

**EASING THE PRESSURE:
THE INTERGENERATIONAL REPORT AND
PRIVATE HEALTH INSURANCE**

FINAL REPORT

This final report was prepared for Medibank Private Ltd by Econtech Pty Ltd in association with Harper Associates and Philip Hagan.

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Econtech was commissioned by Medibank Private Ltd to model Commonwealth Government policy towards Private Health Insurance in the context of the *InterGenerational Report*. This Report sets out Econtech's findings. Econtech makes no representations to, and accepts no liability for, reliance on this work by any person or organisation other than Medibank Private Ltd. Any person, other than Medibank Private Ltd, who uses this work does so at their own risk and agrees to indemnify Econtech for any loss or damage arising from such use.

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Abbreviations

AIHW	Australian Institute of Health and Welfare
GDP	Gross Domestic Product
GHC model	Government Health Costs model
HC module	Health Costs module
IGR	<i>InterGenerational Report</i>
LHC	Lifetime Health Cover
MBS	Medicare Benefits Schedule
PBS	Pharmaceutical Benefits Scheme
PHI	Private Health Insurance
PHIAC	Private Health Insurance Administration Council

Executive Summary

The Commonwealth Government's *Inter-Generational Report* (IGR) highlights the growing pressure on the Commonwealth Budget from the burgeoning cost of health services. As Australia's population ages and new health technologies become available, Commonwealth outlays on health services are set to double as a share of the economy over the next forty years, from around 5 per cent of GDP today to just under 10 per cent of GDP in 2041-42. Similarly, state governments face rising health outlays as a share of GDP.

This IGR projection assumes that the private sector continues to shoulder its share of health costs. This includes patient contributions to PBS pharmaceuticals, patient contributions to medical services, and private health insurance (PHI) benefits paid out by private health insurers (to the extent that those benefits are not funded by the government 30 per cent premium rebate). If this support from the private sector were to fall away, then clearly the looming pressures on Commonwealth and state government outlays on health services will be even more intense.

This Report examines the role of PHI in managing the future pressures on government health outlays, and how that role will be affected by PHI policy arrangements. As incentives for individuals to take-up PHI, the Commonwealth Government recently introduced a 30 per cent rebate on PHI premiums, and Lifetime Health Cover (LHC). LHC rewards early entry into PHI with lower lifetime premiums than for later entry, and so recognises that younger people make less use of hospitals than older people.

The effects of PHI policy on government health outlays are analysed using a purpose-built Government Health Costs (GHC) model. This model is designed to project Commonwealth and state government health outlays to 2041-42 under alternative PHI policy arrangements.

The GHC model uses the IGR modelling approach as a starting point but makes three important enhancements.

1. While the IGR only covers Commonwealth government health funding, the GHC model also covers State/Territory government health funding. This extension is important because both Commonwealth and state government health budgets face some of the same pressures from rising costs and are also impacted by the outlook for PHI.

2. In projecting the cost of the 30 per cent rebate, the IGR made the simplifying assumption that the cost of the rebate moves with certain Commonwealth Government health costs. In contrast, the GHC model takes into account that the cost of the rebate actually moves with PHI premiums, which are modelled in detail, taking into account the factors that affect PHI population coverage and benefits paid.
3. The IGR modelling makes the simplifying assumption that PHI benefits have no impact on Government health costs, whereas the GHC model takes into account that to some extent they are substitutes. In particular, in the GHC model a rise in PHI benefits will reduce government health costs to the extent that the type of health services being funded by the PHI benefits would otherwise be funded by government.

To explore the effects of the PHI policy environment, the GHC model has been used to produce three scenarios, each extending to 2041-42 in line with the IGR. The scenarios are:

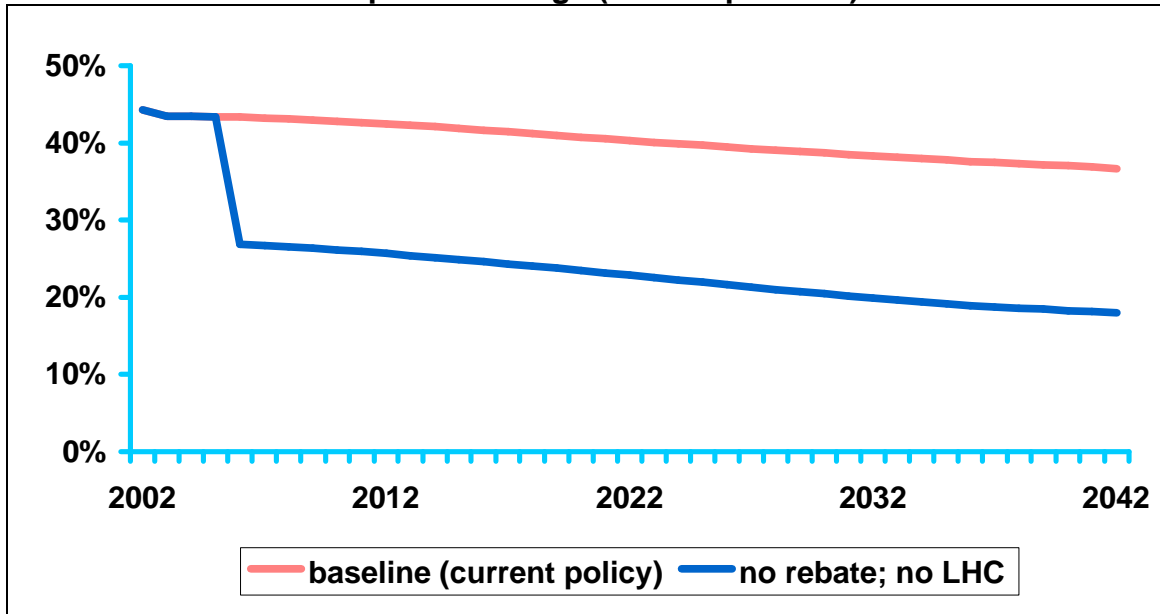
- § a “baseline” scenario, in which current arrangements, including the 30 per cent rebate and LHC, remain in place over the simulation horizon – this is to test whether the PHI system is sustainable under current policy arrangements;
- § a “loss of rebate and LHC” scenario, where both the 30 per cent rebate and LHC are abolished – this is to test whether the PHI system would be sustained if these recent policy initiatives were reversed; and
- § a “no PHI” scenario, where the PHI industry disappears – this scenario investigates the effects on government budgets if the PHI system were to collapse.

Each scenario yields its own key policy conclusion as shown in the box of key policy findings below. An analysis of the results of the scenarios also exposes a key point about fairness. Under the current policy arrangements, the government contributes 30 cents in every dollar of PHI premiums through the rebate. However, the insured person contributes the remaining 70 cents, and so helps fund the health system, relieving pressure on government health outlays. In fact, for every \$1 the government spends in rebate for an insured person, it spends \$2 in meeting the health needs of an uninsured person that could otherwise be covered by PHI benefits. Yet insured and uninsured persons contribute on the same basis to funding government health outlays through the Medicare levy and general taxation. So the 30 per cent rebate represents a modest government contribution to the health costs of the insured.

Key Findings

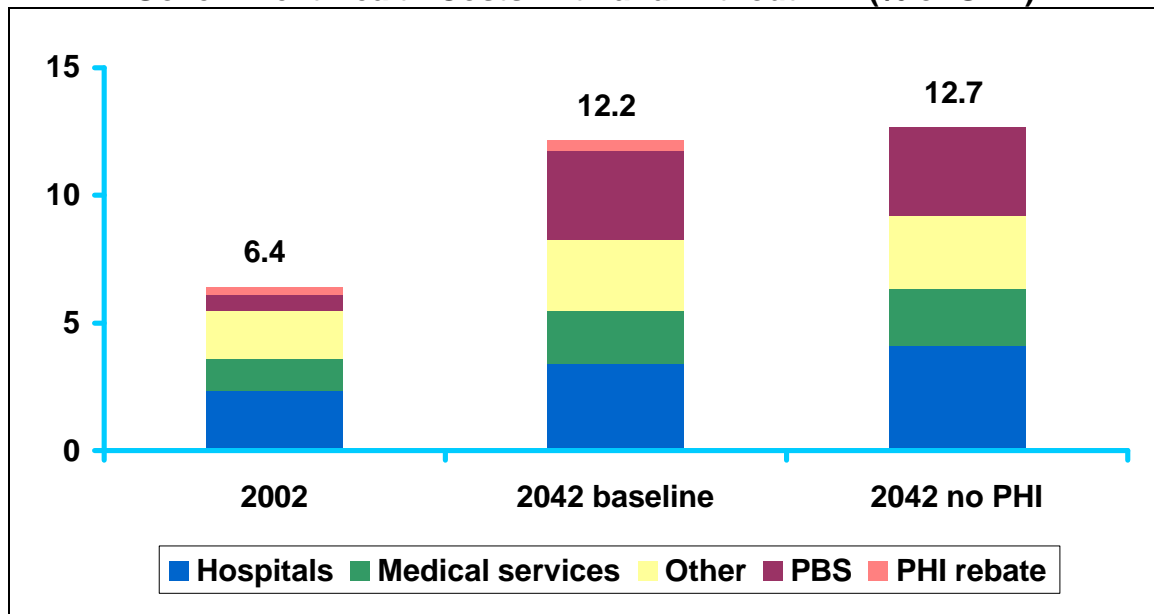
- § Under current policy arrangements, the outlook for PHI coverage is reasonably positive. As shown in Chart 1, under current policy, hospital coverage is projected to decline modestly from 43 per cent now to 37 per cent by 2041-42, which is still well above the lows of the late 1990s. This means that the current policy arrangements will ensure the sustainability of PHI for at least the next four decades (“baseline” scenario).
- § Under the baseline scenario, the GHC model produces very similar projections of future Commonwealth Government health costs to those contained in the IGR. In both projections, Commonwealth health outlays, including direct outlays and outlays via state governments, are projected to climb from between 4 and 5 per cent of GDP to between 9 and 10 per cent of GDP.
- § If the recent policy measures were not introduced or are reversed in the future, PHI coverage would fall to unprecedented low levels, making it potentially unviable. As shown in Chart 1, without the 30 per cent rebate and without LHC, hospital coverage is projected to fall to only 18 per cent of the population by 2041-42 (“no rebate; no LHC” scenario). The viability of the PHI system would then be in question, so in reality this scenario may metamorphise into a scenario without a PHI sector (see below).
- § Our estimates of the gain in PHI coverage due to the 30 per cent rebate lie between those of Access Economics and Clarke/Deeble. Our estimates are more robust because we allow for both the direct and indirect effects of the rebate and also take into account the impact of LHC, including its interacting effects with the rebate.
- § If the PHI system were to collapse, government budgets would come under increased pressure. As shown in Chart 2, Commonwealth and State Governments together already face an enormous jump in health outlays from 6.4 per cent of GDP in 2001-02 to 12.2 per cent in 2041-42. If PHI were to disappear, the jump would be even higher to 12.7 per cent of GDP, representing an additional rise of 0.5 percentage points of GDP. This is because while the government would “save” 0.4 per cent of GDP from the disappearance of the 30 per cent rebate, this would be outweighed by additional health outlays of 0.9 per cent of GDP in areas no longer funded by PHI benefits, especially hospitals (“no PHI” scenario). In the GHC model the funding gaps left by the disappearance of PHI benefits are filled by other funding sources, including government and private sectors, according to their existing funding relativities. In an earlier report for Medibank Private, *Preserving Choice* (Harper, 2003), the estimates of the cost to government from the disappearance of PHI were very similar.
- § So PHI is a major source of funding of health costs. For each 30 per cent rebate dollar spent by government, it saves two dollars of costs funded by private health insurers.

