverage (those services generally provided out of hospital) and hospital only coverage were slightly relaxed. Since the change, General Treatment insurance has allowed for some in-hospital services to be offered out of hospital which was previously not permitted under the legislation. For example, health funds may design a product to allow an older person with cancer to receive chemotherapy in or out of hospital. Formally, the legislation enables coverage of Hospital-substitute treatment and coverage through the chronic disease management program. The 'risk equalisation' scheme was also introduced (replacing the existing re-insurance system), which subsidised health insurance funds with riskier than average populations.

- **2009** Means Test for the Rebate: in the 2009-10 Budget, the Rudd Government proposed means testing the 30% rebate (and subsequent extended rebate for older

Australians) and also changing the operation of the Medicare Levy Surcharge (see Table 1). For singles with a taxable income under $75,001 and families with an income under $150,000 the system remains the same. As income rises into the next group (up to $90,000 for singles and $180,000 for couples) the rebate drops by 10% for all three age groups. A further 10% drop occurs as income rises to $120,000 for singles and $240,000 for couples. For income above this amount the rebate (including the older persons rebate) is not available. For Tiers 2 and 3, the Medicare Levy Surcharge also increases by .25% between each tier if the taxpayer does not purchase private health insurance.

Table 1: Proposed Means Test of Private Health Insurance Rebate, 2010-11.

	Current surcharge thresholds (projected 2010–11)	**Tier 1**	**Tier 2**	**Tier 3**
Singles	$0 - $75,000	$75,001 - $90,000	$90,001 - $120,000	$120,001+
Families	$0 - $150,000	$150,001 - $180,000	$180,001 - $240,000	$240,001+
Medicare Levy surcharge	nil	1.00%	1.25%	1.5%
Private Health Insurance rebate				
Under 65	30%	20%	10%	nil
65 to 69 years	35%	25%	15%	nil
70 years or over	40%	30%	20%	nil

Source: 'Part 2: Expense measures', Budget Measures: Budget Paper No. 2: 2009–10, p. 311.

- **2010** Reduced Lifetime Health Cover Loading: From July 2010, for those paying the LHC surcharge, the loading is removed after ten continuous years of paying the surcharge.

- **2011** The Gillard government will require the support of the Independents in the Lower House and Greens in the Upper House to pass the means tested rebate. As of September 2011, this legislation has not passed.

DATA

Data for this study are from administrative data provided by the PHIAC and from the 2007/08 National Health Survey (NHS) conducted by the ABS (2010). PHIAC collects quarterly data on the number of persons with private health insurance, by age and sex. Insurance is classified as hospital, general treatment (or ancillary) and ambulatory coverage (PHIAC, 2011a). Further (unpublished) data were provided from PHIAC displaying the Lifetime Health Cover age from 2000 to the present (PHIAC, 2011b). Herein, we present data for persons covered by a CHIP. These data are combined with estimated resident population (ERP) figures from the ABS to calculate the proportions of the population by age and sex covered by a CHIP from 1997 to 2010.

The ABS NHS data were used to complement the administrative data. The NHS was conducted between August 2007 and June 2008 across all states and territories to provide a nationally-representative picture of the health and well-being of all Australians. Trained ABS interviewers conducted personal interviews with the respondents, eliciting information on private health insurance coverage, and the reasons for purchase or non-purchase of insurance, as well as a wide range of measures of the demographic and economic composition of the household.

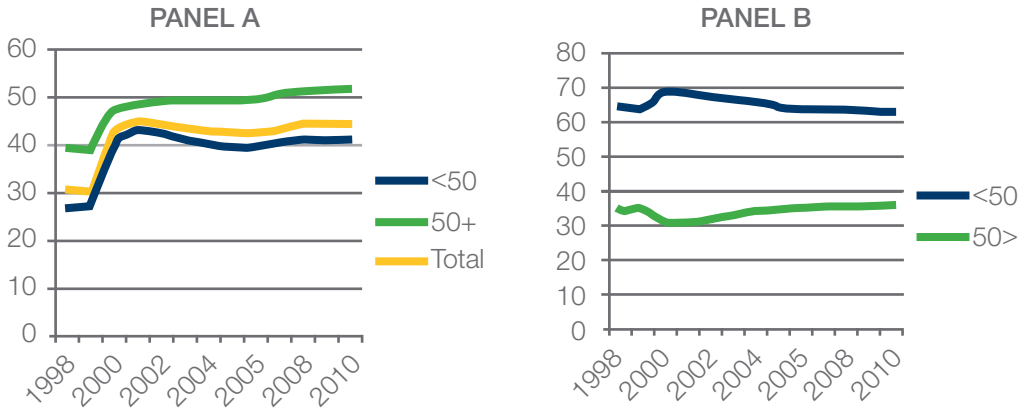
RESULTS

1. Coverage across time

Results in Figure 2 display the considerable change in health insurance coverage from the late 1990s to present. Panel A shows that, from June 1998, coverage increased from 30% to 43% in 2000, when Lifetime Health Cover was introduced. For those aged under 50, coverage initially increased faster than for those aged 50 and over (under 50s: 27% in 1998 to 41% in 2000; 50 and over: 40% in 1998 to 48% in 2000). By 2010, 41% of under 50s and 52% of the 50 and over age group had hospital insurance.

Panel B in Figure 2 displays the change in the age structure of the population covered by health insurance. Initially, the under 50s share of the health insurance market increased from just under 65% in 1998 to reach just under 69% in 2000-01. Since this time, there has been a gradual decline in the proportion of the total health insurance market that is made up of the under 50s, to under 64%, just below the level at the beginning of the reform process.

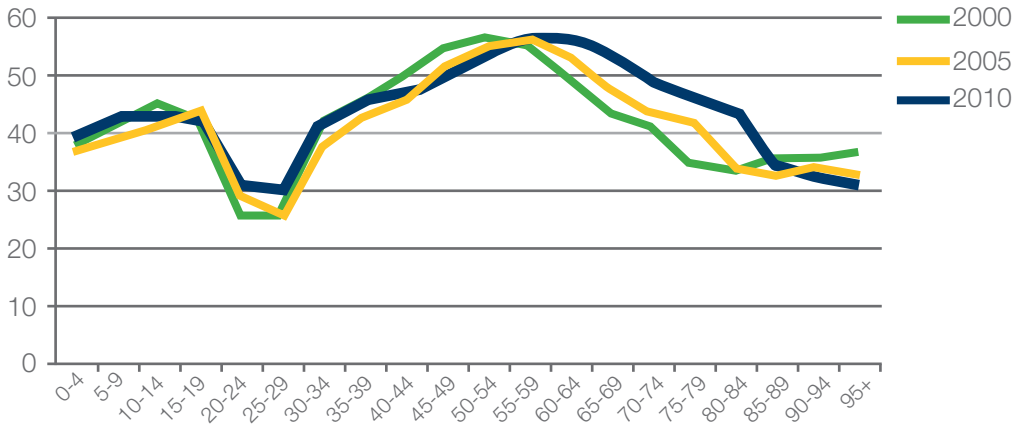
Figure 2: Hospital Coverage (%) 1997 – 2010, Persons aged <50 and >50 (Panel A) and Age Composition of Hospital Coverage (%) for each Age Group (Panel B).



Source: Authors' calculations from PHIAC 2011a.

The graphs in Figure 2, however, mask the great degree of heterogeneity in health insurance coverage by single years of age. Figure 3 displays the change in insurance coverage over time by age group at three points in time: 2000 at the introduction of Lifetime Health Cover; 2005 at the introduction of the extended health insurance rebate for older Australians and 2010 (the latest June data at time of publication). These data show that those aged 55–79 in 2005 and 2010 have higher levels of health insurance coverage than in 2000 at the introduction of Lifetime Health Cover. For the oldest age groups, over 80, coverage is slightly lower in 2010 compared to earlier years.

Figure 3: Hospital Coverage by Age and Sex (PHIAC)



Source: Authors' calculations from PHIAC 2011a.

The previous figures emphasise the changes in health insurance coverage that occur at each age over time. That is, they are not following the health insurance coverage of specific groups of people as they age (i.e., a cohort of people).

The table in Box 1 tracks the health insurance coverage of a cohort of people across time. The analysis is by five year increments as single year of age data is not available from PHIAC. For example, persons aged 50-54 in 2010 had coverage about 3 percentage points higher than 10 years ago when they were aged 40-44. Interestingly, for all cohorts aged 50 and over today, the difference in private health insurance coverage over the past five years has only fluctuated in a narrow 4 percentage point band. Indeed, 6 of the 10 oldest cohorts experienced no change or a slight reduction in coverage over the previous 10 years.

