

Public policy and private health insurance: distributional impact on public and private hospital usage

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Abstract

Objective: To study the effectiveness of recent private health insurance (PHI) reforms, in particular the 30% rebate and Lifetime Health Cover, in terms of their stated aim of reducing the load on public hospitals.

Methods: Combines the use of two new projection models — “Private Health Insurance” (PHI) and “New South Wales Hospitals” that use public and private hospital inpatient data from 1996–97 to 1999–2000, and NSW population and private health insurance coverage statistics.

Results: With the PHI reforms 15% fewer individuals would use public hospitals in 2010 than without these reforms (around 18% fewer among the 40% most affluent Australians and 9% among the 40% least affluent). Lower public hospital usage would mainly be due to Lifetime Health Cover.

Conclusion: If the PHI reforms remain in place, in 2010 a significant proportion of hospital use would be redirected away from the public sector and towards the private sector, with the shift being greatest among better-off Australians.

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What is known about the topic?

Studies have arrived at conflicting results in relation to the impact of the private health insurance policy initiatives (30% rebate and Lifetime Health Cover) on public hospital utilisation.

What does this paper add?

The two modelling techniques used suggest that the reforms, in particular the Lifetime Health Cover, would lead to a 15% reduction in NSW public hospital utilisation by 2010.

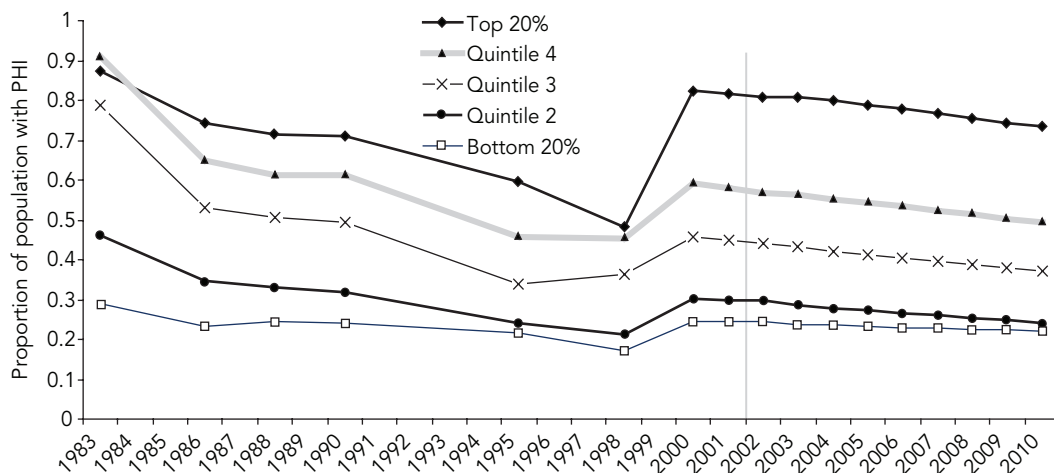
What are the implications for practitioners?

This study suggests that Lifetime Health Cover will assist in meeting the government aim of reducing the load on public hospitals.

IN RECENT DECADES the health of the population in developed countries improved dramatically, but the related public health expenditures outpaced economic growth. This forced governments to contain costs (largely in the hospital sector), to find new funds or to pass a larger share of the costs on to individuals.^{1,2} This latter approach is the aim of the Australian federal government's policies to increase the take-up of private health insurance — that is, the 30% private health insurance (PHI) rebate, Lifetime Health Cover and the Medicare Levy Surcharge. A recent Senate inquiry noted that two of the rebate's objectives were to make PHI more affordable and to reduce the load on public hospitals,³ but concluded that there were insufficient analyses on whether the new PHI policies had achieved this latter aim.

The paper reports on the current and projected impact of the new PHI policies on public hospital utilisation in NSW, linking two new analytical tools: the “Private Health Insurance Model” and the “NSW Hospitals Model”. Because Australians with higher incomes are more likely to have hospital insurance, the impact of the new PHI policies on groups with different socioeconomic status (SES) was also studied.

I Proportion of Australians with private health insurance (PHI), by socioeconomic status — historical data 1993–2002; projections 2002–2010



The 30% rebate applied from 1 Jan 1999 and Lifetime Health Cover from 1 Jul 2000.