Chart 1
Hospital Coverage (% of Population)



Source: GHC model

Chart 2
Government Health Costs With and Without PHI (% of GDP)

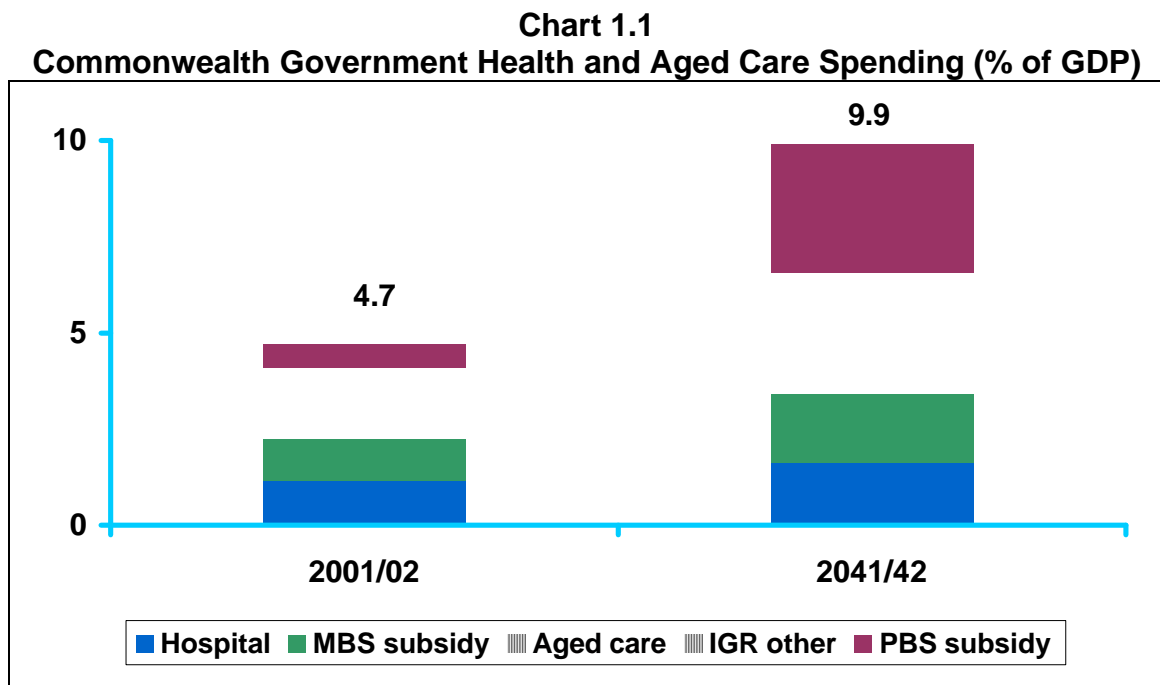


Source: GHC model

1. Introduction

Commonwealth spending on health is set to grow rapidly over coming decades. This reflects the increasing cost, availability and use of advanced medical procedures and drugs, as well as the ageing of the Australian population.

According to projections in the Commonwealth Treasury's *InterGenerational Report* (IGR) (see Chart 1.1), Commonwealth spending on health and aged care will more than double as a share of GDP over the next forty years. Specifically, it is projected to rise from 4.7 per cent of GDP in 2001-02 to 9.9 per cent of GDP in 2041-42. State governments face a looming fiscal problem of their own for similar reasons.



Source: IGR

In an earlier report for Medibank Private Limited, Harper (2003) shows that the private sector plays a significant role in containing government spending on health and aged care. Each year, private hospitals share the burden of the national case-load with public hospitals.

In 2001-02, private hospitals performed medical procedures that would have cost the public hospital system \$4.3 billion to undertake. In other words, without the private sector, the cost

of public hospital services would have been around one-third higher than they were, i.e., \$18 billion rather than \$14 billion.

This report undertakes detailed economic modelling to further develop the analysis of Harper and place it in the context of the IGR. The Government Health Costs (GHC) model was purpose-built for this report using the IGR modelling approach as a starting point. This makes it possible to extend the Harper analysis by looking forward, like the IGR, to 2041-42.

The GHC model enhances the IGR modelling approach by:

- § extending the modelling from Commonwealth Government health costs to also cover State/Territory Government health costs;
- § by modelling the cost of the 30 per cent rebate more accurately by taking into account that it moves with PHI premiums; and
- § by recognising that a rise in PHI benefits will to some extent reduce government health costs. In particular, in the GHC model funding gaps left by the disappearance of PHI benefits are filled by other funding sources according to their existing relativities in non-PHI funding for each type of health service.

The future of PHI is fundamentally affected by Commonwealth Government policies. As incentives for individuals to take-up PHI, the Commonwealth Government recently introduced a 30 per cent rebate on PHI premiums and Lifetime Health Cover (LHC). The rebate was effective from January 1999, while LHC was effective from 15 July 2000¹. LHC rewards entry into PHI by 30 years of age with lower lifetime premiums than for later entry, and so recognises that younger people make less use of hospitals than older people.

These policy arrangements, which are now part of the landscape, produced a marked increase in the take-up of private health insurance (PHI). Hospital coverage rose from a low of 30 per cent of the Australian population at the close of 1998, when the fate of PHI seemed uncertain, to a healthy 43 per cent in mid-2003. This raises a number of policy questions about the future that are addressed in this report.

- § Will the current policy arrangements be sufficient to ensure the sustainability of the PHI system in the long term?

¹ LHC was originally to be effective from 1 July 2000 but this was extended to 15 July 2000 to give PHI funds sufficient time to process a flood of new members wishing to join ahead of the introduction of LHC.

- § What would happen if the recent policy initiatives were reversed, in particular, would the PHI system survive?
- § If the PHI industry were to disappear because of lack of government support in the future, what would be the effects on government budgets?
- § What does a comparison of relative government funding of insured and uninsured persons say about the fairness of the current arrangements?

These questions are the focus of the current Report. They are answered by using the GHC model to simulate three scenarios to 2041-42:

- § a **“baseline”** scenario, in which current arrangements, including the 30 per cent rebate and LHC, remain in place over the simulation horizon – this is to test whether the current policy arrangements are sustainable;
- § a **“loss of rebate and LHC”** scenario, where both the 30 per cent rebate and LHC are abolished – this is to test whether the PHI system would be sustained if the recent policy initiatives were reversed; and
- § a **“no PHI”** scenario, where the Private Health Insurance (PHI) industry disappears – this scenario investigates the effects on government budgets if the PHI system were to collapse.

In each scenario, the impact of the steadily ageing population on government health outlays is modelled. So too is the impact on PHI coverage of premiums, benefits, the 30 per cent rebate and LHC.

Following this Introduction, Section 2 outlines the approach to modelling the various scenarios. Section 3 reviews recent literature on private health insurance. Section 4 presents the findings under the baseline scenario. These findings are compared to the findings of the *InterGenerational Report* (IGR). Section 5 presents the findings under the old policy scenario of ‘no rebate and no LHC’ while Section 6 investigates the implications of the disappearance of PHI. Finally, policy implications and conclusions are discussed in Section 7.

The full GHC model results are set out in the Attachment, while the workings of the GHC model are explained in the Appendix.

DISCLAIMER

While all care, skill and consideration have been used in the preparation of this report, the report is based on the terms of reference of Medibank Private Limited and so this report should be used only for the specific purpose set out below.

The specific purpose of this report is to model Commonwealth Government policy towards Private Health Insurance in the context of the *InterGenerational Report (2002)*.

The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be used whenever using this information.

2. Modelling Approach

This Government Health Costs (GHC) model has been constructed by Econtech for this report to generate scenarios for government health costs under a range of assumptions about Commonwealth Government PHI policy. The projections distinguish health costs by type of health service and source of funding. The projections are for a long-term horizon extending to 2041-42, in keeping with the *InterGenerational Report* (IGR).

The IGR, which was released with the 2002-03 Commonwealth Budget in May 2002, was the starting point for the GHC model. Compared to the IGR, the GHC model was required to incorporate three key enhancements, as seen in Table 2.1. These enhancements are explained further following the table.

Table 2.1
IGR versus GHC Model

Attribute	IGR	GHC
1. Funding sources	Commonwealth Government	Commonwealth & State Governments
2. Base for PHI rebate	Certain Commonwealth Government health costs	PHI premiums
3. Impact of PHI benefits on Government Health Costs	Nil	Allowance for substitution where applicable

1. While the IGR only covers Commonwealth Government health funding, the GHC model was required to also cover State/Territory Government health funding. This extension is important because both Commonwealth and State Government health budgets face some of the same pressures from rising costs and are also impacted by the outlook for PHI. As the project developed, its scope was further extended to cover all sources of health funding, including private funding sources such as PHI benefits. This was so the model could take into account that PHI benefits in part substitute for government health funding (see point 3).
2. In projecting the cost of the 30 per cent rebate, in the IGR “private health insurance was assumed to grow with the MBS, hospitals and nursing homes”². That is, the simplifying assumption was made that the cost of the rebate moves with certain

Commonwealth Government health costs. In contrast, the GHC model takes into account that the cost of the rebate actually moves with PHI premiums. In particular, the PHI module applies the rebate rate to model projections of premiums founded on projections of population, PHI coverage and PHI benefits. This is an important refinement because if PHI coverage rates vary significantly in the future, as they have in the past, then PHI premiums are unlikely to follow the IGR assumption of moving in line with certain Commonwealth Government health costs.

3. The IGR makes the simplifying assumption that PHI benefits have no impact on Government health costs, whereas the GHC model takes into account that to some extent they are substitutes. In particular, in the GHC model a rise in PHI benefits will reduce government health costs to the extent that the type of health services being funded by the PHI benefits would otherwise be funded by government.

The GHC model consists of two modules. These are the HC module, which is concerned with modelling total health costs, and the PHI module, which is concerned with modelling PHI benefits, which are a significant source of funding of total health costs. These two modules are described in more detail in the Appendix to this report. Here the focus is on the overall workings of the GHC model.

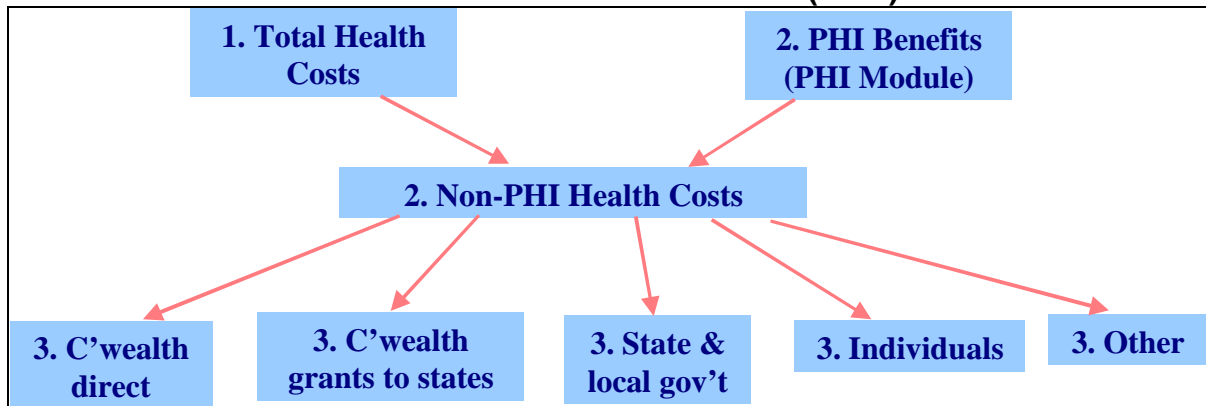
The workings of the model follow a 3-step process, as shown in Figure 2.1.

In the first step, the HC module is used to project demand, or the total amount to be spent, on each type of health service. This involves applying projections of real spending on each type of health service by gender by age to projections of the population by gender by age.

In the second step, the PHI module projects the amount of spending on each type of health service that is funded by PHI benefits. This depends on separate projections for hospital and ancillary insurance of coverage by gender by age, as well as associated projections of benefits. The modelling of coverage by gender by age involves a comparison of effective premiums with expected benefits. Expected benefits have always increased with age and the introduction of LHC means that effective premiums (although not actual premiums, which are based on entry age) also increase with age.

² Intergenerational Report 2002-03, Budget Paper No. 5, 14 May 2002.

Figure 2.1
Structure of Government Health Costs (GHC) Model



Note:

“Other” refers to other private sources of funding such as Workers Compensation and Third Party insurance pay-outs.

PHI benefits from the second step are deducted from total demand for each type of health service from the first step to determine the balance of health costs to be funded from non-PHI sources. In the third step, the HC module allocates the balance of health costs across the various non-PHI funding sources shown in Figure 2.1, based on existing relativities.

This third step assumes that if PHI no longer funds health services, the other five funding sources will completely fill the gap (based on existing funding relativities for each type of health service). This is likely to occur for the most part, but there may be some services currently funded from PHI benefits that would not be provided to the same extent if PHI disappeared. However, this does not mean that the modelling overstates the adverse consequences of the disappearance of PHI. To the extent that some services are no longer provided, the modelling will overstate the additional costs for government and other funders, but it will also not take into account that valuable health services have been lost. Given these offsetting considerations, the simplifying assumption that other funding completely fill gaps left by PHI is maintained.

The approach shown in Figure 2.1 is applied separately for each type of health service. The GHC model distinguishes eight categories of health services, as shown in the middle column of Table 2.2. These are an aggregated version of the health service categories used by the Australian Institute for Health and Welfare (AIHW), which are shown in the final column of Table 2.2. By comparison, the IGR uses the five broader categories that are shown in the first column of the table, which can be loosely compared with the GHC and AIHW categories.

Table 2.2**Health Service Categories**

IGR categories	GHC categories	AIHW categories
Hospitals	Hospitals	Hospitals Public (non-psychiatric) Public (psychiatric) Private
Medical Services	Medical services	Medical services
Pharmaceuticals	PBS pharmaceuticals	PBS pharmaceuticals
	Non-PBS pharmaceuticals	Non-PBS pharmaceuticals
Aged Care	High-level residential aged care	High-level residential aged care
Other	Ancillary	Ancillary Ambulance Other health professionals Aids and appliances Dental services
	Miscellaneous	Miscellaneous Community/public health Research Capital outlays
	Health administration	Health administration

Note:

IGR definitions of categories are generally based on the Commonwealth Budget and vary from some AIHW definitions

For the purposes of producing scenarios for this report, it was assumed that the hypothetical policy changes that are simulated would be announced in the 2005-06 Commonwealth Government budget and implemented from 1 July 2006. However, the precise timing of any policy changes is not a material consideration since the main focus is on the long-term implications in 2041-42.