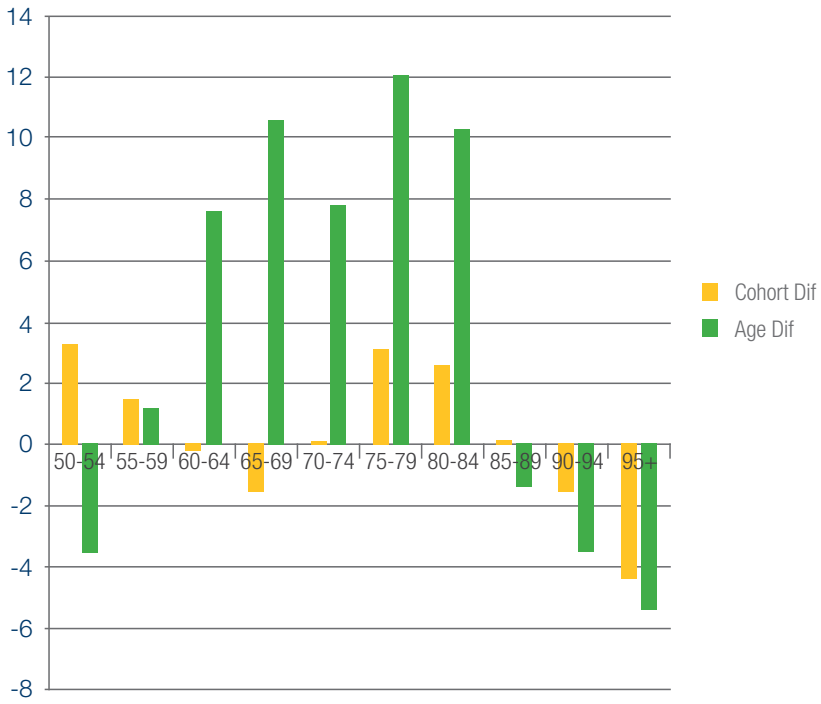
The results from the cohort analysis differ markedly from the age analysis displayed in Figure 2 (showing significant health insurance uptake in the 55-79 age group with a slight decline thereafter). The graph in Box 1 illustrates the age and cohort differences in health insurance coverage. The green bars show the percentage change in health insurance coverage between 2000 (at the start of Lifetime Health Cover) and 2010 by age. For example, coverage for 50-54 year olds is about 3.5 percentage points lower today than for 50-54 year olds in 2000. Similarly, all ages over 84 also experienced declines. Conversely, there has been an increase in health insurance coverage for persons aged 55-84, with double digit growth for those aged 65-69, 75-79 and 80-84 years.

The cohort differences (the yellow bars) in coverage are much smaller. For example, those aged 65-69 in 2010 have actually slightly decreased their overall level of coverage, rather than increased it. Taking another example, the cohort aged 90-94 in 2010 have actually decreased their coverage by 2% since 2000, when aged 80-84. For all cohorts the change is less than 4 percentage points. Not surprisingly, a different story is observed for the younger groups. For the age group within 10 years of age 30 (the cut-off age for Lifetime Health Cover), cohort growth is very significant. For example, the cohort aged 35-39 in 2010 has overall insurance coverage that is 19 percent higher than 10 years previous when aged 25-29 (and not subject to Lifetime Health Cover).

Box 1: Cohort Difference in Health Insurance Coverage, 2000 – 2010.

2010 Age	2005 Age	2000 Age	2010%	2005%	2000%	10 Year Change
20-24	15-19	10-14	31	44	45	-14
25-29	20-24	15-19	30	29	42	-12
30-34	25-29	20-24	42	26	26	17
35-39	30-34	25-29	469	38	26	19
40-44	35-39	30-34	47	43	42	5
45-49	40-44	35-39	50	46	46	4
50-54	45-49	40-44	53	52	50	3
55-59	50-54	45-49	57	55	55	1
60-64	55-59	50-54	57	57	57	0
65-69	60-64	55-59	54	54	55	-2
70-74	65-69	60-64	49	48	49	0
75-79	70-74	65-69	46	44	43	3
80-84	75-79	70-74	44	42	41	3
85-89	80-84	75-79	34	34	34	0
90-94	85-89	80-84	32	33	34	-2
95+	90-94	85-89	31	34	36	-4

Change in private health insurance coverage (in percentage points) from 2000 to 2010 for each age group and for each age cohort (by age in 2010)



Source: Authors' calculations from PHIAC 2011a.

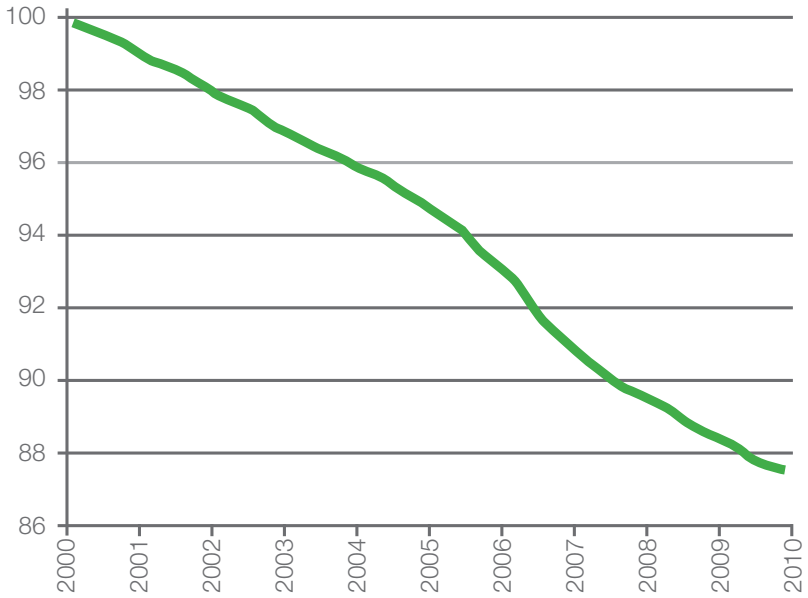
Note: For cohort analysis (yellow line) the difference is measured as coverage in 2010 compared with 2000 when they were 10 years younger (ie, those aged 50-54 in 2010 were 40-44 in 2000). For age analysis (green line) the difference is measured as coverage in 2010 compared with 2000 by age (ie, those aged 50-54 in 2010 compared with those aged 50-54 in 2000).

2. Coverage by age for the purposes of lifetime health cover

The above data have tracked the purchase of health insurance across time by the age of the insurance purchaser. For the purposes of the Lifetime Health Cover policy, we can also examine the Lifetime Health Cover age for those purchasing health insurance since this policy's implementation in 2000. That is, the Lifetime Health Cover age used to calculate the level of the surcharge applied.

Figure 4 below displays the percentage of persons paying no Lifetime Health Cover surcharge. Those not paying the Lifetime Health Cover surcharge include those with an age at entry of less than 31 and those born before 1934. It also includes those who held insurance prior to 2000 and remained covered through the amnesty period (July 1999 to July 2000). From the policy's inception in 2000, the proportion paying any surcharge has increased significantly to about 13 per cent of the insured population.

Figure 4: Proportions Paying No Lifetime Health Cover Surcharge, 2000-2010

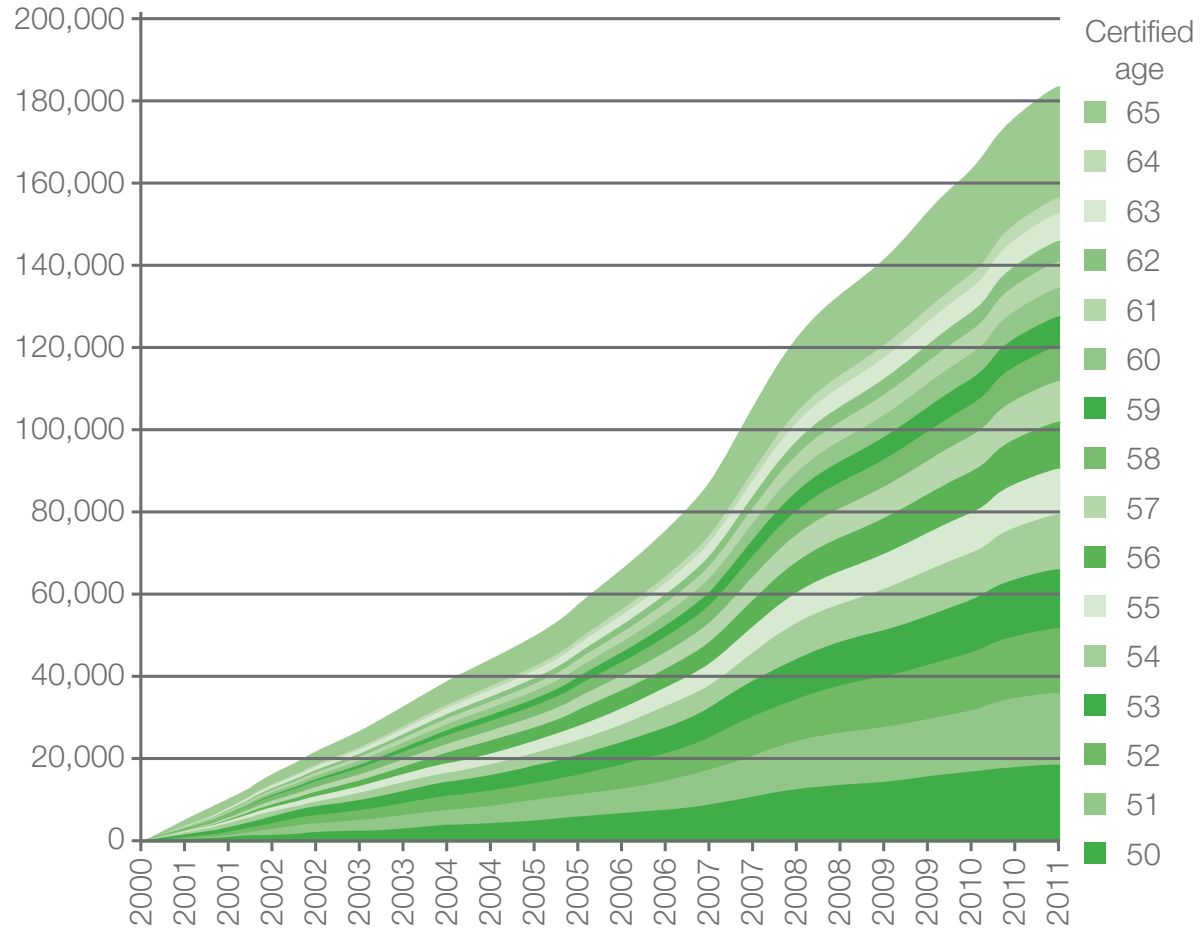


Source: Authors' calculation from PHIAC 2011b.