Sources: from 1983 to 2002: ABS Health Insurance Surveys (for years 1983, 1986, 1988, 1990, 1992, 1998) and ABS National Health Surveys (1995, 2001); from 2003: projections with the PHI model.

The PHI model and scenarios

The Private Health Insurance Model is a projection model based on Australian Bureau of Statistics (ABS) surveys. The model and the simulated scenarios are described in an earlier publication.⁴ Briefly, the model uses logistic regression to estimate the probability of a person having private health insurance. Predictive variables are: age, sex, year (as number of years from 1983), premium costs (as a proportion of average household disposable income) and, to account for SES, gross income quintiles (at income unit level).

As shown in Box 1, simulations with current policies indicated that it was the most affluent group, that is the 20% of the NSW population with highest incomes, that was most responsive to the new PHI policies introduced between mid-1997 and mid-2000 (Medicare levy surcharge, the 30% rebate and Lifetime Health Cover).

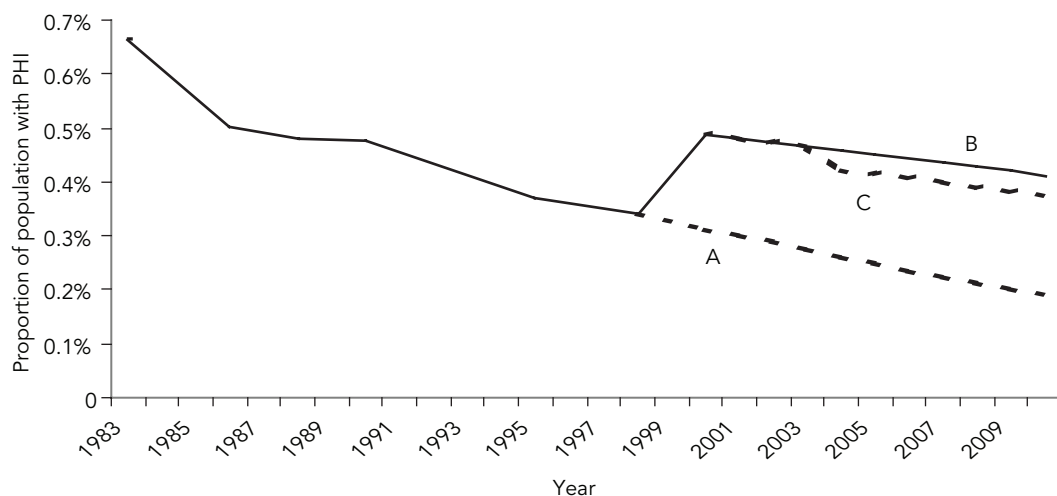
Three scenarios were modelled (Box 2), assuming that premium costs (as a proportion of household disposable income) rose at a real annual rate of 2%. The scenarios study the impact on insurance coverage of the major private health insur-

ance policy changes implemented since the late 1990s. Scenario A is a base scenario which models the decline in insurance coverage that would have occurred without the 30% rebate and Lifetime Health Cover. Under this scenario the proportion of the population covered by PHI drops to just under 20% in 2010. Scenario B is a “current world” scenario that models the decline in insurance coverage from 1983 to 1998 and the introduction of the 30% rebate and Lifetime Health Cover. Under this scenario the proportion of the population covered by PHI peaks in 2000 then gradually falls to just over 40% in 2010.

Scenario C models the same circumstances as for scenario B, but with the 30% rebate removed from 2004 onwards (thus households paying the full price of the premium,* compared with the “full price less the 30% rebate” under scenario B). Under scenario C the proportion of the population covered by PHI peaks in 2000, then gradually falls to around 35% in 2010, with a drop

* Note that this may not fully account for the flow on effects of compositional changes to the insurance pool.

2 Proportion of Australians with private health insurance (PHI) — historical series and scenarios



Sources: from 1983 to 2002: ABS Health Insurance Surveys (for years 1983, 1986, 1988, 1990, 1992, 1998) and ABS National Health Surveys (1995, 2001); from 2003: projections with the PHI model.

associated with the removal of the rebate in 2004. Box 2 charts the simulated scenario results at the aggregate PHI coverage level. The simulated impacts of these scenarios on hospital usage are reported in the Results.