As noted above, the HC and PHI modules are described in more detail in the Appendix to this report.

3. Review of Literature

There is a growing literature on the role and worth of PHI in Australia. Commentators and critics have mounted both vigorous attacks on and defences of this component of Australia's health care system — with the 30 per cent rebate a particular focus. For example, in a report to State and Territory Health Ministers, Deeble (2003)³ criticised the rebate, claiming it had done little to boost PHI coverage of the population. On the other side of the debate, Harper (2003)⁴ suggested that any collapse of the PHI industry would add to government health outlays, with the saving from the disappearance of the rebate outweighed by increased spending on public hospitals to fill the gap left by the demise of private hospitals.

These arguments have been backed by appeals to salient facts and simple figuring. However, since Australia's health system is characterised by interdependencies among their various parts — both in terms of their operation and funding — proper illumination of the issues requires a quantitative framework which systematically takes these interdependencies into account. Bringing such a framework (in the form of the GHC model) to bear on the controversy is the unique contribution of this Report.

This Section briefly reviews other recent quantitative analyses of PHI and the contribution it makes to Australia's health system. Previous estimates of the gains in coverage from the 30 per cent rebate are compared with estimates from the GHC model.

A recent Access Economics report, *Striking a Balance: Choice, Access and Affordability in Australian Health Care*, states that “affordability remains the most significant driver of coverage”⁵. Access Economics estimates that the 30 per cent rebate increased coverage by 11 percentage points. However, this is likely to be an over-estimate because their estimation method does not separately allow for the impact of the introduction of LHC (also designed to boost coverage).

³ Deeble, J (2003), ‘The private health insurance debate,’ report to State and Territory Health Ministers, January.

⁴ Harper, I (2003), ‘Health sense: when spending money saves money,’ Policy, Spring.

⁵ Access Economics ‘Striking a Balance: Choice, Access and Affordability in Australian Health Care’, October 2002, page 10

Deeble⁶ (2003) explains that, prior to the introduction of the 30 per cent rebate, Clarke conducted a survey gauging people's buying intentions before the effect of the rebate was in place. Deeble reports that Clarke estimated that the 30 per cent rebate would add 4 percentage points to hospital coverage and 5.6 percentage points to ancillary coverage. These estimates are likely to be under-estimates for two reasons. First, the survey data used are based on hypothetical responses, rather than observed behaviour, as used in the Access Economics and GHC modelling, which show larger responses. Second, the survey data only accounted for the direct effects of the rebate, whereas the GHC model estimates include the direct and indirect effects. The indirect effect is that, by increasing the proportion of younger, generally healthier, individuals in the insured pool, the rebate reduces average benefits and therefore the gross premium, before deduction of the rebate itself (the direct effect).

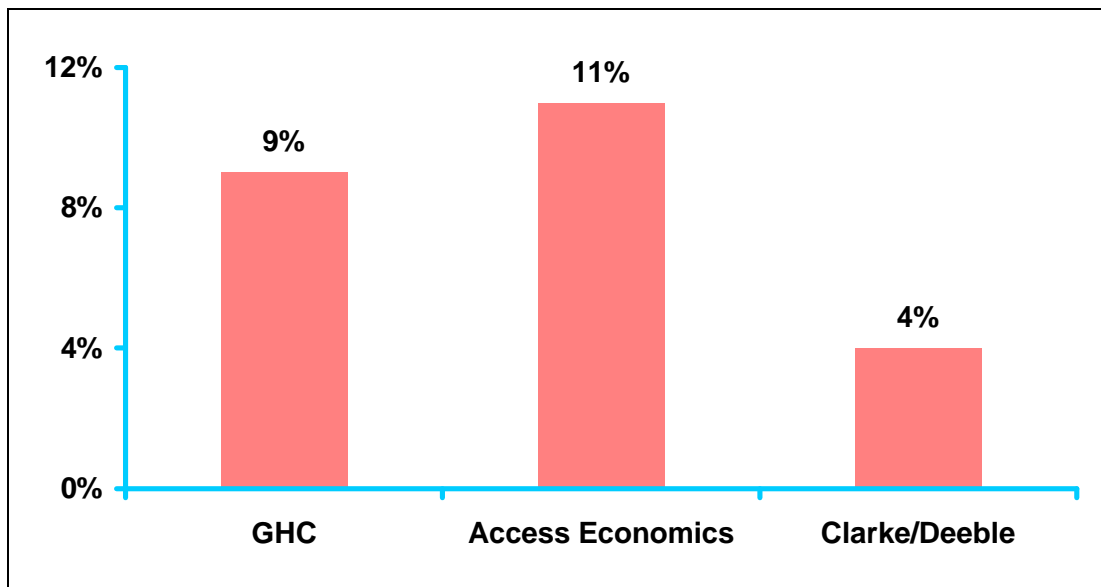
In the GHC model, decisions about whether to take out PHI are based on the balance of premiums to expected benefits. Thus, to estimate the gain in coverage due to the 30 per cent rebate, the decision making by different groups of consumers (based on age and gender) was investigated. This involved examining how expected benefits and coverage both vary with age. This micro approach is more rigorous than the macro approaches undertaken in the earlier studies. As a cross check, the resulting estimates of gain in coverage due to the combined effect of the rebate and LHC were compared with the observed changes in actual coverage rates. It was found that the estimates from the modelling closely match the observed change in coverage. See section two and the Appendix for further information on the GHC model.

Table 3.1 below shows the GHC model estimates of the gain in coverage due to the rebate, with and without the subsequent introduction of LHC for both direct and total (direct and indirect) effects. The direct effect of the 30 per cent rebate is increased affordability of premiums. Put simply, after the introduction of the rebate, individuals no longer have to pay 100 per cent of the premium, but only 70 per cent. The increased affordability of private health insurance drove hospital coverage up (before LHC) by 8 percentage points according to the GHC model. By also taking into account a further reduction in pressure on premiums due to indirect effects, particularly the increase in the proportion of younger, generally

⁶ Deeble, John, 'The private health insurance rebate' January 2003, page 6.

healthier, individuals induced into the insured pool by the rebate, the total gain in hospital coverage (with LHC in place) is estimated at 9 per cent (see Chart 3.1). This involves a reduction in the insurance problem of “adverse selection”, where insurance attracts individuals with higher risks if insurance companies are not able to fully distinguish risk levels through variations in premiums.

Chart 3.1
Hospital coverage gain due to introduction of the rebate
(% of Population)



Our estimates of the gain in coverage due to the 30 per cent rebate from the GHC model lie between those of Access Economics and those of Clarke (as reported by Deeble), distinguish explicitly between direct and indirect effects, and take into account the interacting effects with the introduction of LHC. We regard them as more robust than any other estimates so far published.

Table 3.1
Coverage gain from 30 per cent rebate (percentage points)

	hospital	ancillary	omission
GHC			
without LHC in place:			
- direct	8%	11%	
- total	11%	11%	
with LHC in place:			
- direct	7%	11%	
- total	9%	11%	
Access Economics	11%		LHC
Clarke/Deeble	4.0%	5.6%	adverse selection

4. Baseline Scenario (Scenario 1)

As explained in the introduction, the GHC model was used in this report to generate three scenarios to 2041-42. These are a “baseline” scenario, which is discussed in this section, a “loss of rebate and LHC” scenario, which is presented in section 5, and a “no PHI” scenario, which is presented in section 6. The key results are summarised in chart form with the discussion of each section, while an Attachment containing detailed tables of results is available on request from Medibank Private.

The baseline (or “business as usual / no change”) scenario is based on existing policy arrangements in the health sector and projects forward to 2041-42. This includes the maintenance of the 30 per cent rebate and LHC. The baseline scenario has three aims. First, it is designed to answer the question of whether the current policy arrangements will be sufficient to ensure the sustainability of the PHI system in the long term. Second, it is used to compare our projections of the looming government health budget problem with that contained in the IGR. Third, it serves as a point of reference for the remaining two scenarios — the results of those two scenarios are often expressed as deviations from the “baseline” scenario.

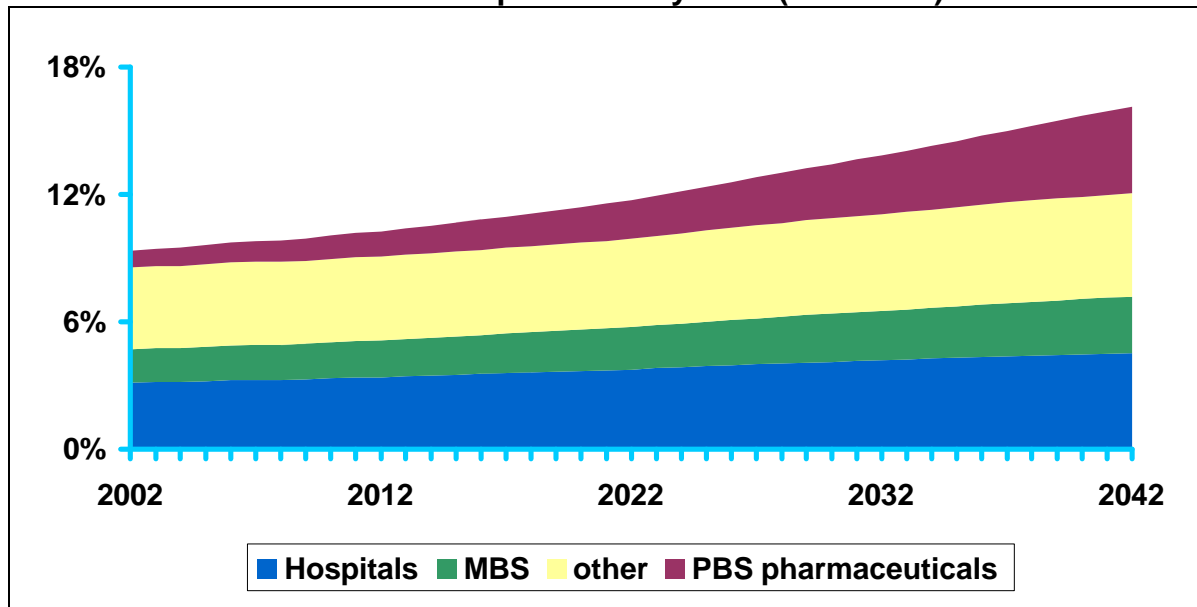
In discussing the baseline scenario, this section in turn:

- § presents the projections for health expenditure;
- § compares these with the government expenditure projections contained in the *InterGenerational Report (IGR)*; and
- § presents projections from our baseline scenario for PHI.

4.1 Health Expenditure

Chart 4.1 shows the baseline scenario projections on expenditure on health by all funders according to the type of health service. As mentioned in section two, these projections involved applying projections of real spending on each type of health service by gender by age to projections of the population by gender by age. The base year gender and age pattern of expenditure for each type of health service was obtained from the AIHW, while future real average annual growth rates were taken from the IGR.

Chart 4.1
Total Health Expenditure by Area (% of GDP)



Source: GHC model

Note: In “other”, the chart combines five separate categories of health services from the GHC model, namely non-PBS pharmaceuticals, high-level residential aged care, ancillary, miscellaneous and administration health costs.

Expenditure on hospital services can be used as an example to explain the expenditure growth projections, which can be considered to be made up of three components. These three growth components can be added together to arrive at overall average annual real growth in spending on each type of health service.