Of those paying the surcharge, the PHIAC administrative data do not enable an analysis of the total number of persons aged 50 and over paying the surcharge. However, it is possible to isolate the number of persons aged 50 and over paying a surcharge between 40% (Lifetime Health Cover age = 50) and the maximum 70% (Lifetime Health Cover age of 65). These data, therefore, do not include the over 50s paying a surcharge of less than 40%.

It is clear from these data that there has been a significant increase in the numbers of over 50s paying a surcharge of 40% or more. In 2011, just over 180,000 persons are paying this level of surcharge. It is apparent also that the increase in the numbers paying the surcharge has not been proportional. The numbers paying the full 70% surcharge (i.e., a Lifetime Health Cover age of 65) has increased much faster than those paying a lesser surcharge (Figure 5).

Figure 5: Numbers of Persons with a Lifetime Health Cover age of 50 or more (i.e., paying a 40% Surcharge or More), 2000-2011



Note: A person must be aged 50 or more to have a Lifetime Health Cover age of 50 or more.

Source: PHIAC, 2011b.

The rapid proportional increase of those paying the maximum surcharge can be explained by the exclusion of those born before June 1934 from Lifetime Health Cover. In the future, we can expect much larger proportions of persons paying the maximum surcharge as younger cohorts age and become subject to the Lifetime Health Cover rules. This point is illustrated in Table 2 below. In 2010, persons aged between 65 and 75 are subject to the maximum surcharge, whereas in 2025 persons between ages 65 and 90 purchasing private health insurance for the first time since 2000 are subject to the maximum surcharge. The cohorts that will be subject to the maximum surcharge in the near term are part of the large "baby boomer" generation.

Table 2: Cohort Flow and Lifetime Health Cover

Year born	Age	2010 Surcharge (%)	Age	2015 Surcharge (%)	Age	2020 Surcharge (%)	Age	2025 Surcharge (%)
1934	76	n.a	81	n.a	86	n.a	91	n.a
1935	75	70	80	70	85	70	90	70
1940	70	70	75	70	80	70	85	70
1945	65	70	70	70	75	70	80	70
1950	60	60	65	70	70	70	75	70
1955	55	50	60	60	65	70	70	70
1960	50	40	55	50	60	60	65	70
1965	45	30	50	40	55	50	60	60

Note: n.a. All persons born prior to June 1934 are exempt from Lifetime Health Cover.

Source: Authors' calculations.

3. Characteristics of those with and without private health insurance

The above analysis has shown the changes in private health insurance coverage over time have differed far more between cohorts rather than within cohorts. A key question is then posed: among the older population itself, what other characteristics differentiate those with and without private health insurance? Previous studies of the broader Australian community have shown that constellations of demographic, economic and health factors are all associated with the decision to purchase or not purchase insurance (Industry Commission, 1997).

Who purchases private health insurance?

Table 3 below examines the demographic characteristics of the uninsured and the insured by type of insurance purchased – by age, marital status (and gender), place of birth, education and region of residence. Type of insurance is disaggregated by no insurance, hospital insurance, ancillary health insurance (also referred to as General Treatment insurance and comprehensive insurance (both hospital and ancillary). Of these categories, only hospital and comprehensive insurance are considered to be a CHIP and subject to the existing legislation.

The proportion of over 50s covered by health insurance declines with age, supporting findings from the administrative data. Furthermore, marital status appears to be strongly associated with the decision to purchase any form of health insurance; unmarried males and females are significantly less likely to purchase any form of insurance when compared to their married peers. Differences are also shown in the level of education of purchasers. About 52 per cent of those with post-school education have a combined hospital and general treatment package, compared with just 36 per cent of those without this level of

education. Those from a Non-English Speaking Background (NESB) are also more likely to have no insurance when compared to the Australian-born, or migrants from an English speaking background. Finally, those who live outside of major cities or inner regional areas are less likely to purchase health insurance.

Table 3: Demographic Characteristics of Whether Purchased Private Health Insurance, by Type of Insurance (%), People Aged 50 years and over, 2008

		Type of private health insurance %			
	No Insurance	Hospital	Ancillary	Combined	Total
Age					
50-59	38	8	4	50	100
60-69	40	10	3	46	100
70-79	49	11	2	37	100
80+	61	12	2	25	100
Marital Status					
Married male	36	11	4	50	100
Married female	32	12	3	53	100
Unmarried male	61	7	2	30	100
Unmarried female	52	8	4	36	100
Place of Birth					
Australia	42	10	3	46	100
ESB	45	9	5	41	100
NESB	50	12	3	36	100
Education					
<Post School Education	52	9	3	36	100
Post School Education	34	10	3	52	100
Region of Residence					
Major CIty	40	11	3	46	100
Inner Regional	47	10	3	40	100
Other	56	6	4	35	100

Source: ABS National Health Survey, 2008.

Note: ESB: English speaking background, NESB: Non-English speaking background.

Apart from these key demographic factors, economic variables are shown to differentiate the type of health insurance purchase (Table 4). These data show a clear increase in health insurance coverage with higher income. Almost 70 per cent of those in the bottom 20 per cent of the income distribution hold no private health insurance, compared with just 12 per cent of the top income earners. Studies of the broader Australian community show that holding a Health Care Card is strongly associated with the decision not to purchase private health insurance (Wilson, 1999; Schofield, 1997; Hopkins and Kidd, 1996). Results here strongly support this; 58 per cent of those with a concession card do not hold private

health insurance, compared with just 26 per cent of those with a card. Those outside of the labour market and persons on pensions exhibit particularly strong patterns of non-purchase, perhaps reflective of both an income effect and concession card effect.

Table 4: Economic Characteristics of Whether Purchased Private Health Insurance, or Type of Insurance (%), People Aged 50 years and over, 2008.

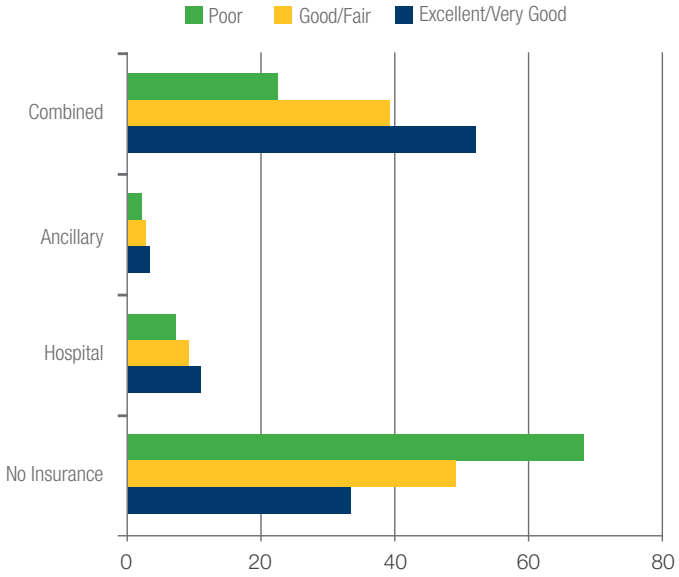
	Type of private health insurance %				
	No Insurance	Hospital	Ancillary	Combined	Total
Income Source					
Wage/salaries	30	10	5	56	100
Govt pensions/allow-ances	67	8	3	22	100
Other	26	12	2	59	100
Equivalent Household Income*					
<20%	68	7	3	22	100
20-40	52	10	4	34	100
40-60	37	9	4	50	100
60-80	27	11	4	58	100
80-100	12	12	2	74	100
Missing	36	12	3	49	100
Labour Force Status					
Employed	30	9	4	56	100
Unemployed/NILF	53	10	3	34	100
Concession Card					
Has Card	58	10	3	30	100
No Card	26	10	4	61	100

Source: ABS National Health Survey, 2008.

Notes: NILF: Those not in the labour force. * Household income adjusted by the OECD equivalence scale and grouped into quintiles.

Finally, health status appears to be a key factor differentiating the purchase of health insurance. Importantly, those who report to be in poor health are far less likely to hold private health insurance when compared with those who report "good/fair" or "excellent/very good" health. The correlation between income, poor health and affordability is an important one.