Projecting NSW hospital usage

Details of the new NSW Hospitals Model are provided elsewhere.^{5,6} Below are summaries of the unit record datasets constructed and the operation of the model's projection facility.

The model is based on time-series inpatient admission data in NSW hospitals (excluding public psychiatric hospitals) from 1996–97 to 1999–00, in which services used by individual patients can be tracked within each year of the time-series (through statistical linking). Thus the number of times a patient has been admitted and administratively recorded as a “separation”[†] in a particular

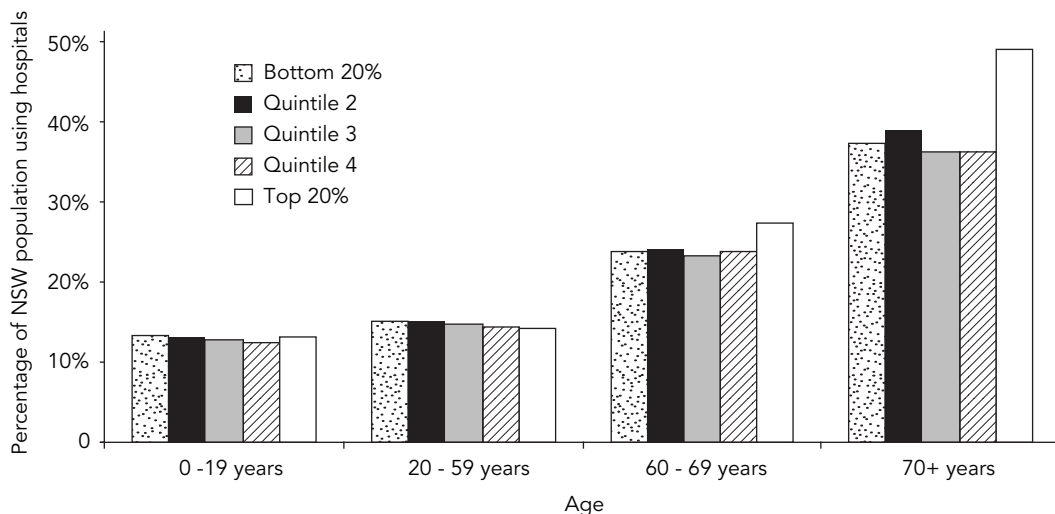
year is known. Patients can be analysed across a wide range of variables, such as age, sex, the geographic area of their residential addresses, whether admitted to a public or private hospital, and the types of services provided.

Geocoding of the hospital data at the Census Collector District (CD) level containing around 200 households allowed imputation of SES to each patient. A novel imputation method was developed that makes use of a dataset extracted by the ABS from its 1996 Census for this project. This approach is similar to the traditional geographic-area-based method, which uses patients' place of usual residence. However, unlike the traditional method, it is able to also account for several individual-level patient characteristics, such as age — a critical factor affecting health — sex and family size. We chose the commonly used “equivalent family income” (EFI) quintile indicator of SES,^{7–11} because it reflects households' relative standards of living.⁸

Box 3 shows that the older people were in 1999–2000, the more likely they were to have been hospitalised. Box 3 also shows that although the SES effect is slight, people with low SES

[†] A “separation” is the process whereby the completion of an episode of care for an admitted patient is recorded by the hospital. Separations are typically — but not always — equivalent to admissions.

3 Percentage of New South Wales population using hospitals, by age and imputed equivalent family income quintile, 1999–2000



Sources: 1999–00 NSW hospitals data; 2000 population data; 1996 census extract.

tended, within younger age groups, to use hospitals more than higher SES people. However, this was reversed for people 60 years and older (that is, top SES people used hospitals more than others in that age group). Further research indicates that this reversal mainly affected private patients in both private and public hospitals, and that the higher admission rates for top SES people 60 years and over were most pronounced for renal dialysis, chemotherapy, colonoscopies and other diagnostic scopes, rehabilitation and follow-up, and cataract operations.¹²

Onto this enhanced hospitals administrative data series, we built a facility to project 10 years ahead, accounting for population growth and ageing, and for changes in the propensity to utilise particular hospital services.^{5,6} The projections were based on the assumption that trends observed in the 1996–97 to 1999–2000 time series administrative data will continue in future. This means that the original projections do not fully account for the impact of Lifetime Health Cover because it commenced on 1 July 2000, although many people purchased PHI cover a few months before 1 July 2000, presumably to avoid

or minimise the Lifetime Health Cover's age-related loadings. Another assumption was that the change in capacity required to meet future growth in hospital utilisation will be carried out by the public and private sectors. A further assumption was that the age–sex pattern of EFI remained unchanged between 1999–2000 and 2009–10.