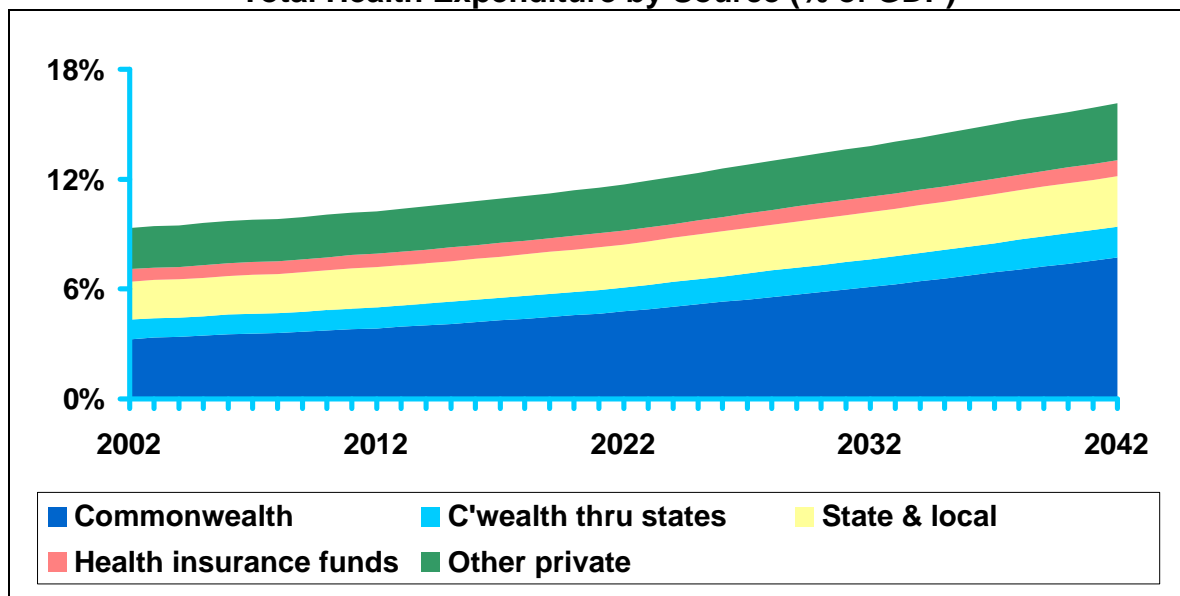
The first component, referred to in the IGR as the “non-demographic” effect, is real growth due to changes in the nature and relative price of hospital services. This non-demographic effect is driven mainly by new health technologies. The IGR assumes a non-demographic growth component of just over 1.6 per cent per annum for hospitals. To this can be added the second component, average annual population growth to 2041-42 of 0.8 per cent. Finally, ageing of the population means an increasing proportion of the population will fall in age ranges that are high users of hospital services, giving a third, ageing component that is worth 0.7 percentage points. Adding the three components together gives total average annual growth in real hospital spending of 3.1 per cent. Allowing for CPI inflation of 2.5 per cent, this translates into nominal growth of 5.7 per cent.

The annual real growth for hospital expenditure of 3.1 per cent exceeds the IGR projection for average annual real growth in GDP over the same 40-year period of 2.1 per cent. Consequently, Chart 4.1 shows hospital expenditure rising as a share of GDP.

Similar rising trends are observed for other areas of health expenditure. The starkest example is expenditure on PBS pharmaceuticals, which is projected to rise rapidly due to the IGR assumption of a very high “non-demographic” effect in this area of health expenditure.

Chart 4.2 provides an alternative breakdown of health expenditure, this time according to funder. Not surprisingly, the trend to rising health costs as a share of GDP shown in Chart 4.1, leads to rising health costs as a share of GDP for each of the five funders.

Chart 4.2
Total Health Expenditure by Source (% of GDP)



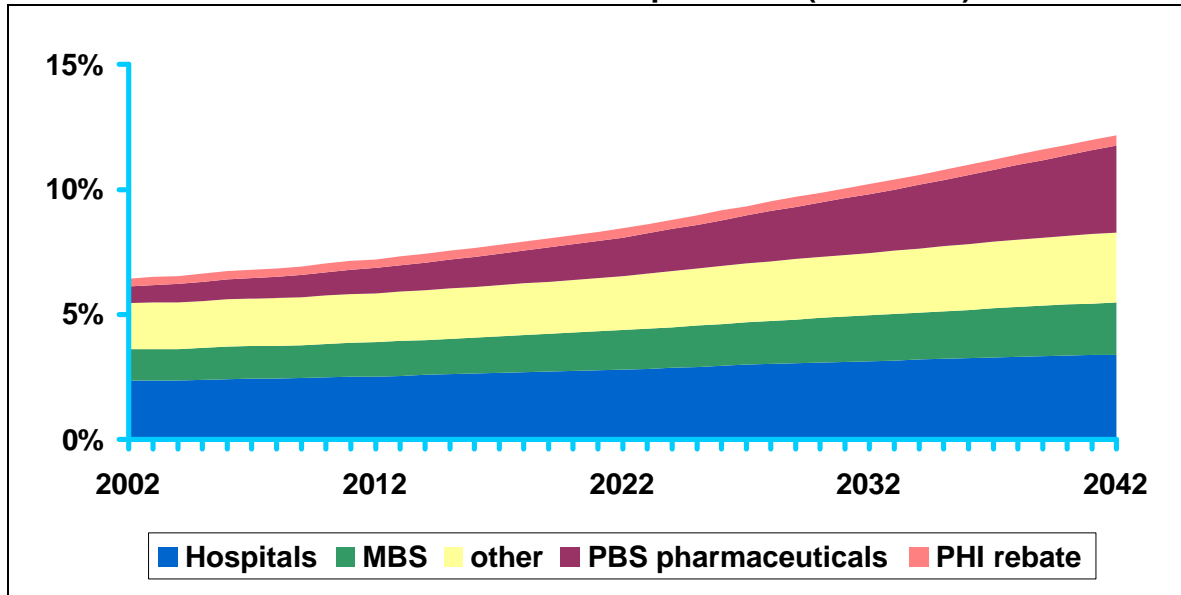
Source: GHC model

Note: “Other private” includes individuals and other non-government health funding sources.

This upward expenditure trend is strongest for the Commonwealth Government. It is projected to experience a blow-out in its health outlays from between 4 and 5 per cent of GDP in 2001-02 to between 9 and 10 per cent of GDP in 2041-42. This includes a blow-out from about 1 to 2 per cent of GDP in its health grants to State Governments. The state governments themselves face a blow-out in self-funded health outlays from about 2 to 3 per cent of GDP.

Charts 4.3 and 4.4 provide information on the sources of the projected blow-out in government health outlays. Chart 4.3 projects total Commonwealth and State government health outlays by type of health service, while Chart 4.4 shows this information for the Commonwealth Government alone.

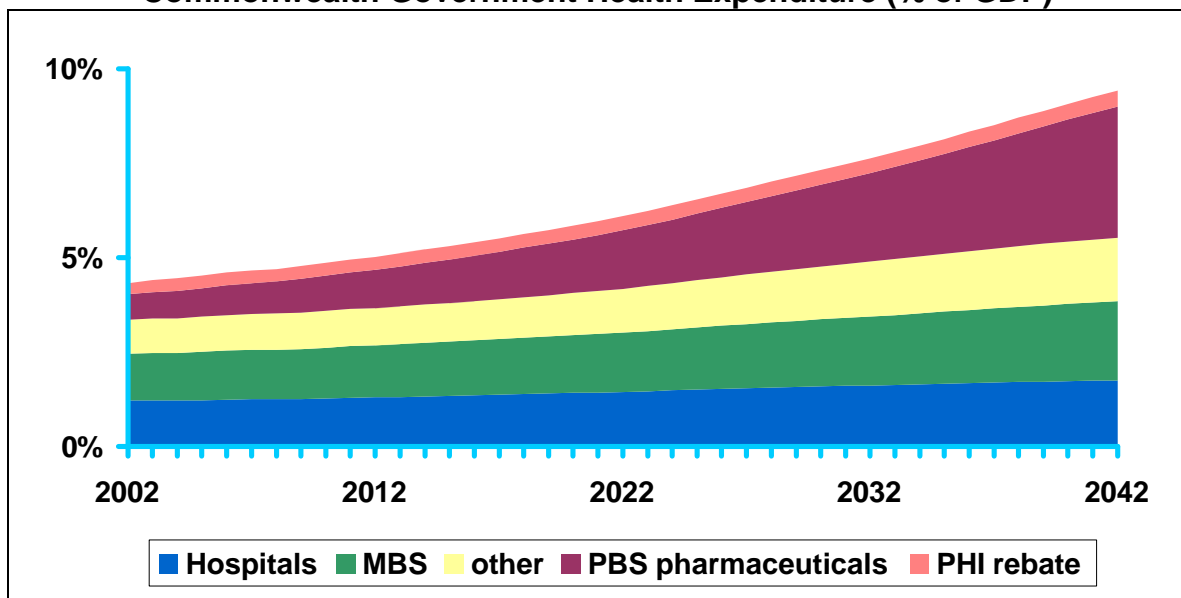
Chart 4.3
Total Government Health Expenditure (% of GDP)



Source: GHC model

Note: "Other" includes non-PBS pharmaceuticals, high-level residential aged care, ancillary, miscellaneous and administration health costs.

Chart 4.4
Commonwealth Government Health Expenditure (% of GDP)



Source and notes: see Chart 4.3.

Chart 4.4 shows that the PBS is the biggest single driver of the projected blow-out in Commonwealth Government health outlays. PBS expenditure is projected to climb steeply from about 1 to 4 per cent of GDP over the next forty years. This reflects the IGR assumption of a strong non-demographic effect, as past experience shows rapid real growth in the PBS due to “increased availability and use of newer and more expensive drugs”.

Other areas of Commonwealth Government health outlays are projected to increase more slowly as a share of GDP. For example, outlays on the PHI rebate are projected to rise from only 0.3 to 0.4 per cent of GDP over the next 40 years, accounting for only 0.1 percentage points of GDP of a projected total increase in Commonwealth Government health outlays of 5.1 percentage points of GDP.

Chart 4.3 differs from chart 4.4 in including state government own-funded outlays. The projected blow-out in these outlays, which are mainly in the hospital area, pushes the total increase in government health outlays in the next forty years from about 5 to 6 percentage points of GDP.

Our projection for Commonwealth health outlays (including via state governments) can be compared with that contained in the *InterGenerational Report* (IGR).

4.2 Comparison with the InterGenerational Report

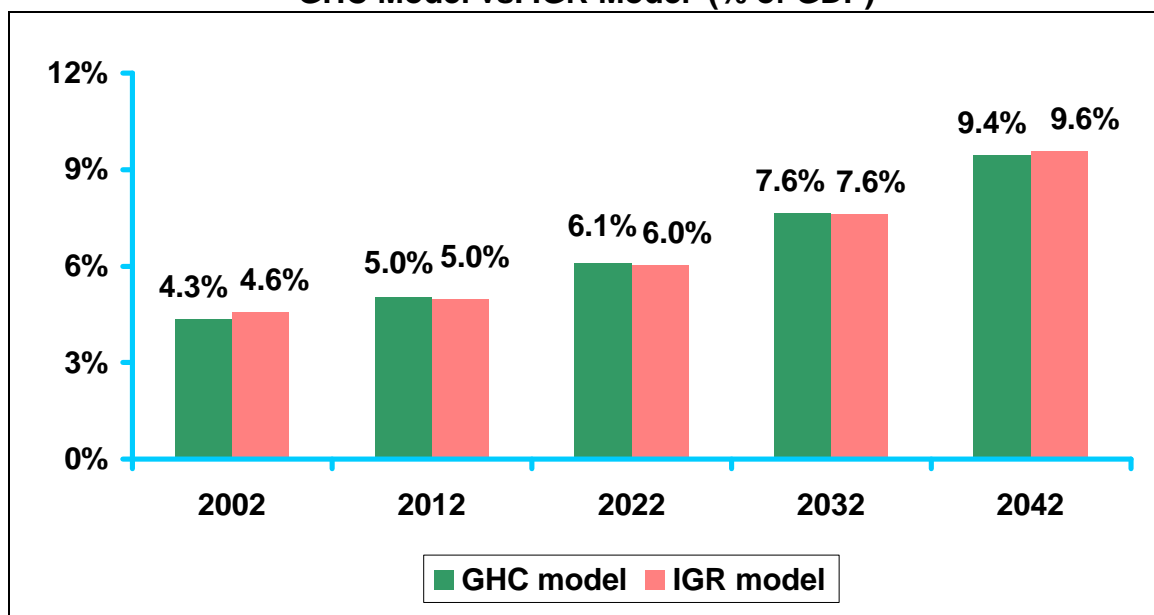
In the baseline scenario, health costs have been projected through to 2041-42 assuming that existing policies and arrangements remain in place over the entire simulation period. A similar exercise was conducted by the Department of Treasury with the findings released in the *InterGenerational Report*⁷ (IGR) in 2002. Projections of health expenditure funded by the Commonwealth Government that have been generated by the GHC model (under the baseline scenario) can therefore be compared to corresponding findings of the IGR.

The Commonwealth Government’s *InterGenerational Report* pointed to the pressures on the Commonwealth Government Budget arising from a projected increase in the Commonwealth’s health costs. Ageing of the population and the uptake of new technologies are projected to drive the Commonwealth’s health costs from 5 to 10 per cent of GDP in the

forty years to 2041-42. The comparison between results generated in the GHC and IGR models is shown in Chart 4.5 below.

Chart 4.5 shows that the GHC model and the modelling underlying the IGR produce very similar projections of future Commonwealth Government health costs (in both cases under the assumption that existing health policies remain in place). In both projections, Commonwealth health outlays, including direct outlays and outlays via State governments, are projected to climb from between 4 and 5 per cent of GDP to between 9 and 10 per cent of GDP.