Figure 6: Insurance Coverage (no coverage, basic hospital, comprehensive) by Health Status (%), 2008



Source: ABS National Health Survey, 2008

Vignettes

Clearly, these data paint a complex picture of the characteristics of those purchasing insurance. Importantly, these simple descriptive data do not enable a disaggregation of the relative role of each factor in predicting the probability of coverage. To examine how these key demographic and economic variables shape older persons' decisions about health insurance purchase, we utilise regression techniques to investigate the probabilities of purchase for three examples of older Australians below. Please see the technical appendix for an overview of the methodology and estimated parameter coefficients. Table 5 displays the predicted probabilities.

a) Lucy

Lucy met Peter 40 years ago when they were both studying at university. Lucy and Peter's kids have recently left home after graduating. Both have busy careers and have worked in the financial sector for many years. They are both in very good health – just visiting their family GP for an annual check-up. Although they are in their early 60s, they still enjoy their careers and look forward to a few more years in the workforce. They live in the city and are considering moving to the beach in about 10 years time. With Lucy's circumstances, she is about 75 per cent likely to purchase a comprehensive insurance product, 19 per cent likely to hold a hospital only product and just 7 per cent likely to have no insurance.

b) Phyllis

Phyllis is in her 80s and is very active in her community, volunteering for Meals on Wheels and a number of community organisations. She has been a widow for 15 years and finds she benefits a lot from the social support offered through volunteering. For the last few years her health has been poor – but because she is on the full age pension, she has access to the pensioner's concession card. She lives in the country and because of her health has had to travel to a larger regional centre for treatment. Using Phyllis's characteristics, she is about 87 per cent likely to have no private health insurance, 4 per cent likely to hold a hospital only product and 9 per cent likely to have comprehensive insurance.

c) Mario and Sylvia

Mario and Sylvia moved to Australia from Italy in the 1960s when they were just 20. After working hard their entire lives, they are enjoying retirement. Because they made the decision early on to put money away for a rainy day, Mario and Sylvia's primary source of income is from superannuation and savings – albeit a modest amount. They are 60 per cent likely to have comprehensive health insurance, 21 per cent likely to have hospital only insurance and 19 per cent likely to have not purchased any insurance at all.

Table 5: Probability* of Holding No Insurance, Hospital Only or Comprehensive Insurance.

	Pr (No Insurance)	Pr(Hospital Only)	Pr(Comprehensive)
Lucy & Peter	0.07 (0.05, 0.09)	0.19 (0.13, 0.25)	0.75 (0.68, 0.81)
Phyllis	0.87 (0.84, 0.91)	0.04 (0.02, 0.05)	0.09 (0.07, 0.12)
Mario & Sylvia	0.19 (0.15, 0.23)	0.21 (0.15, 0.28)	0.06 (0.53, 0.67)

* Predicted probabilities from a multinomial logistic model. 95% confidence intervals in parentheses. See appendix for further details.

4. Reasons for Purchase or non-purchase

As noted earlier, unlike many OECD countries, all Australian citizens are guaranteed free accommodation and treatment in public hospitals through Medicare. Given that older Australians have this 'fall-back' position, why are older Australians purchasing health insurance at all? Tables 6 and 7 present results from the 2008 ABS NHS, which asked respondents why they purchased health insurance. Respondents could select more than one option.

As shown in Table 6, there is considerable variation in the reasons given for purchasing health insurance across the age groups. Importantly, those aged over 50 are about twice as likely to list "Security/Protection or peace of mind" when compared with persons aged under 50. Indeed 60% of insurance holders aged over 80 list this reason. Indeed this finding is not unexpected – the purpose of health insurance is to "provide a risk protection mechanism against uncertain health care expenses" (Butler and Sidorenko, 2007).

Apart from this reason, choice of doctor, treatment as a private patient in hospital and skipping the public hospital waiting list are all key reasons given by older Australians as to why they purchase insurance. Unsurprisingly, with increasing age, older Australians are also more likely to report "Elderly or getting older or likely to need treatment" as a reason for purchase (rising from 9 per cent of respondents aged 50-59 to 30 per cent of respondents aged 80+).

Table 6: Reasons for Purchase of Private Health Insurance by Age Group (%), 2008.

	<50	50-59	60-69	70-79	80+
Security or protection or peace of mind	27	53	54	56	60
Lifetime cover or avoid age surcharge	6	12	10	10	7
Choice of doctor	12	34	32	32	31
Allow treatment as private patient in hospital	14	31	31	33	31
Provides benefits for ancillary services or extras	15	28	22	19	17
Shorter wait for treatment or concerned over public hospital waiting lists	12	30	34	33	32
Always had it or parents pay it or condition of job	12	18	20	24	18
To gain government benefits or avoid extra Medicare levy	9	9	6	1	2
Other financial reasons	3	4	4	3	3
Has condition that requires treatment	4	8	11	8	12
Elderly or getting older or likely to need treatment	1	9	17	25	30
Other reason	4	3	3	2	3

Source: 2008 ABS National Health Survey

Importantly, the benefits gained from insurance also differ based upon the type of health insurance held. As shown in Table 7, older persons with Hospital only or Combined policies are more likely than those on General Treatment policies to report security, choice of doctor, treatment as a private patient, shorter waiting lists or getting older as reasons for purchase. Those on General Treatment policies are more likely to report access to ancillary services.

Table 7: Reasons for Purchase of Private Health Insurance By Insurance Type (%), Persons Aged 50+.

	Hospital	General*	Combined
Security or protection or peace of mind	50	25	57
Lifetime cover or avoid age surcharge	10	2	11
Choice of doctor	27	4	36
Allow treatment as private patient in hospital	32	2	34
Provides benefits for ancillary services or extras	1	72	25
Shorter wait for treatment or concerned over public hospital waiting lists	35	2	33
Always had it or parents pay it or condition of job	13	3	23
To gain government benefits or avoid extra Medicare levy	8	1	6
Other financial reasons	3	3	4
Has condition that requires treatment	7	3	10
Elderly or getting older or likely to need treatment	16	6	17
Other reason	3	5	3
N	687	223	3028

Source: 2008 ABS National Health Survey; * Also referred to as Ancillary insurance

Regardless of age, affordability is the key reason persons of any age do not purchase health insurance (Table 8). About 59 per cent of persons aged under 50 and about 65 per cent aged 50-79 cite “Cannot afford it/too expensive” as the reason for not purchasing health insurance. For the oldest age group (80+), only 43 per cent cite affordability. The reason is the very high proportion of persons in this age group who have access to a Pensioners Concession Card of Veterans Affairs Card. Indeed, 43 per cent of the those over 80 report access to the concession card as a reason for not purchasing health insurance –the equal most popular reason along with affordability concerns deterring purchase. Across the full population, between 15 and 20 per cent of persons see Medicare as sufficient and therefore not requiring purchase of health insurance.

Table 8: Reasons for Not Purchasing Private Health Insurance, (By Age Group).

	<50	50-59	60-69	70-79	80+
Cannot afford it/too expensive	59	65	68	65	43
High risk category	0	2	1	1	0
Lack of value for money/not worth it	12	15	11	7	6
Medicare cover sufficient	16	16	15	19	17
Do not need medical care/in good health/have no dependants	11	9	7	8	5
Will not pay Medicare levy and private health insurance premium	2	4	2	2	0
Disillusionment about having to pay out of pocket costs/gap fees	3	6	5	4	1
Prepared to pay cost of private treatment from own resources	2	3	2	1	1
Pensioner/Veteran's Affairs/health concession card	2	5	11	22	43
Not high priority/previously included in parents' cover	13	5	2	1	2
Other	9	5	3	3	4

Source: 2008 ABS National Health Survey

Clearly, affordability is the main barrier to older Australians (indeed Australians of all ages) accessing health insurance. It is important to understand the variation in the characteristics of persons reporting this problem – key differences may suggest inequity in access to timely care. Specifically, those with health insurance report skipping the public hospital queue, choice of doctor and treatment as a private patient in a public hospital as the key advantages of private health insurance.

Table 9 below displays the socio-economic characteristics of older uninsured Australians who report affordability as a problem, compared to those who do not. The key message from this table is that there is a general high level of prevalence of reporting an affordability problem across all demographic and economic groups. Among the economic and demographic groups with slightly higher affordability problems are:

- persons on pensions and allowances or those with a concession card
- lower income earners
- persons from a Non-English Speaking background
- persons with no post-school education

Health factors also appear to be associated with the prevalence of affordability problems. Of those aged 50 and over who report being in poor health, 74 per cent state affordability as the key barrier, compared with 64 per cent of those in good or fair health and 56 per cent of those in good or very good health.

Table 9: % Reporting Affordability as a Reason for Not Purchasing Insurance, by Demographic Characteristics.

	% Reporting		% Reporting
Age		**Country of Birth**	
50-59	65	Australia	60
60-69	68	ESB	64
70-79	65	NESB	70
80+	43	**Concession Card**	
Marital Status		Has Card	65
Married Male	60	No Card	54
Married Female	67	**Region of Residence**	
Unmarried Male	60	Major city	63
Unmarried Female	64	Inner regional	63
Income Source		Other	61
Wage/Salaries	59	**Education**	
Govt/Pensions/Allowances	68	Has Post-School Education	58
Other	49	No Post-School Education	65
Equivalent Income		**Self Rated Health**	
<20%	74	Excellent/Very Good	56
20-40	58	Good/Fair	64
40-60	59	Poor	74
60-80	47	**Employment Status**	
80-100	38	Employed	60
Missing	51	Unemployed/NILF	64

Source: ABS National Health Survey, 2008

To again isolate the relative effects of an individual's characteristics on reporting affordability problems, further regression models are fitted (see technical appendix). Using these results, we estimate probabilities of reporting affordability problems for the vignettes outlined earlier (Table 10). Assuming the characters in our vignette do not hold health insurance, Phyllis has the highest probability of reporting an affordability problem (about 63 per cent), followed by Mario and Sylvia (33 per cent) and finally Lucy and Peter (11 per cent).

Table 10: Predicted Probability* of Affordability Problem, 2008.

