# AGENDA

## A Journal of Policy Analysis and Reform

**Volume 18, Number 2, 2011 — Health Economics Special Issue**

## Contents

# The Platypus Economist

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A good health economist is a bit like a platypus, or at least so-says a health economist colleague of mine.[2] The friendly beast must combine a clinician's medical knowledge with an economist's techniques, both theoretical and empirical, and a bureaucrat's understanding of the administrative structures within which policy operates. Perhaps the health economist's empirical techniques are not as refined as the theoretical econometrician's, just as the platypus's fur is perhaps not quite as soft as that of a kitten, but it does a good job of combining a set of characteristics that are normally not found in one place. Unfortunately, health policy instead seems set by a chimera that rather seems to have taken the design specifications for the platypus and decided that the kitten should in fact provide the beak and the duck provide the fur: we too often find combined the clinician's goal of health care, as maximand; the economics undergraduate's captivation by partial equilibrium and neglect of general equilibrium; and the bureaucrat's inadequate respect for methodological individualism. The papers in this *Agenda* Special Issue on health economics work to bring more standard economic method back into health policy analysis.

Harrison and Robson lead off by skewering one of the worst such recent chimeras: Australia's National Preventative Health Taskforce. Yes, health is a good thing; but it is hardly the only possible element in individual utility functions. Setting health as maximand and taking privately borne costs of ill-health as evidence of individual irrationality or information failure is unlikely to yield policy consistent with good welfare economics. Thus the Taskforce cites smoking as generating more than $30 billion per year in 'costs to the economy' by relying on a study that, by assuming away private consumption benefits of smoking, deems privately borne costs to be social loss. The same report deems that alcohol costs Australia some $15 billion per year; application of more standard method shows that less than $4 billion of that figure consists of costs properly viewed as external, with the rest being borne by the drinker himself — and those private costs sometimes double-counted.[3] But big numbers presented as 'costs' imposed on the country rather than borne by the consumer help to build a sense of public crisis that fuels demand for initiatives like the National Preventative

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2 I thank Andrea Menclova for the initial analogy. Defamation complaints from health policy architects ought, however, to be directed to me alone.

3 Crampton, E., Burgess, M., and Taylor, B. 2011, 'The Cost of Cost Studies', University of Canterbury Economics Department working paper.

Health Taskforce. The subsequent papers each take on different aspects of the interaction between the market for private health insurance and the Australian public insurance program, Medicare.

Robson, Ergas and Paolucci take on the Medicare Levy Surcharge [MLS]. A naïve economic analysis would suggest such levies are a nice way of ensuring that those who can afford their own healthcare either pay for it themselves or compensate the government for their use of the public health system. Robson *et al*. instead use standard price theory to show that, because many wealthy people would optimally self-insure a higher proportion of their health risks in the absence of the MLS, the MLS can have the perverse effect of reducing those consumers' private health insurance purchases if wealth effects are large or, alternatively, of buying more insurance than would have been optimal in order to avoid the MLS.

Paolucci, Butler and van de Ven build on the analysis of Robson, Ergas and Paolucci to argue that the combination of Medicare and private health insurance yields inefficient duplication in coverage and that purchasers of private health insurance ought to be allowed to opt out of Medicare. Because adverse selection might then plague the private health insurance market, the authors argue in favour of risk-adjusted subsidies for those privately insured, with private insurance then charging identical premiums to all potential customers (as the heterogeneity that would give rise to differing insurance charges would be covered through subsidy) and mandated to provide minimal benefits packages to prevent cream-skimming based on factors observable to the insurer but not to the subsidiser.

Finally, Paolucci and Shmueli provide a method for determining an ex-ante prospective risk-adjusted subsidy that could be used to implement the model proposed by Paolucci, Butler and van de Ven. Currently, private insurers draw public subsidy through the claims-equalisation scheme; insurers are constrained by regulation not only to take on all potential applicants but also to charge a premium that does not reflect individual risk. Adjusting the subsidy for individual ex-ante risk characteristics rather than for ex-post claims experience may have desirable efficiency characteristics.

Left to be explored is the possibility that the health system as a whole diminishes private incentives to engage in health-promoting behaviours. As the financial costs of risky behaviour and of unhealthy lifestyles are externalised to those providing the subsidy, the National Preventative Health Taskforce might find it reasonable to mandate participation in morning exercise, regardless of whether the bulk of the effect is pecuniary.[4] (Touch your toes, Winston Smith!)

4 See Browning, E.K. 1999, 'The Myth of Fiscal Externalities', *Public Finance Review*.

But assuming the mandate is a system that ensures broad access to private health insurance, then — rather than mandating community-rated insurance premiums and compensating insurers for losses — providing instead lump-sum transfers to individuals conditioned on the exogenous elements of their risk characteristics while allowing private insurers to charge rates consistent with individual risk, could maintain the desired broad accessibility and, at the same time, preserve private incentives to make optimal choices among competing elements of a utility function broad enough to incorporate both health and other goals.

Health economists, duck-billed and otherwise, will find plenty to wrestle with in this Special Issue.