Chart 4.5
Commonwealth Government Health Expenditure:
GHC Model vs. IGR Model (% of GDP)

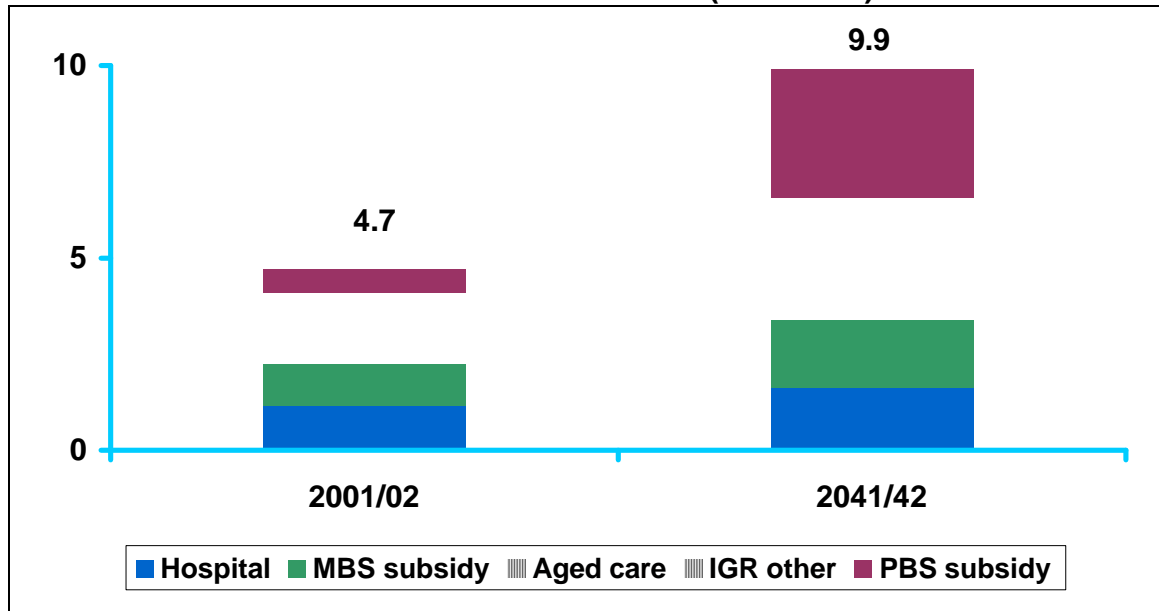


Source: GHC model and IGR

The projected composition of these outlays between different health services is also similar, as shown in Chart 4.6. In fact the marginally higher projection from the IGR of outlays of 9.6 per cent of GDP against 9.4 per cent of GDP in the GHC model is accounted for by a definitional difference that is apparent from Chart 4.6. The IGR data includes all residential aged care, while the AIHW data on which the GHC model is based only includes high-level residential aged care (nursing homes) in its definition of health services.

⁷ InterGenerational Report 2002-03, Budget Paper No. 5, 14 May 2002

Chart 4.6
Commonwealth Government Health Expenditure:
GHC Model vs. IGR Model (% of GDP)



Source: GHC model and IGR

Note: "IGR other" includes health expenditure other than hospital, MBS and PBS pharmaceuticals health costs.

4.3 PHI Outcomes

A key issue to be addressed by the baseline scenario is whether current PHI policy arrangements will be sufficient to maintain a viable PHI system in the long-term. This depends mainly on whether PHI coverage rates will continue to be high enough to maintain a viable system.

Schofield (1997) finds that many factors influence decisions to take out PHI. These factors include income, gender and age. Age is a significant factor because the expected benefits from having hospital coverage increase with age. Further, Wilson (1995) finds that there are some differences in the factors driving hospital and ancillary coverage. Both authors also consider premiums to be an important factor driving PHI coverage but are not able to take it into account because they use cross-sectional data, which does not show the variation in premium levels that is seen in time series data.

To take these various factors into account, in the GHC model, hospital coverage and ancillary coverage are both modelled separately for 28 groups defined by gender and age. The proportion of each group with each type of cover is assumed to depend on a balancing of the

real premiums and benefits faced by a group, as described in the modelling Appendix. The various PHI policy scenarios in this report are expected to mainly influence PHI coverage through their effects on PHI premiums and/or benefits.

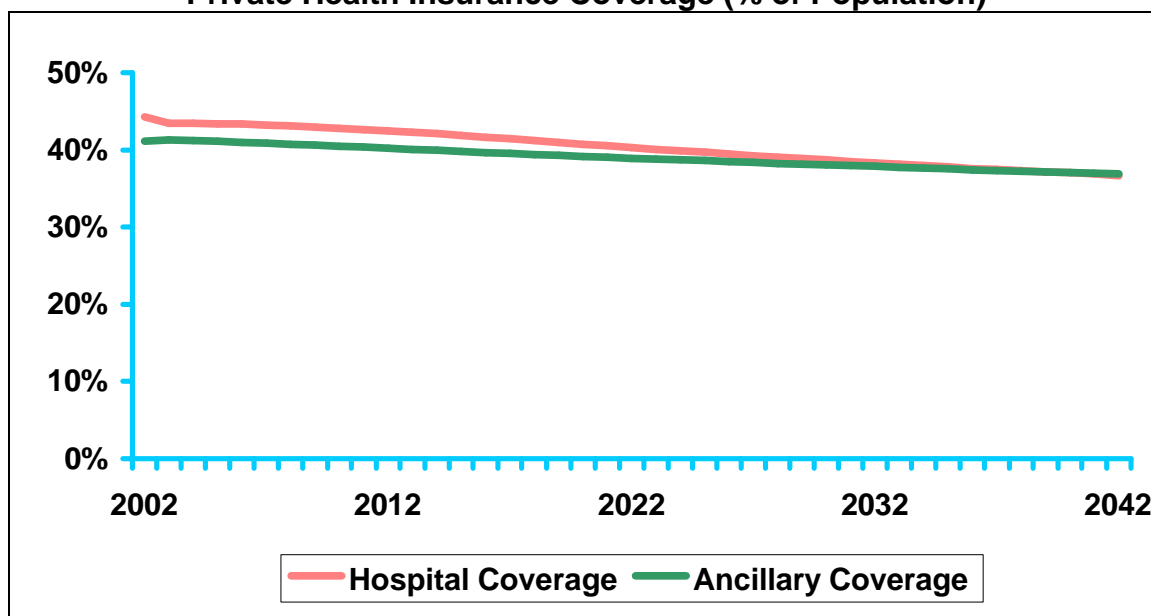
In response to declining PHI coverage, the Commonwealth Government recently successively introduced a 30 per cent rebate on PHI premiums and Lifetime Health Cover (LHC). The 30 per cent rebate encourages coverage by lowering net premiums.

LHC rewards early entry into hospital insurance with lower lifetime premiums than for later entry, and so recognises that younger people make less use of hospitals than older people. This has lessened the problem of age-based “adverse selection” under which older people dominated the hospital insurance pool, pushing up average benefits and premiums. In short, LHC helps make the market for PHI more actuarially fair for younger people.

In the baseline scenario, it is assumed that the 30 per cent rebate and LHC remain in place over the next forty years. The measures have supported a strong recovery in hospital coverage in recent years from a low of 30 per cent at end-1998 to 43 per cent in mid-2003. The baseline scenario aims to test whether PHI will continue to be sustainable under current policy arrangements.

Chart 4.7 shows that hospital coverage is projected to decline modestly from 43 per cent now to 37 per cent by 2041-42, which is still well above the lows of the late 1990s. This means that the current policy arrangements will ensure the sustainability of PHI for at least the next four decades.

Chart 4.7
Private Health Insurance Coverage (% of Population)



Source: GHC model

The projected decline for ancillary coverage is even more modest. It is projected to fall from 41 per cent now to 37 per cent in 2041-42, still leaving it well above the low of 31 per cent recorded at the close of 1998.

The very modest decline in ancillary coverage seen in the baseline scenario reflects an assumption that health prices rise faster than the overall CPI. This means that the dental and other health services that consumers purchase through ancillary cover have an increasing opportunity cost in foregone consumption of other goods and services, which are subject to a lower rate of price increase.

The same relative price effect is also operating to cause a very modest rate of decline in hospital cover. However, in the case of hospital cover there is also a second effect working to slowly reduce coverage, related to population ageing.

Before the introduction of LHC, ageing of the population was a serious threat to the long-term future of PHI. Younger members cross-subsidised the higher hospital benefits received by older members. As the population aged, the extent of the cross-subsidy increased as there were more older members in the pool whose benefits had to be financed from higher premiums paid by all. This steadily drove out younger members, which further reduced the average health of the insured pool and so pushed up premiums further.

LHC greatly mitigates these effects. However, it does not entirely eliminate the cross-subsidy of older members by younger members. Consequently, ageing of the population is still a negative for the PHI industry, although not nearly to the extent that it was pre-LHC. Because of the remaining cross-subsidy, ageing of the population means that real base hospital premiums (before loadings) are projected to grow at an average, annual rate of 2.3 per cent, exceeding non-demographic growth in real benefits of 1.6 per cent. This is the second effect responsible for the modest decline in hospital coverage seen in Chart 4.7.

Overall, while PHI coverage is projected to decline modestly between now and 2041-42 to reach 37 per cent for hospital and ancillary insurance, this still leaves coverage comfortably above the low point seen at the close of 1998, immediately before the introduction of the current policy arrangements. This means that the current policy arrangements, featuring LHC and the 30 per cent rebate, will ensure the sustainability of PHI for at least the next four decades. The next scenario considers the implications if these policy arrangements were to be overturned.

5. Recent Private Health Insurance Developments (Scenario 2)

Over the last five years, the Commonwealth Government has successively introduced a 30 per cent rebate on PHI premiums and Lifetime Health Cover (LHC) as incentives for individuals to take-up private health insurance. These are the core of the current policy arrangements supporting the PHI system. This section considers the question of what would happen if these recent policy initiatives were reversed, in particular, would the PHI system survive.

In this Section, a scenario is modelled in which these relatively new PHI policy arrangements are abolished. This “no rebate; no LHC” or “old policy” scenario represents a return to the policy arrangements that existed at the end of 1998. This scenario is designed to test whether the PHI system would be sustained if the recent policy initiatives were reversed.

The 30 per cent rebate was introduced on 1 January 1999. From then on, individuals with PHI have paid 70 per cent of PHI premiums, while the Commonwealth Government rebates the remaining 30 per cent. The rebate applies to both hospital and ancillary cover. It has the effect of lowering the net premiums paid by individuals thereby enhancing the attractiveness of PHI.

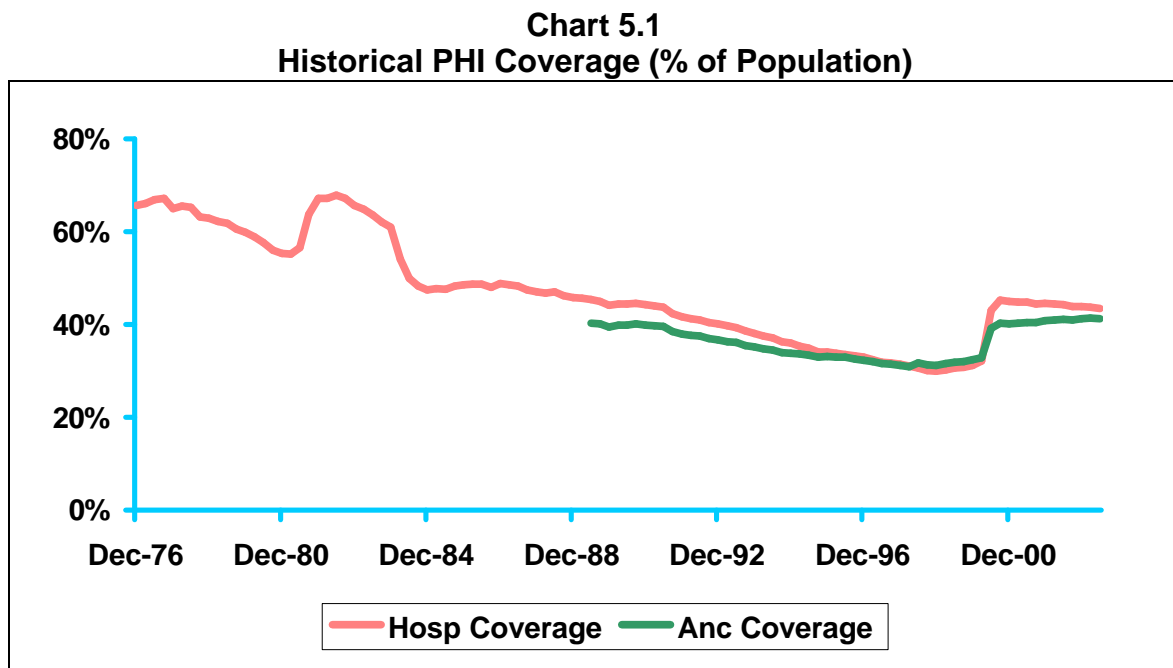
LHC was introduced for hospital cover on 15 July 2000⁸, and does not apply for ancillary cover. LHC rewards early entry into PHI with lower lifetime premiums than for later entry, and so recognises that younger people make less use of hospitals than older people. Specifically, individuals who join PHI after 15 July 2000 and are aged 30 to 65, pay a premium loading factor calculated from their age at entry to PHI. The loading factor steadily rises from zero for an entry age of 30 to 70 per cent for an entry age of 65. For example, an individual who enters PHI at age 55 pays a loading of 50 per cent indefinitely. This loading takes into account that the person was uninsured while aged 30-54, a time of relatively low expected hospital benefits.