	Pr (Affordability Problem)
Lucy & Peter	0.11 (0.06, 0.16)
Phyllis	0.63 (0.54, 0.72)
Mario & Sylvia	0.33 (0.23, 0.43)

Notes: * Predicted probabilities from a multinomial logistic regression model. 95% confidence intervals in parentheses. See appendix for further details.

DISCUSSION

Holding comprehensive health insurance confers key advantages to older Australians, including shorter waiting times for surgical care, better access to high technology treatments and choice between doctors (Temple, 2004b). Given these key advantages, this study has sought to understand the prevalence of private health insurance coverage and also the characteristics of those older Australians who have been unable or unwilling to purchase private health insurance. This study has offered the following key findings:

5. Levels of Coverage

An early evaluation study in 2003, concluded that Lifetime Health Cover had encouraged greater numbers of younger people to purchase health insurance and that incentives existed to encourage them to remain covered throughout life (Hancock and Neal 2003). This was thought to lower the average age of the insurance pool – offsetting the degree of adverse selection that was occurring in the market at this point in time. However, findings from this study show that the age structure of the insurance pool has reverted to that before the reforms. This is not due to younger people dropping out or more older people buying health insurance. It is due to, firstly, cohort flow – i.e., the ageing of the current 50 plus population, and secondly the fact that the newer cohorts of the over 50 population are subject to the surcharges under Lifetime Health Cover. Regardless of this increase in the average age of members, the cohort statistics indicate remarkable stability in the level of health insurance coverage. These cohort statistics present further detail about recent changes to private health insurance coverage beyond that shown by the age based statistics which describe a significant increase in the proportion of older persons with private health insurance.

Combining the age and cohort analyses, the basic conclusions are that:

- 40% of the over 50 population were covered by health insurance in 1998 at the start of the reforms, increasing to 48% in 2000 at the introduction of Lifetime Health Cover and 52% more recently in 2010.

- Newer cohorts of older people in 2010 are more likely to hold health insurance compared with previous cohorts in 2000 at the same age, but;

- There is less change in coverage of health insurance within cohorts across time. In particular, there was very little take up of health insurance among specific cohorts of people – indeed 6 of the 10 cohorts examined here experienced zero or slightly negative growth in health insurance coverage from 2000 to 2010.

- Ten year uptake has been much stronger for younger Australians, particularly within ten years of age 30, the Lifetime Health Cover age.

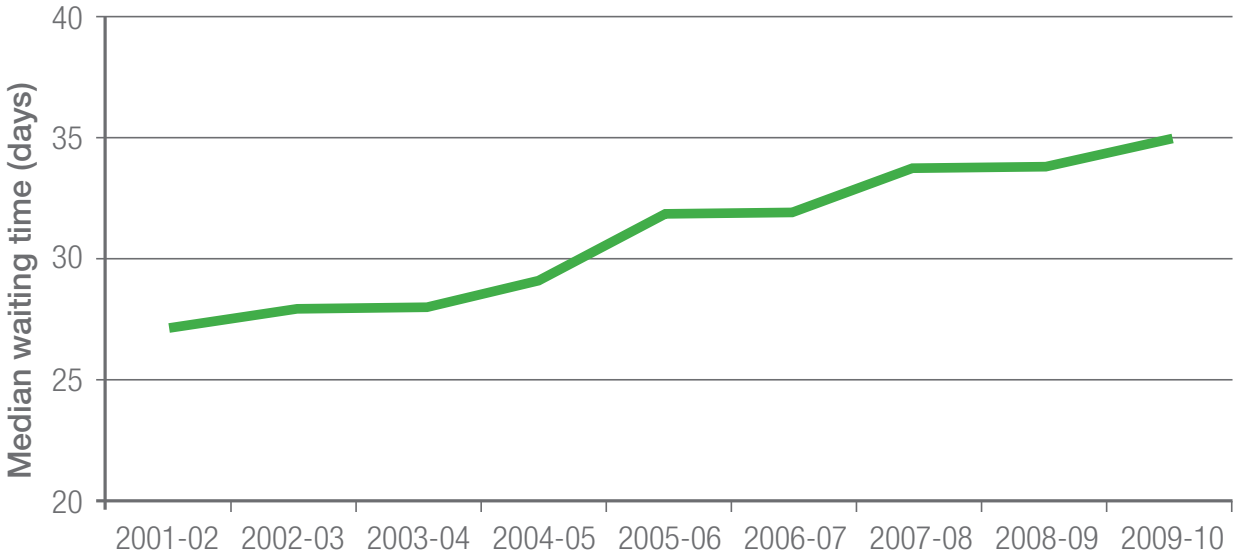
- An examination of Lifetime Health Cover age also shows a substantial increase in the number of over 50s paying a surcharge of between 40% and the maximum 70% surcharge; about 180,000 persons. A considerable number are likely to be paying a lesser surcharge of between 2% and 40%, but unfortunately, the administrative data do not allow this analysis.

6. Reasons for purchase

Results from this study indicate a number of key reasons that older Australians report for purchasing health insurance. Key among the reasons for purchase was security/peace of mind, choice of doctor and treatment as a private patient in a public hospital.

An additional key reason for holding private health insurance for those with hospital or combined insurance was "shorter wait for treatment or concerned over public health waiting lists" – with over 30 per cent of the over 50s citing this reason for purchasing insurance. Indeed, recent data from the Australian Institute of Health and Welfare (AIHW) measuring waiting times for elective surgery in public hospitals demonstrate the difficulties faced by patients in the public health system. Of particular importance is that the timeliness of public elective surgery has diminished in the past decade. Data from the AIHW National Elective Surgery Waiting Times Data Collection show that the median waiting time for public elective surgery in Australia in 2009-10 was 35 days, an increase from 27 days in 2001-02 (see Figure 7). Ten per cent of patients waited for over 246 days for their elective surgery in 2009-10, an increase from 203 days in 2001-02. Hospital waiting times can also be measured in terms of the proportion experiencing extended waits based on the urgency of their condition. In Western Australia, Tasmania and the ACT, 32% of all patients experienced an extended wait, compared with 14% in NSW and 15% in both Queensland and Victoria (Productivity Commission, 2009).

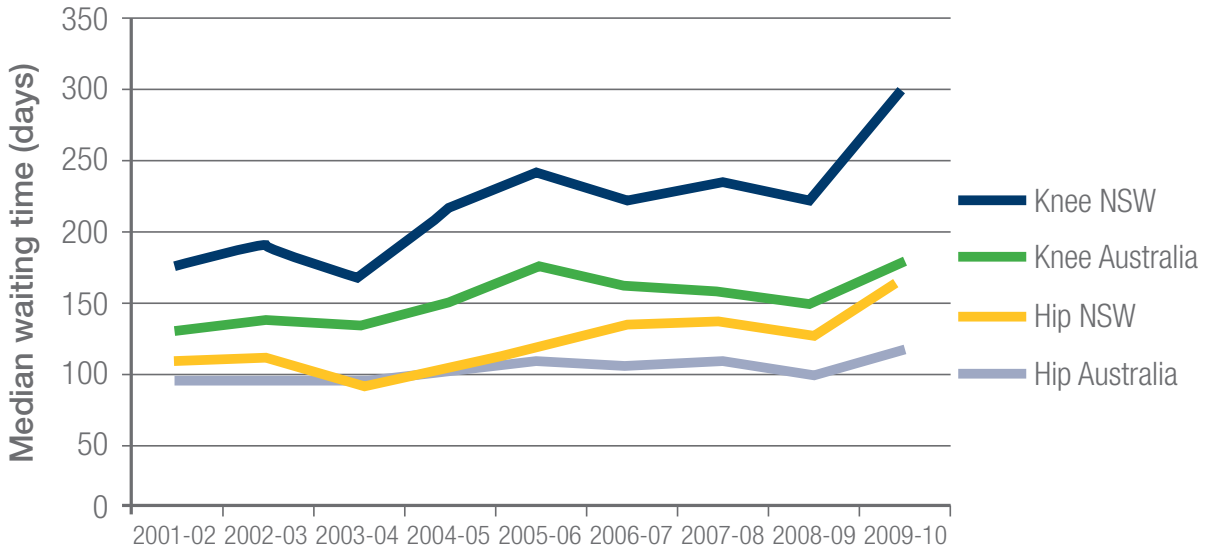
Figure 7: Median Waiting Time (days) for Patients Admitted from Waiting Lists for Public Elective Surgery, Australia, 2001-02 to 2008-09



Source: AIHW, 2011.

Waiting times also differ considerably by jurisdiction. For example, the median number of days waited for elective surgery ranged from 73 days in the ACT, to 44 days in both New South Wales and the Northern Territory and 27 days in Queensland. 10% of patients in the ACT waited for more than 357 days (18% waited more than one year), while in Tasmania it was 332 days and in NSW 330 days (AIHW, 2011). Waiting times are also particularly high for some procedures, including total knee replacement (median wait of 180 days, 18% waited more than one year), total hip replacement (median wait 116 days, 11% waiting more than one year), and cataract extraction (median wait 86 days, 10% waited more than 11 months) (AIHW, 2011). In Tasmania and NSW, waiting lists for knee and hip replacements are exceptionally high. Half of all patients in Tasmania requiring total knee replacement waited more than 431 days or approximately 14 months and half needing a total hip replacement waited 291 days or almost 10 months. In NSW, waiting times for hip and knee replacements worsened over the past decade from 2001-02, at a rate faster than in all Australia (see Figure 8). Also in NSW, the median waiting time for a cataract extraction was 211 days, compared to just 37 days in Queensland.