We chose growth in inpatient admissions (referred to later in the text as “patient numbers”) as an indicator of the “load” placed on public hospitals. There are a number of other indicators that could have been used, with waiting lists being a popular alternative (for example, for elective surgery waiting lists¹³). However, waiting lists have been seen as an indicator of “stress” on patients rather than “load” on hospitals.¹⁴ Another possible alternative, the number of inpatient days, was not chosen because of the considerable shifts that took place away from inpatient and toward same-day treatment over the time period.

The original projections of patient numbers⁶ are summarised in Box 4. The table suggests that the private hospital sector will grow considerably

4 Actual and projected number of individuals using hospitals, by socioeconomic status and hospital type, 1999–2000 and 2009–10

Socioeconomic status	Bottom 20%	Quintile 2	Quintile 3	Quintile 4	Top 20%	All
1999–00						
Public hospitals	173 900	172 500	144 800	128 800	115 600	735 600
Private hospitals	81 900	89 400	80 600	82 400	97 300	431 700
2009–10						
Public hospitals	176 900	177 300	145 600	127 700	114 361	741 900
Private hospitals	90 000	99 300	86 945	86 200	100 500	462 900
Difference						
Public hospitals	1.7%	2.8%	0.5%	–0.9%	–1.1%	0.9%
Private hospitals	9.9%	11.1%	7.9%	4.6%	3.3%	7.2%

Sources: Enhanced NSW hospitals dataset for 1999–00 and projections using the new NSW Hospitals Model.

more rapidly over the 10-year study period than the public sector (7.2% and 0.9% respectively). Possible reasons for the stronger private sector growth are the trend for uninsured patients to pay for themselves and the growth in low cost day-procedure centres that offer diagnostic procedures, such as endoscopy and colonoscopy. In

addition, new arrangements for veterans made it easier for these patients to access private hospitals. Growth in public hospital admissions was slower partly because some hospital episodes classified as “inpatient” in earlier years were reclassified as “outpatient”. For example, many of the diagnostic procedures that account for a large proportion of growth in private hospitals are classified as outpatient services in public hospitals.

Box 4 also shows that growth in the number of low SES patients (quintiles 1 and 2) was considerably stronger than growth in higher SES groups. The main reason for this was population ageing, combined with the fact that older people tended to fall into the lower SES quintiles (mainly due to their “not employed” status).

5 Type of hospital usage, by family income quintile and hospital insurance status, Australia 2001

Income quintile*	Type of hospital used			
	With hospital insurance**		Without hospital insurance	
	Public hospital	Private hospital	Public hospital	Private hospital
Bottom 20%	40.0%	60.0%	85.8%	14.2%
Quintile 2	32.6%	67.4%	91.1%	8.9%
Quintile 3	34.3%	65.7%	89.5%	10.5%
Quintile 4	23.1%	76.9%	68.7%	31.3%
Top 20%	29.5%	70.5%	80.0%	20.0%
All	31.2%	68.8%	85.7%	14.3%

* Combined household annual income-based quintiles. ** If responded “Yes” to the question: “Are you currently covered by any private health insurance, that is, cover that you pay for in addition to your basic government Medicare entitlement?”
Source: TQA survey data,¹⁵ and ABS survey,¹⁷ for estimating the size of the income bands associated with each of the income quintiles.