The effect of LHC is to make the market for PHI more actuarially fair. Over the long-term, LHC will greatly reduce the extent to which premiums of young persons are used to cross-

⁸ LHC was originally to be effective from 1 July 2000 but this was extended to 15 July 2000 to give PHI funds sufficient time to process a flood of new members wishing to join ahead of the introduction of LHC.

subsidise the higher expected benefits of older persons. This makes PHI more attractive for young people than has been the case in the past.

Chart 5.1 shows hospital and ancillary coverage before and after the introduction of the 30 per cent rebate and LHC. In 1999 the 30 per cent rebate was introduced, followed by LHC in mid 2000, which again boosted PHI coverage. The chart shows that the apparent combined effect of the introduction of the 30 per cent rebate and LHC was to boost hospital coverage from 30 per cent at the close of 1998 to 43 per cent now.



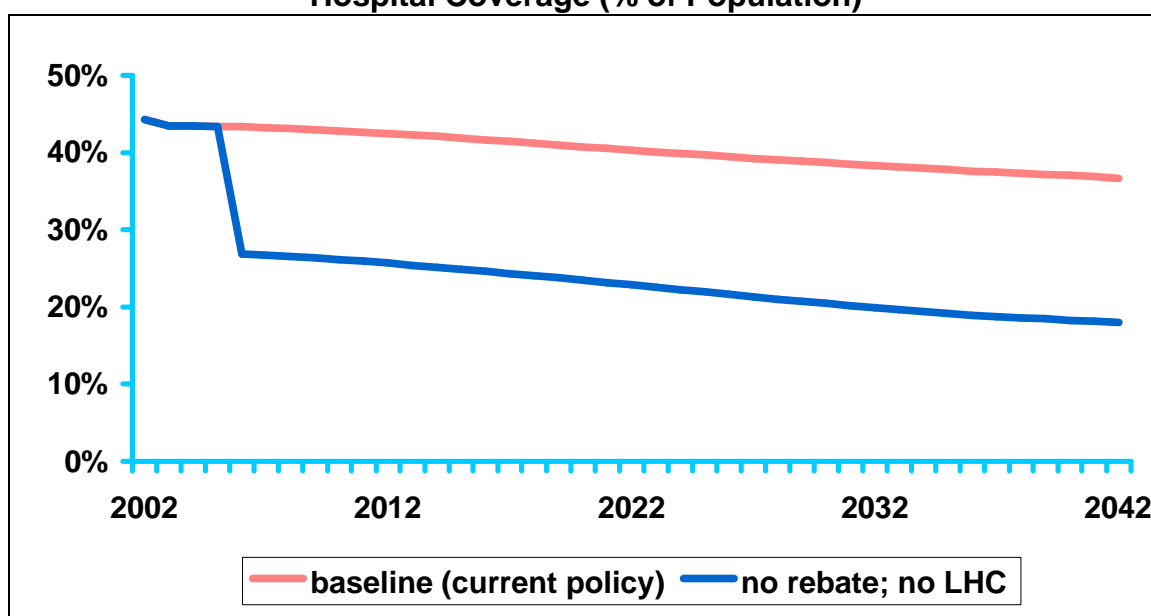
Source: PHIAC

The “no rebate, no LHC” scenario considers the effects if the 30 per cent rebate and LHC were abolished at some time in the future. This is to determine whether PHI would be viable in the long term without these policies. For illustrative purposes, the abolition date is assumed to be 1 July 2006.

As shown in Chart 5.2, without the 30 per cent rebate and without LHC, hospital coverage is projected to fall to only 18 per cent of the population by 2041-42 (“no rebate; no LHC” scenario). This is well below the low point in coverage of 30 per cent at the close of 1998, so that the PHI system would potentially not be viable. Since the viability of the PHI system is in question under this scenario, in reality this scenario may metamorphise into a scenario without a PHI sector, which is the next scenario, considered in section 6.

This contrasts with the baseline scenario, in which the existing policy arrangements are continued. As discussed in section four, in the baseline scenario hospital coverage is projected to remain solid over the next forty years, falling only slightly to 37 per cent (see Table 5.1). These results show that the combination of the 30 per cent rebate and LHC will maintain a solid level of coverage over the next forty years, whereas the viability of the PHI system will be threatened if these policy initiatives are reversed.

Chart 5.2
Hospital Coverage (% of Population)



Source: GHC model

Table 5.1

Coverage rates under old and new PHI policies (% of population)

	1997-98	2002-03	2006-07	2041-42
old policy (no rebate; no LHC):				
hospital	31%		27%	18%
ancillary	32%		30%	26%
new policy (rebate and LHC):				
hospital		43%	43%	37%
ancillary		41%	41%	37%

The loss of coverage projected by the GHC model takes into account both the direct and indirect impacts of “no rebate, no LHC”. The direct effect is an increase in premiums of 43 per cent, as the share of premiums paid by individuals rises from 70 to 100 per cent. However, the loss of rebate and LHC severely reduces the attractiveness of PHI to younger

people. The resulting ageing of the insured pool pushes up average benefits, leading to a second round rise in premiums due to this indirect effect. The combination of direct and indirect effects is responsible for hospital coverage falling to a low 18 per cent by 2041-42.

Chart 5.2 also shows that there is an ever widening shortfall in coverage in the “no rebate, no LHC” scenario compared with the “baseline” scenario. This is due to the abolition of LHC. Without LHC, there is a major cross-subsidy of older members by younger members. As the population ages, the extent of the cross-subsidy increases as there are more older members in the pool whose benefits have to be financed from higher premiums paid by all. This steadily drives out younger members, which further reduces the average health of the insured pool and so pushes up premiums further, driving down coverage even more.

The modelled level of government health costs under this “no rebate; no LHC” scenario are similar to the level under the baseline scenario (at 12.2 versus 12.0 per cent of GDP). However, the viability of the PHI system is in serious question under this scenario, so in reality it may metamorphise into a scenario without a PHI sector, which is now examined. As we shall see, under this “no PHI” scenario there is a significant increase in government health outlays.

6. Do we need Private Health Insurance? (Scenario 3)

The preceding section indicated that if the current policy initiatives to support PHI are withdrawn, coverage would fall to very low levels, threatening the collapse of the PHI system. This section considers what would happen if the PHI industry were to disappear because of lack of government support in the future. In particular, it addresses what the effect would be on government budgets. This “no PHI” scenario has been considered previously by Harper.

Under a scenario in which there is no private health system, PHI funds are no longer a source of health funding, leaving gaps in the funding of hospital and ancillary services. In the GHC model, these funding gaps are filled by the other funding sources, according to their existing relativities in non-PHI funding for each type of health service. For example, the hospital costs previously funded by PHI are taken up mainly by government (91 per cent) and only partly by the private sector. On the other hand ancillary costs previously funded by PHI, are mainly taken up by the private sector (80 per cent) and only partly by government.

The overall effect of these funding shifts is that government replacement spending fills a substantial part of the health funding gap left by the disappearance of PHI benefits. This replacement spending needs to be balanced against the saving to government from no longer paying a 30 per cent premium rebate with the disappearance of PHI. This involves considering the relationship between PHI benefits, PHI premiums and the 30 per cent rebate on the one hand, and PHI benefits and government replacement spending on the other hand. These are now considered in turn.

The first panel in Table 6.1 shows how the income generated from premiums is projected to be distributed in 2006-07. It shows that 83 cents of every \$1 of premium income is used to pay health benefits to members. A further nine cents covers administrative expenses and a further eight cents goes toward “other” (profit net of non-premium income). The second panel of the table simply shows that the Commonwealth Government contributes \$0.30 to each \$1 of premium through the rebate. The remaining 70 cents is contributed by individuals who take out PHI, and hence help fund the health system, relieving pressure on government health outlays.

Table 6.1
2006-07 Allocation and Gov't Contribution of \$1 Premium

	total
PHI (a):	
benefits	\$0.83
admin	\$0.09
other	\$0.08
premium	\$1.00
Government (b):	
rebate	\$0.30

Source: GHC model, PHIAC, AIHW

(a) allocation of \$1 premium

(b) contribution to \$1 premium by government

Table 6.1 shows that for every 30 cents of government rebate, there is 83 cents in PHI benefits. The key question is to what extent the health funding gaps left by withdrawal of these benefits under the “no PHI” scenario would be filled by government replacement expenditure.

Table 6.2, derived from the GHC results for the “no PHI” scenario, identifies the government replacement expenditure as 60 cents per dollar of PHI premium. This represents part, but not all, of the 83 cents in PHI benefits that are no longer paid out under the “no PHI” scenario. Most of the remaining funding gap of 23 cents in PHI benefits is filled by the private sector, although there is a small net saving in administration costs from the transfer of sources of health funding.

So if PHI disappears, for every dollar of PHI premium, the government saves 30 cents in rebate but incurs 60 cents in replacement expenditure, leaving a net increase in government health outlays. Before considering the effects on government outlays, this result also leads to an important point about equity. The net addition to government outlays arises because governments spend more on health services for the uninsured than the insured. So when people drop insurance, the government experiences a net increase in its outlays. In fact, for every one dollar the government spends in rebate for an insured person, it spends two dollars in meeting the health needs of an uninsured person (this represents the ratio of the 30 cents rebate per dollar of premium to the 60 cents in replacement spending per dollar of the same premium). Yet insured and uninsured persons contribute on the same basis to funding government health outlays through the Medicare levy and general taxation. So the 30 per cent rebate represents a modest government contribution to the health costs of the insured.

Harper (2003) makes a similar point. Specifically, he finds that for every \$1 of rebate spent by government under the existing policy arrangements, the government avoids \$2 of government replacement spending under a scenario without PHI. Harper's figuring is shown in the bottom panel of Table 6.2.

Table 6.2
2006-07 Without PHI: Gov't replacement/rebate ratios

	total
PHI:	
benefits	\$0.00
admin	\$0.00
other	\$0.00
premium	\$0.00
Government (a):	
rebate	\$0.00
government expenditure	\$0.58
government admin	\$0.01
government total	\$0.60
replacement/rebate (b)	2.0
Harper:	\$bn
rebate	2.1
government PHI replacement	4.3
replacement/rebate	2.0

Note: all estimates refer to 2006-07 and assume the disappearance of private health insurance

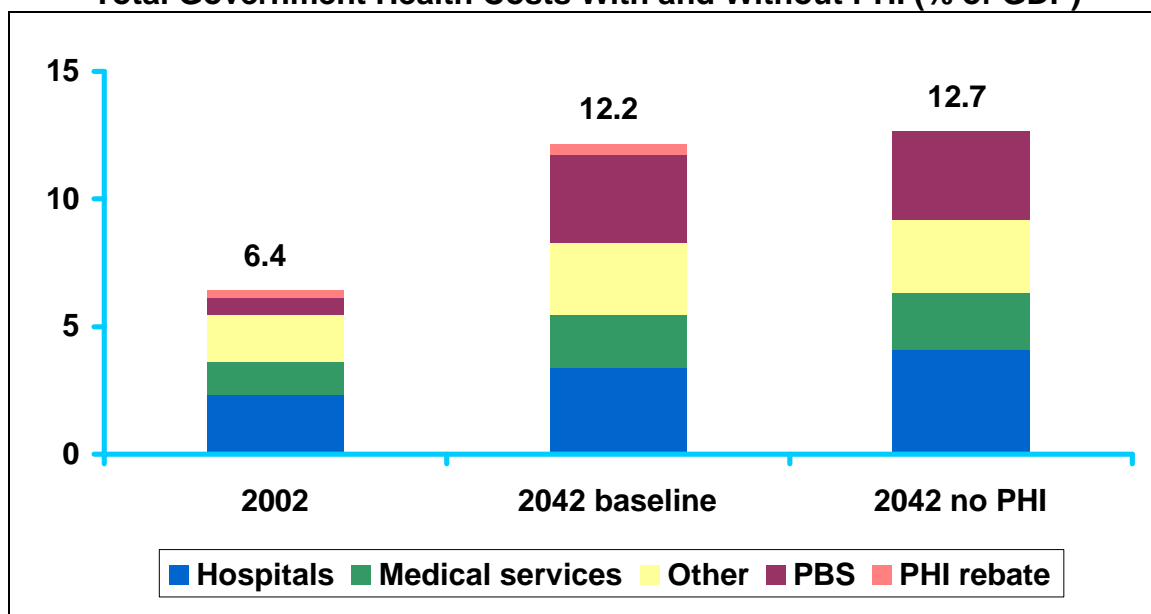
(a) Replacement expenditure by government of \$1 premium under existing arrangements

(b) The replacement/rebate ratio is calculated as rebate (30 cents in the dollar) / government total expenditure (60 cents in the dollar in total)

Harper's estimates, reported in "Preserving Choice: A Defence of Public Support for Private Health Care Funding in Australia"⁹ are consistent with our results, the implied replacement ratio (replacement government expenditure to rebate) being 2.0 in both cases.