Figure 8: Median Waiting Time (days) for Total Knee Replacement and Total Hip Replacement for Patients Admitted from Waiting Lists for Public Elective Surgery, NSW and Australia, 2001-02 to 2008-09



Source: AIHW, 2011.

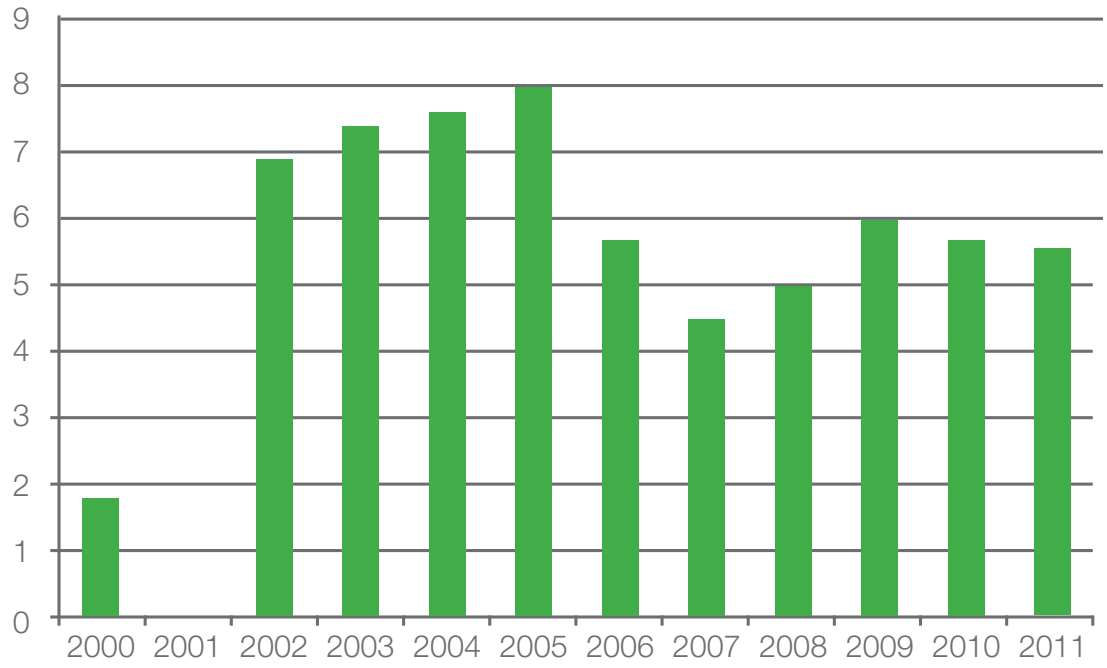
These statistics indicate the problems many people, of any age, have in accessing specific elective surgical procedures. The health insurance industry argues that the means test of the health insurance rebate will encourage people to drop out of health insurance – with the dual repercussions of an increase in premiums for those who remain covered, and further pressure being placed on public hospitals, which will lead to greater waiting times (Deloitte, 2011) . In response to the problems with waiting times for some procedures, the Prime Minister has announced a national health reform deal with the states which will see major reforms to the public hospital system to the tune of $175 billion. The Prime Minister has announced that this will directly lead to a drop in waiting times (AAP, 2011).

7. Reasons for non-purchase

This study has also uncovered the key reasons why older Australians without health insurance do not purchase it. Less than 20% of over 50s reported “lack of value for money” or “Medicare cover sufficient”. Relatively high proportions (about 40%) of the over 80s reported that a concession card provided adequate coverage. However, the key reason of the possible 11 responses given for not purchasing insurance was “Cannot afford it / too expensive”. Although the prevalence of reporting affordability problems was high across all types of older families (around 60 percent reporting), particular demographic groups had slightly higher patterns of reporting affordability difficulties. These groups included lower income earners, persons on pensions and allowances, persons from a NESB and those with no post-school education.

For many older Australians on fixed incomes, health insurance is simply not achievable within their household budget. This problem is oftentimes compounded by the rate of premium increase over time. For the past three years, premiums have been growing at just under 6% per annum, well above Consumer Price Index growth for the same period (Figure 9 below). Indeed, with the exception of the two years following the introduction of Lifetime Health Cover, insurance premium growth has outstripped CPI growth.

Figure 9: Annual Private Health Insurance Premium Increases (%), 2000-2011.



Source: Biggs, 2009; Department of Health and Ageing, 2010; Department of Health and Ageing, 2011.

There is also no silver bullet solution to constraining premium growth – with a complex mix of cost pressures on health insurers. Among the recent pressures include: (i) payments to the risk equalisation pool, (ii) increasing costs consistent with population ageing, (iii) maintaining long term viability – particularly related to prudential standards and benefit outlays, (iv) adverse selection, and; (v) technological costs associated with new treatments (Biggs, 2009; Department of Health and Ageing 2011).

Affordability of health insurance into advanced old age is also of particular concern in the context of Lifetime Health Cover. For example, a person born in 1935 is required to continue paying premiums until death if they desire to avoid the Lifetime Health Cover surcharge. Given that many older persons are on fixed incomes, and are subject to the diseconomies of scale that occur with widowhood, health insurance simply may not be affordable over such a long period of time. Indeed, the government's own Industry Commission (1997) inquiry into health insurance hypothesised that low income and widowhood explain why insurance coverage of those aged over 65 is lower than the overall population.

Interestingly, very few older Australians with health insurance specifically state government policies as the key reason for purchasing insurance. About 11 per cent of persons over 50 reported Lifetime Health Cover and only 6 per cent reported to gain government benefits or to avoid the extra Medicare levy as a reason for purchase. These relatively small proportions are interesting in that government policies can significantly affect those without insurance in accessing health insurance. A potential reason is the poor level of community awareness of Lifetime Health Cover. A 2011 survey of 2,000 Australians aged 18-64 found that although only 9 per cent of the population were unaware of the health insurance rebate or the Medicare Surcharge, a massive 41 per cent of respondents were unaware of Lifetime health Cover (ANOP, 2011). Indeed, Lifetime Health Cover can be a significant impost on older Australians without health insurance wishing to purchase it for the first time since 2000.

Given that persons born after 1934 are subject to the 2% Lifetime Health Cover surcharge, the health insurance coverage of current and future cohorts of the aged is of concern. Of those older persons who did not purchase health insurance, almost 60% of respondents cited that they could not afford to. All persons aged between 65 and 75 in 2011 who purchase health insurance for the first time are subject to the maximum 70% surcharge. By 2015, all persons aged between 65 and 80 and who choose to purchase health insurance for the first time will be subject to a maximum 70% surcharge and by 2020, this age range extends to 85. Of course, the level of surcharge incurred depends upon health insurance purchasing behaviour earlier in the life course. For example, if a person aged 45 cannot afford health insurance and remains uncovered to age 60, this person is subject to a 60% annual surcharge upon their health insurance premiums. To reduce the 60% surcharge back to zero, the person is required to hold a complying hospital insurance policy for a minimum of ten continuous years.

Indeed, affordability is such a significant issue for older Australians who do not hold health insurance that the extended rebate is relegated to “small carrot” status, when compared to the “very big stick” that is the Lifetime Health Cover surcharge for those who currently do not hold insurance.

8. Characteristics of purchasers.

Finally, this study has provided information on the characteristics of those who purchase and those who do not purchase health insurance. Firstly, economic factors appear strongly associated with health insurance purchasing decisions in later life. This is not surprising, given that the most significant reason given for not purchasing health insurance is affordability concerns. Those with higher incomes, with attachment to the labour market, or with non-benefit income sources have particularly high prevalence rates for coverage.

Persons without access to a concession card also have high levels of coverage. This result mainly reflects the combination of Medicare and Health Care Card concessions acting as a partial substitute for private health insurance in Australia. Although it may also measure an income effect (as access to concession cards in Australia is heavily means tested), the regression results indicate that once controlling for economic resources, concession card holders are still more likely to hold no insurance. This same group of older Australians are more likely to report

affordability as a key barrier of access to health insurance, when compared to those who do not hold a concession card. This points to the importance of maintaining key indexing features to the concession card – those who just miss out on the concession card may face significant affordability barriers in accessing private health insurance in Australia.

Previous studies have included demographic factors measuring the knowledge of the relative merits of the private and public health care systems (Hopkins and Kidd, 1996; Schofield, 1997). Typically, proxy measures of this have included education, country of birth and language proficiency. For example, migrants from a NESB background may lack sufficient English language proficiency skills to mediate the complex health insurance policies. Similarly, older Australians with very low education may face a similar barrier in comparing the relative merits of the public and private systems. Consistent with these previous studies, we find that older Australians from a NESB background have a lower level of health insurance coverage when compared to the Australian born or those from an English Speaking Language background.

Unmarried persons, whether male or female, are also less likely to hold any form of insurance when compared to their married peers. Initially, one may suspect this is due to economies of scale and the general lower levels of economic wellbeing of many older persons living alone. However, in the regression analysis, being unmarried was still associated with non-purchase, even with extensive controls for economic resources available in the household. A potential reason for this finding is that having a spouse (or other dependant) in the household raises the overall level of risk aversion of the household (Hopkins and Kidd, 1996). That is, older persons with a spouse are more likely to purchase health insurance to offset the risk of unexpected health expenses.