Linking the models

To estimate the proportion of patients with and without PHI who chose either a public or a private hospital, we obtained a data extract from a TQA Research syndicated survey.¹⁵ This 2001 survey involved 5194 telephone interviews with a random sample of insurable unit heads from all areas of Australia. The sample was weighted for, among other things, known private hospital insurance status (effectively to match Private Health Insurance Administration Council

6 Scenario A — no PHI rebate and no Lifetime Health Cover

Socioeconomic status	Number of patients*					
	Bottom 20%	Quintile 2	Quintile 3	Quintile 4	Top 20%	All
1999–00						
Public hospitals	174 513	172 313	148 269	132 430	117 915	745 439
Private hospitals	83 293	85 390	75 293	83 212	94 990	422 179
2009–10						
Public hospitals	188 799	192 505	167 042	152 788	139 727	840 862
Private hospitals	75 942	69 079	58 196	72 384	75 101	350 702
Difference 1999–00 to 2009–10						
Public hospitals	8.2%	11.7%	12.7%	15.4%	18.5%	12.8%
Private hospitals	–8.8%	–19.1%	–22.7%	–13.0%	–20.9%	–16.9%

* That is, individuals admitted as inpatients in NSW hospitals at least once in the year. Note that the results are less robust for private hospitals than for public ones (due to the small sample size of the TQA survey and the lesser numbers using private hospitals).

Sources: Enhanced NSW hospitals dataset for 1999–00; projections using the NSW Hospitals Model; and extract purchased from TQA survey (2001).¹⁵

statistics¹⁶). We studied the private or public hospital responses of the 1038 people who reported using hospitals in the 12 months before interview.

In an earlier article we described the survey in detail, discussed its limitations, and presented the responses.⁴ In Box 5 we reproduced the earlier income-based table,⁴ but rearranged the income brackets into quintiles based on ABS data,¹⁷ with the \$0–\$15 000 annual household income group representing SES quintile 1; \$15 001–\$35 000 quintile 2; \$35 001–\$50 000 quintile 3; \$50 000–\$70 000 quintile 4; and the over \$70 000 group quintile 5. We then used the Box 5 tabulation to link the PHI and NSW hospitals models.

Box 5 shows that in 2001 14% of people without insurance who reported being hospitalised in the previous 12 months used a private hospital. It also shows that among patients with PHI a much higher proportion used a private hospital (69%), and that among those without PHI an even higher proportion used public hospitals (86%). Among those with PHI, low SES people were less likely to use a private hospital than high SES people (possibly because of their fears that usage of private hospital may involve unexpected out-of-pocket expenditures).

The linking of the PHI and NSW Hospitals models through the Box 5 behavioural data was carried out as follows. First we used the PHI Model to determine the proportion of Australians with hospital insurance cover. Next we assumed that the same proportions with PHI applied in the NSW population. Finally, the data in Box 5 were used to split the total number of patients (projected by the Hospitals Model) into those using public hospitals and those using private hospitals.[‡] For each SES quintile, the total number of patients (from the NSW Hospitals Model) was first split between those with PHI and those without (based on PHI model estimates). Then, given patients' PHI status, the TQA proportions were applied to assign the patients between the public and private sectors.

Key assumptions in these computations were that PHI policies only affected the public/private hospital split, and thus had no impact on total NSW hospital utilisation; the proportions reported in the TQA survey remained constant

‡ Before using the patient choice information in Box 5 for modelling, we aligned the TQA data so that the numbers of patients in public and private hospitals predicted for 1999–2000 matched the actual number of patients that year by hospital type (as recorded in the NSW hospitals dataset).

7 Scenario B — Current private health insurance policies (Lifetime cover, levy and 30% rebate)

Socioeconomic status	Number of patients*					
	Bottom 20%	Quintile 2	Quintile 3	Quintile 4	Top 20%	All
1999–00						
Public hospitals	167 329	157 032	130 171	110 388	82 264	647 184
Private hospitals	95 131	116 137	100 227	97 143	130 641	539 279
2009–10						
Public hospitals	177 851	174 460	144 583	123 300	92 383	712 578
Private hospitals	93 980	105 390	89 140	91 020	122 445	501 976
Difference — 1999–00 to 2009–10						
Public hospitals	6.3%	11.1%	11.1%	11.7%	12.3%	10.1%
Private hospitals	–1.2%	–9.3%	–11.1%	–6.3%	–6.3%	–6.9%
Difference in 2009–10 — Scenario A to Scenario B						
Public hospitals	–5.8%	–9.4%	–13.4%	–19.3%	–33.9%	–15.3%
Private hospitals	23.8%	52.6%	53.2%	25.7%	63.0%	43.1%

* That is, individuals admitted as inpatients in NSW hospitals at least once in the year. Note that the results are least robust for private hospitals, due to the small sample size of the TQA survey and the lesser numbers using private hospitals than public ones. Sources: Enhanced NSW hospitals dataset for 1999–00; projections using the new Hospitals Model; and extract purchased from TQA survey (2001).

over time; and the Australia-wide responses were representative of those in NSW.