⁹ Harper, *Preserving Choice: A Defence of Public Support for Private Health Care Funding in Australia*, 2003

Chart 6.1
Total Government Health Costs With and Without PHI (% of GDP)



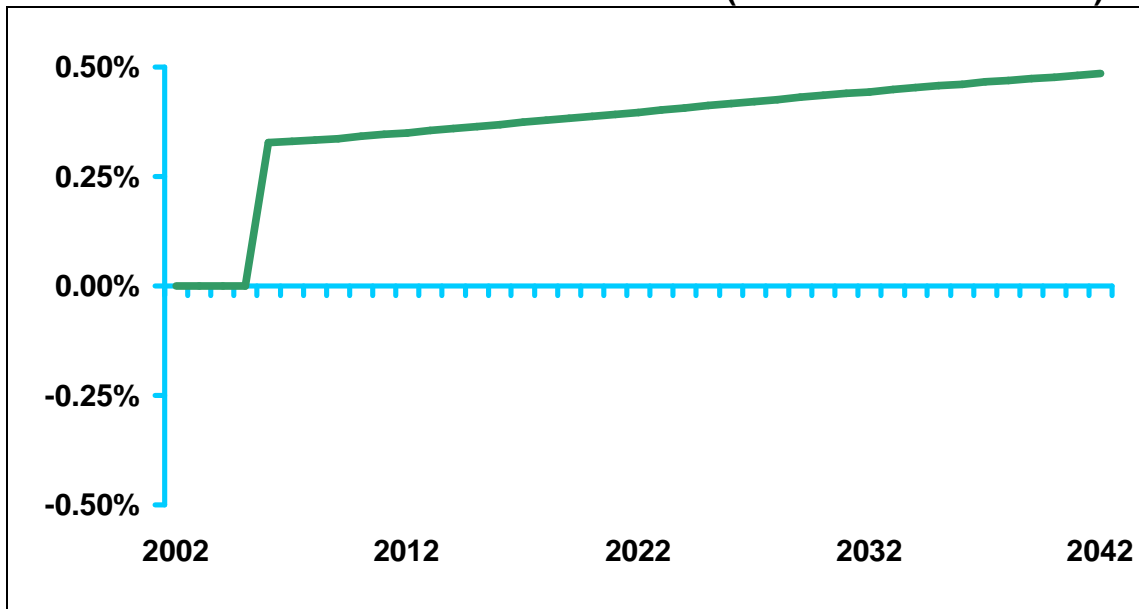
Source: GHC model

Note: "Other" includes non-PBS pharmaceuticals, high-level residential aged care, ancillary, miscellaneous and administration health costs.

Chart 6.1 shows the effects of this cost shifting to government under the "no PHI" scenario on total government health costs. Commonwealth and State governments together already face an enormous jump in health outlays from 6.4 per cent of GDP in 2001-02 to 12.2 per cent in 2041-42. If PHI were to disappear, the jump would be even higher to 12.7 per cent of GDP. This represents an additional rise of 0.5 percentage points of GDP. While the government would "save" 0.4 per cent of GDP from the disappearance of the rebate (represented in pink in Chart 6.1), this would be outweighed by additional health outlays of 0.9 per cent of GDP in areas vacated by PHI benefits, especially hospitals.

Chart 6.2 shows the net impact on government health costs rising from year-to-year under the "no PHI" scenario compared to the "baseline" scenario. The disappearance of PHI causes an initial jump in government health costs. Thereafter the extra spending continues to mount, even when expressed relative to GDP. This is mainly because the disappearance of a growing private hospital sector would put growing pressure on the public hospital system. By 2041-42, the net additional to government health outlays reaches 0.5 per cent of GDP, as already implied by Chart 6.1.

Chart 6.2
Total Government Health Costs Without PHI (deviation from baseline)



Source: GHC model

These results show the significant and rising pressure that would be placed on government budgets from the disappearance of PHI. Even though the government would “save” 0.4 per cent of GDP from the disappearance of the rebate, this would be outweighed by additional health outlays of 0.9 per cent of GDP in areas vacated by PHI benefits, especially hospitals. This conclusion is almost identical to that reached in the earlier report by Harper. This adverse outcome for government reflects the fact that for every 50 cents the government spends in rebate for an insured person, it spends one dollar in meeting the health needs of an uninsured person.

As seen in section 5, any reversal of the current policy arrangements involving the 30 per cent rebate and LHC will ultimately reduce coverage to the point where the PHI system may collapse, leaving government in the more difficult budget situation of the “no PHI” scenario.

7. Conclusions

This Report finds that private health insurance (PHI) plays a significant role in addressing the concerns about burgeoning future government health outlays that are raised in the IGR.

Under current policy arrangements, hospital coverage is projected to decline modestly from 43 per cent now to 37 per cent by 2041-42, which is still well above the lows of the late 1990s. This means that *if the Commonwealth were to do nothing more than maintain the 30 per cent rebate and LHC in their current form, the viability of the PHI system would be assured for at least the next four decades.*

In contrast, *if the 30 per cent rebate and LHC were removed in the future, PHI coverage would fall to unprecedented low levels, making it potentially unviable.* Specifically, hospital coverage is projected to fall to only 18 per cent of the population by 2041-42. Since the viability of the PHI system is in question under this scenario, in reality this scenario may metamorphise into a scenario without a PHI sector.

If there were no PHI in Australia, governments would spend collectively about twice as much (0.9 per cent of GDP) on meeting the cost of the necessary expansion of public health services as the Commonwealth would save (0.4 per cent of GDP) by no longer having to pay the 30 per cent rebate.

Finally, there is also an important issue of fairness in the government's relative treatment of insured and uninsured persons. Under the current policy arrangements, the government contributes 30 cents in every dollar of PHI premiums through the rebate. However, the insured person contributes the remaining 70 cents, and so helps fund the health system, relieving pressure on government health outlays. In fact,

for every one dollar the government spends in rebate for an insured person, it spends two dollars in meeting the health needs of an uninsured person that could otherwise be covered by PHI benefits.

Yet insured and uninsured persons contribute on the same basis to funding government health outlays through the Medicare levy and general taxation. So the 30 per cent rebate represents a modest government contribution to meeting the health costs of the insured, compared with the uninsured.

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Appendix: Government Health Costs (GHC) Model

A1. Introduction

Section two of the main report provides an overall perspective on the GHC model. This Appendix describes in more detail the two modules that make up the GHC model. These are the Health Costs (HC) module and the Private Health Insurance (PHI) module.

A2. Health Costs Module

The overall function of the HC module is to project spending on eight categories of health services according to six funding sources. The eight categories of health services and the six funding sources are identified in section two of the main report.

The historical data on spending on health services by funding source is from the AIHW. There is one exception, which arises because Commonwealth Government spending is shown only as a single category in the AIHW data. This was split between direct spending and spending via grants to the states and territories using information in Commonwealth Government budget papers.

HC Module Data Sources

Australian Institute of Health & Welfare (AIHW)

health funding by source by service: 1993-94 to 2001-02

AIHW

health services per capita by gender by age group: 1993-94

Intergenerational Report (IGR)

real growth in health services per capita by age group: average annual growth to 2041/42

Econtech

population by gender by age: June 30 each year to 2042

The HC module is used to model total health costs, and to allocate non-PHI funded health costs between the other five funding sources. These two steps are now described in turn in more detail.

A2.1 Total Health Costs

The first step in the modelling process is to project demand for health services for each of the eight types of services. Hospitals can be used as an illustration of the method that has been used.

Hospital Expenditure

$$\text{Hospitals}[t]/\text{Hospitals}[0] = \{ \text{CPI}[t] \times \sum R[t,x,g] \times \text{Pop}[t,x,g] \} / \{ \text{CPI}[0] \times \sum R[0,x,g] \times \text{Pop}[0,x,g] \}$$

$R[t,x,g]$ = real per capita spending on hospitals in year t for age group x and gender g

$\text{CPI}[t]$ = Consumer Price Index in year $[t]$, as projected in the IGR

$\text{Hospitals}[0]$ and $R[0,x,g]$ from AIHW

annual growth in $R[t,x,g]$ from IGR

Pop projection from Econtech (similar to IGR)

The methodology that has been used is similar to that employed in the IGR and is shown in the box above. Real hospital costs are modelled by age by gender. Base levels for nominal hospital costs by gender by age in 1993/94 were obtained from the AIHW. These base levels were then converted to real terms by deflating by the CPI. Real hospital costs by gender by age were then forecast to grow at an annual rate of 1.64 per cent, in line with the IGR. These real hospital costs by gender by age were then applied to Econtech's projection of the population by gender by age, which is similar to that contained in the IGR, being based on similar fertility and migration assumptions. Finally, hospital costs were aggregated over gender and age groups and then converted to nominal terms using the IGR's projection for the CPI.

A similar approach was used for projecting costs of most other health services. This includes PBS and non-PBS pharmaceuticals services, high-level residential aged care services, ancillary services and miscellaneous services. The only exceptions to this approach were for medical services and administration services.

The cost of medical services is projected in a similar way to that of hospitals but with one refinement. As in the IGR, the annual rate of growth in real medical costs by age by gender is age-specific rather than uniform across all ages.

Administration costs are projected using a constant expense ratio for each funding sector. The expense ratio is calculated as the ratio of administration costs to total expenditure on health services. For example, in the case of PHI the expense ratio is calculated as the ratio of administration costs to payment of PHI benefits.

A2.2 Funding of non-PHI Health Costs

After the first step determines total demand/spending for each type of health service, the second step (described in section A3) determines the portion of this demand that is met by PHI benefits. The remaining portion is then met by other funding sources, according to existing (2001/02) relativities, as shown in the box below, which uses hospital funding as an illustration.

Hospital Funding

$$\text{Hospitals}[t,\text{source}] = \text{Hospitals ratio}[\text{source}] \times \{\text{Hospitals}[t] - \text{Hospitals}[t,\text{PHI}]\}$$

Source = Commonwealth direct, Commonwealth grants to states, state & local government, individuals, other

A3. PHI Module

A3.1 Introduction

The purpose of PHI module is to project PHI benefits as the middle step of the modelling process. These benefit levels by type of health service are then fed into the HC module to determine the balance of health funding to be met from other (non-PHI) funding sources.

The major driver of PHI benefits is PHI coverage. Coverage rates have been modelled in detail, according to the type of cover (hospital and ancillary), gender and age group, and taking into account the driving role of the balance between premiums and expected benefits. Data on PHI coverage and benefits has been sourced from PHIAC as detailed in the box.

PHI Module Data Sources

Public Health Insurance Administration Council (PHIAC)

coverage by age group by gender

benefits by age group by gender

time span of historical data:

for hospital

September quarter 1997 to June quarter 2003

for ancillary

September quarter 2002 to June quarter 2003

A3.2 Coverage Rates

Coverage rates are modelled in detail, according to two types of cover (hospital and ancillary), both genders and 14 age groups (extending from 20-24 through to 80-84 and 85 and over), giving a total of 56 equations. The form of the coverage equation is shown in the box below.

Coverage equations

$$\text{logit}(\text{cov_hospital}[x,g,t]) \equiv \ln(\text{cov_hospital}[x,g,t]/(1-\text{cov_hospital}[x,g,t])) =$$

$$a[x,g,t] + b^*(\text{premium_hospital}[x,g,t]/\text{CPI})/(\text{benefits_hospital}[x,g,t]/\text{CPIhealth})$$

$$\text{logit}(\text{cov_ancillary}[x,g,t]) \equiv \ln(\text{cov_ancillary}[x,g,t]/(1-\text{cov_ancillary}[x,g,t])) =$$

$$c[x,g,t] + d^*(\text{premium_ancillary}[x,g,t]/\text{CPI})/(\text{benefits_ancillary}[x,g,t]/\text{CPIhealth})$$

$\text{cov}[x,g,t]$ = coverage rate for age group x, gender g and year t

$\text{premium}[x,g,t]$ = effective premium net of rebate per insured adult for age group x, gender g and year t

$\text{benefits}[x,g,t]$ = expected benefit per insured adult for age group x, gender g and year t

b,d = parameters representing sensitivity of logit(coverage) to the balance between effective premiums and expected benefits for hospital and ancillary coverage respectively

The sensitivity of coverage to premium/benefits is difficult to estimate – there have been frequent structural changes that have affected the private health system. Therefore, instead of

estimating “b” (sensitivity of hospital coverage to premium/benefits) directly, it has been modelled indirectly in the GHC model via age. The indirect equation used to estimate “b” is:

$$\begin{aligned} &\text{sensitivity of logit(coverage) to age [1]} = \\ &\text{sensitivity of logit(coverage) to premium/benefit [2]} * \\ &\text{sensitivity of premium/benefits to age [3]} \end{aligned}$$

In this approach the age-related parameters of [1] and [3] were estimated to calculate [2].

The estimate for [1], the sensitivity of coverage to age, was derived from John Wilson (1999), “An Analysis of PHI Membership in Australia”. Wilson used cross-sectional data to estimate a logit equation for PHI coverage. Table B1 shows the parameter for ages estimated by Wilson. This implies that each year of age by itself adds 0.035 to the logit of coverage.