CONCLUDING COMMENTS

9. What We Know

This study has sought to document the private health insurance coverage of older Australians during the last 13 years of very rapid policy change. In brief, this report has offered the following findings:

- Newer cohorts of older Australians are more likely to hold health insurance when compared with older cohorts. However, there is remarkable stability in health insurance coverage as specific cohorts age.
- Under Lifetime Health Cover, there has been a rapid increase in the number of over 50s paying a surcharge of between 40 per cent and 70 percent on their private health insurance policies – now numbering 180,000 people in 2011. A very narrow window was given to buy into insurance and avoid the surcharge – and has essentially locked many older Australians out of buying health insurance. In the future, this figure will increase as the post 1934 cohort (those subject to the legislation) reach advanced age whilst replaced by younger cohorts.
- Many older Australians answer that one main reason to have health insurance is to skip the public hospital queue. This is not a surprising finding, given the data presented here show a worsening of waiting lists for selected surgical procedures.
- Of those without health insurance, 60% of older persons cite affordability as the key barrier to purchasing insurance. Driven in part by the Lifetime Health Cover surcharge, affordability concerns are also being driven by the speed of increase in premium growth, which has remained above general CPI growth.
- Importantly, there is a socio-economic gradient for those at risk of affordability problems – being more likely to be receiving the pension, from a NESB and with low levels of educational attainment.

10. What We Need to know

Importantly, in the current debate surrounding the means testing of the rebate, there is disagreement on the effect of means testing the rebate. The few studies on the effect of the rebate reach very different conclusions. Treasury estimates suggest 25,000 people will drop health insurance as a result of means testing of the rebate. They contend that due to the higher thresholds through the Medicare Levy Surcharge, fewer people will drop out than with changes to the surcharge (Community Affairs Legislation Committee, 2009). The Department of Health and Ageing have suggested a net change of 40,000 – consisting of 25,000 persons dropping their hospital and/or general treatment cover, a further 10,000 downgrading their coverage and 5000 persons with General Treatment policies only who would drop these policies (Community Affairs Legislation Committee, 2009). In contrast, a report prepared for the Australian Health

Insurance Association by Deloitte, estimates approximately 1.6 million people will drop their cover, and a further 4.3 million will downgrade their cover over a five year period (Deloitte, 2011). They further estimate a flow on effect to a rise in all premiums of about 10 percentage points above what would otherwise be the case without the means tested rebate. Furthermore, with additional pressure on the public hospital system, they estimate an increase in average waiting times for select procedures. Clearly, with only a few studies examining the effect of the change in stark opposition, further detailed evidence is required to inform the way forward – particularly given the high levels of problems with affordability as reported in this paper.

Apart from these research priorities, further analysis is warranted to examine the use of private health insurance at the point of patient election. When older Australians are admitted to hospitals and are given a patient election form, they can choose to admit themselves as either a private patient (using health insurance or self-insurance to fund admission) or a public patient (using Medicare). An analysis of this decision making process would provide important information on the health insurance usage of older Australians, when oftentimes a free publically provided alternative is available. Secondly, additional research on the full catalogue of benefits paid by health insurance companies would provide further information on the advantages of insurance accrued by older individuals themselves. This is of particular importance in the context of the recently implemented risk equalisation scheme, replacing the existing reinsurance system in 2007.

In addition to these specific research priorities, our understanding of older Australians' use of health insurance could be boosted significantly by improved data collection and linkages. Specifically:

- An appropriate data collection and linkage program by PHIAC to examine the numbers of older persons subject to any surcharge through Lifetime Health Cover. This would involve linking the Lifetime Health Cover age to an individual's actual age. Currently, PHIAC are unable to provide such data. This would uncover the number of the over 50s paying a surcharge of between 2% and 40%. The current data set has allowed us to estimate that about 180,000 older Australians are paying a surcharge of between 40% and the maximum 70%.

- An appropriate data linkage program by AIHW to examine waiting times by characteristics of the patient, and not just broad tabulations. This would enable an analysis of the waiting times experienced by older Australians relative to other groups. These data are currently not available.

- The National Health Survey currently includes a module on reasons for purchase and non-purchase of health insurance. For the non-purchasers, the role of the Medicare levy in deciding against purchase is asked, but not that of other policies, in particular the Lifetime Health Cover Surcharge. As shown from the analysis herein, the Lifetime Health Cover Surcharge acts as a major barrier to the affordability of health insurance

for many older uninsured persons. Hence, a question regarding the role of the Lifetime Health Cover Surcharge as a reason for not purchasing private health insurance should be included in future cross-sections of this survey.

Study in the areas outlined above would provide further evidence to that provided herein on the health insurance purchasing and usage behaviour of older Australians; a topic of ongoing relevance in the context of inextricable population ageing and the implications for public and private health care financing.

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TECHNICAL APPENDIX

A.1 Regression Models of Health Insurance Membership & Affordability Problems

The Multinomial Logit model is used to estimate the following linear in logs equation:

$$\ln \Omega_{i/n} = \ln \frac{\Pr(y = i \mid x)}{\Pr(y = n \mid x)} = x\beta_{i|n} \qquad i = 1,2$$

Where:

i=1 hospital insurance

i=2 Comprehensive health insurance

n is the comparison category, holding no health insurance.

x is a vector of independent variables

β is a vector of coefficients

The raw MNL coefficients are transformed to estimate the Relative Risk Ratio (RRR):

$$RRR = \frac{\Omega_{m|n}(x, x_k + \delta)}{\Omega_{m|n}(x, x_k)} = e^{\beta_{k,m|n}\delta}$$

Setting $\delta = 1$, the RRR is interpreted as: for a one unit change in an independent variable x_k, the odds of purchasing basic hospital insurance (i=1) relative to no health insurance are expected to change by $\exp(\beta_{k,i|n})$ with all other factors held constant.

With the full set of equations estimated, I also perform simulations of the probability of holding no health insurance, basic hospital insurance or comprehensive health insurance as follows:

$$\Pr(y = i \mid x) = \frac{\exp(x\beta_{i|n})}{\sum_{j=1}^{J} \exp(x\beta_{j|n})}$$

95% confidence intervals for the predicted probability of belonging to each health insurance state are than calculated via the Delta method using analytical derivatives (Long and Freese, 2005). Predicted probabilities of perceived affordability problems are generated in a similar manner.

A.2 Testing the Validity of a Trichotomous Model of Health Insurance Purchase

To test the validity of the trichotomous model of health insurance, I address two questions: Firstly, are the insurance purchase decisions of older Australians statistically independent, and; secondly, is it preferable to model the insurance purchase decision as a dichotomous, rather

than trichotomous choice? The first question corresponds to tests of the 'Independence of Irrelevant Alternatives' (IIA), while the latter pertains to tests of 'Indistinguishability' (Long and Freese, 2005).

A.2.1 Tests of the Independence of Irrelevant Alternatives (IIA)

The Multinomial Logit imposes the strong restriction of the IIA. This implies that the health insurance purchase decision (no insurance, basic hospital or comprehensive) is statistically independent of any other alternative. More specifically, adding another alternative, or changing the characteristics of an endogenous alternative does not affect the odds of choosing alternative states in the model (Wooldridge, 2002:501).

Formally, given the alternatives (1) hospital insurance and (2) comprehensive cover, the IIA assumption forces the probability ratio:

$$\frac{P\{y_i = 2\}}{P\{y_i = 1\}} = \exp\{x_{i2}'\beta\}$$

irrespective of any other insurance alternative (Verbeek, 2000:196)

To test the IIA assumption, I follow the procedures developed by Hausman and McFadden (1984) and Small and Hsiao (1985).

Hausman and McFadden's (1984) approach involves estimating (1) a multinomial logit model with all insurance alternatives (full-model) and (2) a multinomial logit model with one alternative removed (restricted-model). Hausman's procedure then tests that there is no systematic change in the coefficients between the full and restricted models. The test statistic given by Hausman and McFadden's (1984) test of the IIA is:

$$H = (\hat{\beta}_R - \hat{\beta}_F^*)'\{\hat{V}ar(\hat{\beta}_R^*) - \hat{V}ar(\hat{\beta}_F^*)\}^{-1}(\hat{\beta}_R - \hat{\beta}_F^*)$$

Given:

$\hat{\beta}_F$ are the full-model estimates

$\hat{\beta}_R$ are the restricted model estimates (I.e. one insurance alternative omitted)

$\hat{\beta}_F^*$ is a subset of $\hat{\beta}_F$ after eliminating coefficients not included in the restricted model

I validate the Hausman and McFadden test with the Small and Hsiao (1985) test. Small and Hsiao's test of the IIA assumption involves firstly drawing two random samples from the survey population. From each sample, restricted and unrestricted multinomial logit models are estimated, and the associated parameter coefficients stored. The test statistic (Long, 1997), for Small and Hsiao's (1985) IIA test is:

$$SH = -2\{L(\beta_u^{S_1 S_2}) - L(\hat{\beta}_r^{S_2})\}$$

Given:

$\hat{\beta}_u^{S_1 S_2} = \left(\frac{1}{\sqrt{2}}\right)\hat{\beta}_u^{S_a S_2} + \left\{1 - \left(\frac{1}{\sqrt{2}}\right)\right\}\hat{\beta}_u^{S_2}$ is the weighted average of coefficients

$\hat{\beta}_u^{S_1}$ estimates form unrestricted model, sample 1.