Results

Examination of the NSW hospitals time series data showed that the scenarios studied in this paper occurred in a period when there was stronger growth in private hospital usage than in public hospital usage. Because this pattern was evident before the introduction of PHI policies, our projections under the PHI scenarios should be seen as being superimposed onto this underlying “non-PHI policy-dependent” trend. A further study using a 1-year longer time-series dataset reports on changes in hospital rates and costs in NSW over the 1996–97 to 2000–01 period.¹⁸

Scenario A: no PHI rebate and no Lifetime Health Cover

Under this scenario the assumption is that the post-1998 PHI policies, including the 30% rebate and the Lifetime Health Cover, had not been

introduced. We modelled this by setting the simulation phase in the PHI model to commence in 1999, with actual data being retained to 1998. The impact by 2010 was a decline in PHI coverage to just under 20% of the Australian population. The consequent impact on NSW public hospital usage is estimated to be an increase of around 13% by 2009–10, relative to patient numbers in 1999–2000 (Box 6). Most of that increase was due to higher SES patients who used private hospitals in 1999–2000, but shifted to public hospitals in 2009–10 because they no longer had private hospital cover.

Consequences arising from the older population structure in 2009–10 were reported in an earlier paper,²⁰ with increases of over 30% estimated for inpatients aged 55 and over in public hospitals.

Scenario B: current PHI policies

Scenario B assumes that the current PHI policies remain operational throughout the study period. Under this scenario the PHI model's simulations

8 Scenario C — Current PHI policies, but removal of 30% rebate from 2004

Socioeconomic status	Number of patients*					
	Bottom 20%	Quintile 2	Quintile 3	Quintile 4	Top 20%	All
1999–00						
Public hospitals	162 460	157 514	131 412	112 874	100 727	664 987
Private hospitals	103 154	115 168	98 518	95 571	112 178	524 589
2009–10						
Public hospitals	173 207	174 894	145 765	125 855	114 515	734 236
Private hospitals	101 633	104 515	87 512	89 405	100 314	483 380
Difference — 1999–00 to 2009–10						
Public hospitals	6.6%	11.0%	10.9%	11.5%	13.7%	10.4%
Private hospitals	–1.5%	–9.2%	–11.2%	–6.5%	–10.6%	–7.9%
Difference in 2009–10 — Scenario A to Scenario C						
Public hospitals	–8.3	–9.1	–12.7	–17.6	–18.0	–12.7
Private hospitals	33.8	51.3	50.4	23.5	33.6	37.8

* That is, individuals admitted as inpatients in NSW hospitals at least once in the year. Note that the results are less robust for private hospitals than for public ones (due to the small sample size of the TQA survey and the lesser numbers using private hospitals).

Sources: Enhanced NSW hospitals dataset for 1999–00; projections using the NSW Hospitals Model; and extract purchased from TQA survey (2001).

commence in 2003 (that is, actual data is retained to 2002). Under this scenario hospital cover would decline to just over 40% by 2009–10. Box 7 shows that patient numbers in NSW public hospitals would be 10.1% higher in 2009–10 than they were in 1999–2000 and 15.3% lower than patient numbers predicted under Scenario A. The declines in public hospital use (and the related increases in private hospital usage) were found to be greatest for the most affluent 20% of the Australian population.