Table B1

Sensitivity of logit(coverage) to age, taking other factors into account (Wilson, 1999)					
	25-34	35-44	45-54	55-64	per year of age
Age group effect	-0.1848	0.2346	0.3663	0.8540	0.035

The estimate for [3], the sensitivity of the premium/benefit ratio to age, was obtained using a simple regression with age and gender as independent variables. The age parameter of this regression was -0.056, implying that each year of age reduces premium/benefits by 0.056.

The parameter “b” can now be calculated. The sensitivity of the logit of coverage to premium/benefit = $0.035 / -0.056 = -0.6$.

The parameter “d” was chosen so that the model accurately predicts the combined effects on ancillary coverage of the introduction of lifetime health cover and the 30 per cent rebate. The “intercept” parameters, “a” and “c” were chosen so that each equation accurately predicts actual coverage rates by age by gender in June 2003.

A3.3 Lifetime Health Cover

The GHC model is designed to take into account the Lifetime Health Cover (LHC) system and its effects on coverage. The purpose of Lifetime Health Cover (LHC) is to reduce the extent of adverse selection in the insurance pool by taking into account in setting premiums that expected benefits depend on age. This objective could have been achieved by basing premiums on the current age of those in the insured pool or their entry age to the pool.

The current age approach is the more straightforward. Premiums by current age could be determined as a mark up on expected benefits by current age.

Current-Age Premiums

$$PC \times RC_x = kc \times B_x \quad [1]$$

where:

x = age

PC = base current age premium

RC_x = current age premium loading multiple

B_x = expected benefits at age x

kc = current age premium mark-up factor

LHC is in fact based on the entry age approach. In an actuarially fair system, the entry age loadings multiple would be set so that the present value of expected future premiums is a markup on the present value of expected future benefits. The calculation of entry-age premiums in the following box is similar to Gale and Brown (2003).

Equation [5] is derived for a “funded” system but could be applied to an “unfunded” system after modifying the entry-age premium mark-up factor, “ke”. This distinction between a “funded” and “unfunded” system arises under an entry age system but not under a current age system. Under an entry age system, benefits are expected to be less than the premium in the early years of insurance, but are expected to exceed the premium as the insured person ages and makes more use of hospitals. Under an “unfunded” system, planned total premium income (and in turn the base premium) for a year is derived from expected benefits in that year. Under a “funded” system the base premium also makes allowance for the higher level of benefits expected in future years as insured persons age i.e. there is a pre-payment

component. In terms of equation [5], this lower base premium, PE, under an unfunded system, could be achieved by setting the entry-age premium mark-up factor, “ke”, to be lower than under a “funded” system, such that planned total premium income for a year bears the desired relationship to expected benefits in that year. However, the premium loadings, RE_x , may be the same for both funded and unfunded systems.

Entry-Age Premiums

$$PV(\text{premiums}) = PE \times RE_x \times \sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \quad [2]$$

$$PV(\text{benefits}) = \sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \times B_{x+t} \quad [3]$$

$$PV(\text{premiums}) = ke \times PV(\text{benefits}) \quad [4]$$

Using [2] and [3] in [4] and simplifying gives the entry age premiums in [5].

$$PE \times RE_x = \left\{ ke \times \sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \times B_{x+t} \right\} / \left\{ \sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \right\} \quad [5]$$

where:

PE = base entry age premium

RE_x = entry age premium loading multiple

i = individuals' expected rate of inflation in premiums and benefits

d = individuals' discount rate

ke = entry-age premium mark-up factor

Gale and Brown (2003) find that LHC is approximately actuarially fair. However, because it is not precisely fair, there are discrepancies between the actuarially fair entry age loading multiples that can be calculated using equation [5], and the entry age loading multiples that apply in practice. To avoid such discrepancies, the GHC model is based on the loadings that apply in practice. These actual loading multiples rise smoothly in annual steps of 2 percentage points from a 100 per cent multiple (i.e. no loading) at age 30 to a 170 per cent multiple at age 65 per cent.

A literal modelling of the entry age system would introduce complexities to the GHC model that are unwarranted for the general purpose of this report of generating scenarios for government PHI policy and health costs. The PHI module is sufficiently complex for these general purposes. It projects 56 groups of persons with health insurance, where the different

groups are distinguished by two types of insurance, two genders and 14 age groups. Further, these 56 groups are projected over 40 single years, extending to 2041-42. This makes GHC far more sophisticated than comparable models that have been used to assess government health and PHI policy. A literal modelling of entry age premiums would require a further distinction, based on entry age, which would increase the number of groups from 56 to 420. Such an extension would be important for a model that is designed to produce detailed projections of the PHI industry for business planning purposes, but not for a model with the general policy purposes of the GHC model.

Instead, the GHC model proxies the LHC system of basing premium loadings on entry age with an actuarially equivalent system of basing premium loadings on current age. The current age loadings are actuarially equivalent to the entry age loadings in the sense that the hypothetical age profile of benefits under which the entry age loadings would be actuarially fair is used to construct the current age loadings.

Of course the actual age profile of expected benefits will differ from this hypothetical age profile of expected benefits. This is because the LHC entry age loadings are not precisely actuarially fair. However, since the current age loadings are based on the same hypothetical age profile of expected benefits as the entry age loadings, both systems of loadings will depart from fairness to the same degree. Therefore, in theory at least, the current age loadings system may deliver the same degree of effectiveness in countering age-based adverse selection as the LHC entry age loadings. It is therefore reasonable, particularly for our general purposes, to proxy the entry age loadings system with an actuarially equivalent current age system.

The formula for converting entry age loadings to actuarially equivalent current age loadings is derived in the box below as equation [11].

Current-Age Premiums as a Function of Actuarially Equivalent Entry Age Premiums

Equation [5] for entry age premiums was derived in the previous box and is reproduced below. However, RE_x is now interpreted as the actual entry age loadings under LHC and B_x as the hypothetical expected benefits under which those actual loadings would be actuarially fair.

$$PE \times RE_x = \{ke \times \sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \times B_{x+t}\} / \{\sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t}\} \quad [5]$$

From equation [5], the equivalent equation for someone aged $x+1$ is as given in equation [6].

$$PE \times RE_{x+1} = \{ke \times \sum_{t=0}^{w-x-1} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t+1} \times B_{x+t+1}\} / \{\sum_{t=0}^{w-x-1} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t+1}\} \quad [6]$$

Equation [7] simply re-indexes the summations in equation [6].

$$PE \times RE_{x+1} = \{ke \times \sum_{t=1}^{w-x} \frac{(1+i)^{t-1}}{(1+d)^{t-1}} \times L_{x+t} \times B_{x+t}\} / \{\sum_{t=1}^{w-x} \frac{(1+i)^{t-1}}{(1+d)^{t-1}} \times L_{x+t}\} \quad [7]$$

The numerator and denominator can be multiplied by the same factor of $(1+i)/(1+d)$.

$$PE \times RE_{x+1} = \{ke \times \sum_{t=1}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \times B_{x+t}\} / \{\sum_{t=1}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t}\} \quad [8]$$

Equation [9] expands equation [5] for the entry-age premium of someone aged x .

$$PE \times RE_x = \{ke \times [L_x \times B_x + \sum_{t=1}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \times B_{x+t}]\} / \{\sum_{t=0}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t}\} \quad [9]$$

Comparing equations [8] and [9], they both contain the same summation involving B_{x+t} . Substituting out for this summation and simplifying gives equation [10], involving the entry age premiums at age x and $x+1$.

$$ke \times L_x \times B_x = L_x \times PE \times RE_x + \sum_{t=1}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times L_{x+t} \times [PE \times RE_x - PE \times RE_{x+1}] \quad [10]$$

The final step is to use equation [1] for current age premiums to eliminate B_x and then simplify.

$$PC \times RC_x = (kc / ke) \times \{PE \times RE_x + \sum_{t=1}^{w-x} \frac{(1+i)^t}{(1+d)^t} \times \frac{L_{x+t}}{L_x} \times [PE \times RE_x - PE \times RE_{x+1}]\} \quad [11]$$

The final equation in the box, equation [11], is the premiums conversion equation for a person of a given age, x . It expresses the current age premium in terms of the entry-age premium. The first term allows for the possibility of a different mark-up factor between the entry-age and current age systems. Abstracting from that complication, the interpretation of the equation is straightforward. It simply states that the current age premium equals the entry age premium plus a negative adjustment if the entry age premium loading at entry age $x+1$ exceeds that at age x . So the current age premium in the first year of insurance is less than the entry age premium for that year if there would have been a rise in the premium loading from deferring entry to the following year.

Equation [11] has been used to translate entry age premium loadings, RE_x , to actuarially equivalent current age premium loadings, RC_x , for use in the coverage equations. Thus it is only used to determine relative premiums across age groups. Because the current system is unfunded, total premiums are determined beforehand as a markup on total current benefits. The PHI module solves for the level of base premium, PC that delivers this required level of total premiums, given the current age premium loadings, RC_x .

Note that the derivation of equation [11] confirms that our conversion of premium loadings does not rely on premiums being actuarially fair. Indeed, equation [11] does not involve benefits at all, but simply relates current age loadings to entry age loadings. As noted above, the current age loadings will be actuarially fair to the same extent as the entry age loadings. This is because both systems of loadings are actuarially fair under the same hypothetical age profile for expected benefits. This is the profile that satisfies equation [5] after the actual entry age loadings are inserted on the left-hand side. The current age loadings in equation [11] are consistent with the same hypothetical age-profile for benefits, making the two systems actuarially equivalent in that sense.

If in the future the PHI rebate were to vary by age then equation [11] would need to be applied carefully. In particular, age-specific rebates would need to be applied before the premium conversion from entry age to current age, not after.

No allowance was made for the complication that LHC is grandfathered, but this has little impact. Under grandfathering, those aged over 30 on 15 July 2000 and with continuous

cover from that date are exempt from loadings that would otherwise apply. Given the long 40-year horizon of this study, the transitional complications from grandfathering are small – on a rough estimate the grandfathered group will account for only about 10 per cent of the insured population by 2041-42. In any case, grandfathering is a cross-subsidy of the grandfathered group by the non-grandfathered group of insured. It will encourage the grandfathered group to remain insured, while discouraging others from taking up or maintaining their coverage. In this zero-sum game there is no presumption that the effect on total coverage will be positive or negative.

Under an entry-age system, someone exiting faces the penalty of a higher loading on any subsequent re-entry. This acts both as a barrier to entry and exit compared with a current age system. This means that turnover is likely to be less than under a current age system and so the dynamics of membership will be different. However, it is clear from economic principles that this barrier to both entry and exit will have a net effect in either direction on coverage levels in the long-term, relative to the actuarially equivalent current age system contained in the GHC model.

In summary, the current age loadings in the GHC model are based on the same hypothetical age profile of expected benefits as implied by the LHC entry age loadings, so both systems of loadings will depart from fairness to the same degree. Therefore, in theory at least, the GHC current age loadings system may deliver the same degree of effectiveness in countering age-based adverse selection as the LHC entry age loadings.

A3.4 Premiums and Benefits

In the PHI module, PHI benefits are projected separately for each of four types of health services. For example, benefits for hospital insurance relate partly to hospital services and partly to medical services performed in hospitals. Payments for both of these services are projected separately. Similarly, benefits for ancillary insurance relate mostly to ancillary services but a small component refers to non-PBS prescription medicines. Again, payments for both of these services are projected separately.

The method for projecting benefit payments for health services can be illustrated using hospital service benefits as an example. This method is again similar to that used in the IGR.

Hospital benefits per insured person by age by gender in 2002-03 are available from PHIAC, and these were split between medical and hospital services using AIHW data. The hospital service benefits were then projected forward using the IGR assumption that real hospital expenditure per person by age grows at an annual rate of 1.64 per cent. These benefits are then aggregated over genders and ages to project total benefits for hospital services, as shown in the box below.

Hospital Service Benefits

$$\text{HBenefits}[t]/\text{HBenefits}[0] = \{ \text{CPI}[t] \times \sum \text{RBH}[t,x,g] \times \text{InsH}[t,x,g] \} / \{ \text{CPI}[0] \times \sum \text{RBH}[0,x,g] \times \text{InsH}[0,x,g] \}$$

$$\text{InsH}[t,x,g] = \text{cov_hospital}[x,g,t] \times \text{pop}[x,g,t]$$

$\text{RBH}[t,x,g]$ = real spending on hospital service benefits per person with hospital cover in year t for age group x and gender g

$\text{CPI}[t]$ = Consumer Price Index in year $[t]$, as projected in the IGR

$\text{InsH}[t,x,g]$ = number of persons with hospital cover in year t for age group x and gender g

$\text{HBenefits}[0]$ and $\text{R}[0,x,g]$ from PHIAC and AIHW
annual growth in $\text{RBH}[t,x,g]$ from IGR (1.64%)

As noted above, in the PHI module, aggregate premiums for both types of cover are modelled as a mark-up on aggregate benefits. That is, an unfunded system is modelled.