$\hat{\beta}_u^{S_2}$ estimates from unrestricted model, sample 2.

$\hat{\beta}_r^{S_1}$ estimates form restricted model, sample 1.

$\hat{\beta}_r^{S_2}$ estimates from restricted model, sample 2.

If both tests are upheld, the hypothesis that the health insurance decision of older Australians is statistically independent is accepted. This provides evidence that modelling the no insurance, basic insurance, comprehensive insurance decision process is not affected by adding or changing this choice set.

A.2.2 Tests of Indistinguishability

This second set of tests addresses the validity of a trichotomous versus a dichotomous model of health insurance demand.

Building upon Anderson's (1984) stereotype ordinal regression model, Long (1997) proposed two separate tests for 'indistinguishability'. In the context of ordered ordinal models, Anderson provides a test for collapsing categories of the dependent variable based upon a set of covariates having a statistically different effect across the alternate categories. Given a statistically different effect, the hypothesis of indistiguishability is rejected. In the case of no statistically different effect, the hypothesis of indistinguishability is accepted and categories of the dependent variable must be collapsed.

Long (1997) generalizes these tests of indistinguishability to the unordered ordinal regression models. This enables a test for collapsing categories in the dependent variable for the Multinomial Logit model. For the trichotomous health insurance purchasing model, the effect of collapsing (1) basic and comprehensive (2) basic and no cover and (3) comprehensive and no cover into one category is examined. Of course, the first of these combinations is of theoretical as well as methodological interest.

Formally, I test the hypothesis:

$$H_0 : \beta_{1,c|b} = \ldots = \beta_{K,c|b} = 0$$

Where:

$\beta_1 \ldots \beta_K$ are the variables hypothesized to influence the health insurance decision

c is comprehensive insurance

b is hospital cover.

This hypothesis can be tested via a Wald test, with the test statistic:

$$W_{c|b} = [Q\hat{\beta}^*]'[QV\hat{a}r(\hat{\beta}^*)Q']^{-}[Q\hat{\beta}^*]$$

Where:

β^* are the parameter estimates

Q applies the constraint that all covariates are jointly zero.

Long (1997) also proposes a simpler Likelihood Ratio (LR) test. The procedure involves firstly creating a subset of comprehensive and basic insurance categories, then estimating a binary logit on the subsample, and testing that all coefficients (with the exception of the constant term) are simultaneously zero. If the LR test accepts the hypothesis, than the categories are indistinguishable, and categories of the dependent variable must be collapsed. This procedure is utilised for all possible combinations of the dependent variable.

A.3 Regression Results – Insurance Purchase

Variables in the model †	Group 1			Group 2		
	RRR	SE	z	RRR	SE	z
_lage_1	2.48	0.33	6.81***	2.04	0.18	8.07***
_lage_2	3.49	0.57	7.62***	2.59	0.28	8.68***
_lage_3	3.53	0.65	6.83***	1.72	0.22	4.20***
_lmar_1	1.46	0.18	3.14***	1.41	0.12	4.00***
_lmar_2	0.45	0.07	-5.48***	0.39	0.04	-9.72***
_lmar_3	0.70	0.09	-2.87***	0.84	0.07	-2.08**
_lincsourc~1	0.63	0.12	-2.49**	0.54	0.07	-4.98***
_lincsourc~2	1.60	0.23	3.22***	1.81	0.18	6.03***
_lequiv_1	1.31	0.18	2.03**	1.37	0.12	3.50***
_lequiv_2	1.32	0.23	1.57ns	1.73	0.20	4.83***
_lequiv_3	2.60	0.51	4.82***	2.71	0.36	7.47***
_lequiv_4	5.93	1.26	8.40***	7.20	1.08	13.10***
_lequiv_9	1.44	0.27	1.94*	1.44	0.18	2.91***
_lcob_1	0.72	0.10	-2.46**	0.70	0.06	-3.98***
_lcob_2	0.96	0.11	-0.36ns	0.68	0.06	-4.58***
_lcard_1	1.47	0.22	2.53**	1.98	0.20	6.60***
_lregion_1	0.80	0.09	-1.97*	0.84	0.06	-2.31**
_lregion_2	0.47	0.08	-4.55***	0.68	0.07	-4.01***
_lnonschoo~1	1.24	0.12	2.20**	1.33	0.09	4.40***
_lhealth_1	0.72	0.07	-3.43***	0.79	0.05	-3.66***
_lhealth_2	0.52	0.10	-3.48***	0.49	0.06	-5.61***

Notes: ns (not significant) ; * (0.1<P<0.05) ; ** (0.05<p<0.01) ; *** (p<0.01); † Appendix table for variable definition.

Hausman Tests of the IIA assumption

Omitted	Chi2	df	p>chi2	evidence
1	15.834	22	0.824	for Ho
2	15.850	22	0.907	for Ho

Small-Hsiao Tests of the IIA Assumption

Omitted	lnL(full)	lnL(omit)	Chi2	df	p>chi2	evidence
1	-1539.580	-1529.180	22.800	22	0.533	for Ho
2	-716.781	-705.362	22.838	22	0.411	for Ho

Wald tests for Combining Alternatives

Alternatives tested	Chi2	df	p>chi2
1 - 2	103.19	21	0.000
1 - 0	452.53	21	0.000
2 - 0	1269.91	21	0.000

Likelihood Ratio tests for Combining Alternatives

Alternatives tested	Chi2	df	p>chi2
1 - 2	102.85	21	0.000
1 - 0	509.67	21	0.000
2 - 0	1823.69	21	0.000

A.4 Regression Results – Affordability Problems

Variables in the model †	Group 1			Group 2		
	RRR	SE	z	RRR	SE	z
_lage_1	2.84	0.43	6.86***	1.29	0.15	2.16**
_lage_2	4.51	0.83	8.18***	1.82	0.25	4.40***
_lage_3	6.98	1.46	9.29***	4.68	0.69	10.56***
_lmar_1	1.40	0.19	2.41**	0.80	0.10	-1.82*
_lmar_2	0.48	0.08	-4.45***	1.06	0.12	0.51ns
_lmar_3	0.68	0.09	-2.77**	0.84	0.09	-1.53ns
_lincsourc~1	0.77	0.17	-1.24ns	1.33	0.24	1.57ns
_lincsourc~2	2.48	0.43	5.19***	2.02	0.31	4.58***
_lequiv_1	1.75	0.25	3.94***	2.07	0.22	6.98***
_lequiv_2	1.75	0.34	2.91***	2.13	0.33	4.93***
_lequiv_3	4.96	1.13	7.06***	4.07	0.80	7.18***
_lequiv_4	12.96	3.38	9.82***	5.20	1.27	6.76***
_lequiv_9	1.84	0.38	2.93***	2.26	0.38	4.83***
_lcob_1	0.62	0.09	-3.14***	0.79	0.09	-2.05**
_lcob_2	0.80	0.11	-1.68*	0.68	0.08	-3.46***
_lcard_1	1.74	0.31	3.07***	1.47	0.23	2.45**
_lregion_1	0.79	0.10	-1.88*	0.96	0.09	-0.39ns
_lregion_2	0.47	0.08	-4.20***	1.17	0.13	1.32ns
_lnonschoo~1	1.32	0.14	2.60**	1.14	0.10	1.54ns
_lhealth_1	0.65	0.07	-3.92***	0.81	0.07	-2.39**
_lhealth_2	0.41	0.08	-4.49***	0.54	0.08	-4.28***

Notes: ns (not significant) ; * (0.1<P<0.05) ; ** (0.05<p<0.01) ; *** (p<0.01); † Appendix table for variable definition.

Hausman Tests of the IIA assumption

Omitted	Chi2	df	p>chi2	evidence
0	0.309	22	1.000	for Ho
1	16.467	22	0.792	for Ho

Small-Hsiao Tests of the IIA assumption

Omitted	lnL(full)	lnL(omit)	Chi2	df	p>chi2	evidence
0	-897.164	-884.925	24.479	22	0.323	for Ho
1	-593.761	-585.632	16.258	22	0.803	for Ho

Wald tests for Combining Alternatives

Alternatives tested	Chi2	df	p>chi2
0 - 1	221.691	21	0.000
0 - 2	478.516	21	0.000
1 - 2	321.384	21	0.000

Likelihood Ratio Tests for Combining Alternatives

Alternatives tested	Chi2	df	p>chi2
0 - 1	259.968	21	0.000
0 - 2	637.920	21	0.000
1 - 2	369.738	21	0.000

Variable Definitions

Variable Name	Variable Definition
_lage_1	Aged 60-69
_lage_2	Aged 70-79
_lage_3	Aged 80+
_lmar_1	Married Female
_lmar_2	Unmarried Male
_lmar_3	Unmarried Female
_lincsourc~1	Pensions
_lincsourc~2	Other (Business income, other income)
_lequiv_1	20-40% of distribution of equivalent (OECD) household income
_lequiv_2	40-60% of distribution of equivalent (OECD) household income
_lequiv_3	60-80% of distribution of equivalent (OECD) household income
_lequiv_4	80-100% of distribution of equivalent (OECD) household income
_lequiv_9	Missing Income Indicator
_lcob_1	English Speaking Background
_lcob_2	Non-English Speaking Background
_lcard_1	Holds a Concession Card
_lregion_1	Inner Regional
_lregion_2	Other Areas
_lnonschoo~1	Holds post-school qualification
_lhealth_1	Good or Fair
_lhealth_2	Poor

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