Scenario C: Current PHI policies, but 30% rebate removed from 2004

Scenario C assumes that the Lifetime Health Cover is retained, but the 30% PHI rebate is removed from 2004 onwards. Under this scenario, the PHI model's simulations commence in 2004 (that is, actual data is retained to 2003). The impact by 2010 was a decline in PHI coverage to around 35% of the Australian population. Box 8 shows that under Scenario C public hospital utilisation would increase by 10.4% in 2009–10

relative to 1999–2000 and decline by 12.7% relative to patient numbers predicted under Scenario A. This 12.7% arises almost entirely from the Lifetime Health Cover policy. Once again, the declines in public hospital usage were greatest for patients in the top SES quintile.

Comparison of Box 7 and Box 8 indicates that the impact in 2009–10 of the 30% rebate was a 2.6% decline in public hospital utilisation, with Lifetime Health Cover contributing the bulk of the reductions in the load on public hospitals (12.7%).

Conclusions, limitations and possible future improvements

The research presented in this paper extends previous analyses by studying the PHI-to-hospital-choice link at a greater level of complexity. In relation to analyses of such links, Cormack¹⁴ noted that the assumptions chosen for the modelling exercises, and the impact of the many factors external to the models, needed careful

consideration.⁸ Others relied on the available evidence to argue that subsidising private health care, rather than insurance, was a more effective way of reducing the demand for public health services.²¹

Overall, because the complex interactions between the many factors impacting on the PHI-to-hospital-use relationship are not well understood, the findings reported in this paper are unlikely to provide “definitive” answers.

Our simulations indicate that the introduction of the 30% PHI rebate and Lifetime Health Cover is likely to reduce pressure on public hospitals in future. However, most of that would be due to Lifetime Health Cover, and not to the 30% rebate which was the policy with the stated aim of reducing the load on public hospitals. Regarding distributional impacts, we found that if the new PHI policies were retained, higher SES people would switch to private hospitals. This implies that if the PHI policies were retained, a greater proportion of total hospital expenditure would be borne by individuals (and thus a lesser proportion by governments) than without these policies.

Studying the likely impact of the 30% rebate in isolation as well as with the Lifetime Health Cover was important because, unlike the rebate, Lifetime Health Cover does not involve government subsidies. While some have studied the rebate in isolation,²² others have assumed that the rebate and the Lifetime Health Cover were an inseparable package.²³

Regarding “inseparability”, the 30% rebate was introduced 18 months earlier than Lifetime Health Cover, and the increase in PHI membership that followed was small.⁴ While the rebate’s withdrawal would affect the cost of PHI, it has not as yet been demonstrated that its withdrawal

would have the reverse impact of what occurred following its introduction. As recommended by a Senate Inquiry,³ more research on the equity and effectiveness of the 30% PHI rebate and the integral Lifetime Health Cover policy could have considerable benefits.

Limitations and possible future improvements

Future studies using the linked models could improve and broaden the preliminary analyses reported in this paper. First, once historical data on the number of patients and the treatments they received becomes available, projections based on past trends could be considerably improved through extension of the study period. Once past trends can be assessed over a longer time period, the projections estimated by the NSW Hospitals Model would improve.

Second, alternative measures of hospital use could be considered. Some could reflect, for example, the number of separations and the number of separations weighted for casemix (that is differences in the nature of conditions for which patients are admitted and the intensity of the services provided).

Third, better alignment across private and public hospitals of classification methods that identify inpatients and outpatients could in future lead to more meaningful predictions by our models. Although their extent is not known, the current classification issues relating to the boundary between outpatient and same-day inpatient care cloud the interpretation of trends.

Fourth, analyses using the PHI model could be extended to estimate the impact that a range of possible future PHI policy settings may have on rich and poor hospital users, including the impact of higher or lower premium increases than the 2% annual rate we assumed. Also, the question could be asked whether, under the scenarios studied, each of these groups would be able to afford the related out-of-pocket expenditures.

Finally, because the PHI model is based on Australia-wide data, similar analyses could in future be carried out nationwide.

⁸ In this respect, assumptions of causality have been questioned, for example Powers¹³ commented that the data used by Hanning¹⁹ did not demonstrate a causative relationship between the increase in PHI coverage and the demand for private hospital services. Assumptions by some that the new PHI policies explained most of the rapid increases that occurred in private hospital admissions are also questionable, given that much of the growth in that sector arose from the take up of new medical technologies.²⁰

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Competing interests

The authors declare that they have no competing interests.

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