# Prevention No Cure: A Critique of the Report of Australia's National Preventative Health Taskforce

Mark Harrison and Alex Robson[1]

## Abstract

*Australia's National Preventative Health Taskforce baulks at the economic approach to public policy that weighs up costs and benefits, and instead adopts a 'healthist' perspective, with an open-ended and unconditional commitment to maximising health and a jumbling of private and external costs. The result is to overstate the benefits, and ignore the costs, of proposed policies. While this is predictable given the interests and agenda of preventative health advocates, it is not desirable. Not only is the economic approach mandated for regulatory reform, it has a number of advantages in determining the likely effects of policies and identifying unintended consequences. Although the Taskforce emphasises the irrationality of consumers, it is not clear whether a preventative health bureaucracy will improve the efficiency of health spending.*

## Introduction

In their 2009 report *Australia: The Healthiest Country by 2020*, the National Preventative Health Taskforce ('The Taskforce') made a number of policy recommendations regarding obesity, alcohol consumption and tobacco control. It recommended that a minimum price of alcohol be regulated; that there be widespread use of the tax system to discourage sedentary behaviour; that the price of tobacco should rise; and that tobacco manufacturing and packaging be further regulated. Given the sheer number of recommendations proposed by the Taskforce and their wide-ranging scope, it is important to investigate whether the Report constitutes a thorough and complete analysis, whether it is based on a rigorous assessment of the evidence on the issues it canvasses. This paper assesses how well the Taskforce Report meets these requirements.

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# The Taskforce Report's methodology

## The economic approach versus the 'healthist' approach to primary prevention

The approach taken in the Taskforce report and that of the authors of the papers they commissioned and studies they cite have a number of common features. They all adopt a *public health* approach, which economist Eric Crampton (among others) has labelled a 'healthist' norm.[2]

While economists try to account for all costs and benefits, the healthist norm measures only the health benefits of a policy. For example, the Taskforce proclaims its commitment to Australia 'becoming the healthiest country'. Nobody would disagree with the proposition that, all else being equal, better health outcomes are preferable to worse health outcomes. However, resources are scarce and individuals (and society as a whole) have other goals. The economic approach recognises that there are trade-offs between health and these other goals. Resources spent on health have an opportunity cost. Devoting more resources to prevention means that those resources cannot be devoted to other economic activities. To the Taskforce, opportunity cost is reduced to the missed benefits of possible activities that have not received government funding! 'The fourth rationale for selecting components of the Strategy is that of minimising opportunity cost — that is, the opportunities and benefits missed because of activities that have not been funded.'[3]

An open-ended commitment to promoting health eschews the very concept of trade-offs, and provides no limit to the budget and powers of the agency responsible for health policy.

Despite proposing a major expansion of regulation and major tax changes — indeed, a fundamental shift in government influence over individual decisions and market processes and outcomes — the costs and benefits of its proposed policies are not, as a rule, assessed in the Report.

In the health economics and insurance literature (and in the Taskforce Report), preventative activity which alters the probability distribution of losses is known as 'primary prevention'. It is the use of costly effort to reduce (but, in most cases, not completely eliminate) the probability of a loss occurring. Loss prevention is also known as 'self-protection' in the economics literature, and has been analysed at length by economists.[4] One of the key issues in this literature

2 See Crampton (2009a).
3 Taskforce Report: 34.
4 The seminal paper in this literature is Becker and Ehrlich (1972).

is whether, and under what circumstances, an individual or group that faces a risk (or a set of risks) can and should take costly action(s) to alter the nature of those risks (by affecting the probability distribution of the risks that are faced), and thereby seek to improve their wellbeing (usually measured in terms of ex-ante expected utility). Another key issue is how optimal preventative effort is affected by other activities that can influence an individual's (or group's) ex-ante expected utility, such as market insurance and self-insurance.

A key conclusion of this literature is that preventative effort should be undertaken until the marginal benefit (the reduction in expected losses) of the last unit of effort is equal to its marginal cost, where 'cost' refers to the opportunity cost — the value of resources in their best alternative use.

In theory, individuals may choose an inefficiently low level of primary prevention for a variety of reasons. For example, in an insurance setting where the actions of the insured cannot be perfectly observed by the insurer, the insured may have an incentive not to expend costly effort on reducing the probability of high future health costs, because they know these costs will be covered under their existing insurance arrangements. If the insurer cannot monitor preventative effort, increased preventative effort will not be reflected in lower premiums, and so the insured will have little incentive to invest in prevention. To take another example, if an individual in an imperfect information setting has chosen to consume a product that has certain health risks and underestimates the probability of those risks, then at any given price the consumer will tend to consume an inefficiently high amount of the good. Finally, another example of inefficiently low prevention arises when prevention taken by one individual confers unpriced spill-over benefits on others (for example, immunisation), or when consumption of a good imposes unpriced external costs on other consumers.

But prevention might also be inefficiently *high*, especially where decision makers do not take into account the costs of the preventative effort. An obvious instance is when the person undertaking the prevention reaps the benefits but does not pay the costs. In some instances, this is simply because the costs are not fully priced: for example, when my purchase of a stronger bumper bar protects my vehicle, but at the expense of greater harm to the vehicles of others. Equally, if there are government subsidies that favour prevention over other health-related goods and services (or if prevention is taxed relatively favourably compared to other health-related goods and services), then too much prevention may be provided and consumed. For example, if consumers have imperfect information and overestimate the probability of health risks of a certain product, then an inefficiently low amount of that good might be consumed.

As the Taskforce focuses on the effects of policies on the health system, it ignores many of the costs of its policies. In particular, it does not recognise the very different policy relevance of private and external costs.

## The Taskforce jumbles private and external costs

The total cost of anything may be divided into 'private costs' and 'external costs'. Supposing a consumer makes a decision that results in costs, then the costs borne by the consumer are private costs. The costs imposed on others are external costs.

The key point is that the consumer does not take account of the costs imposed on others in his decision making. As a result, external costs may be incurred (without any compensating benefit): external costs are excessively high and there may be a role for government to reduce them.

In contrast, the consumer does take account of private costs, and will incur them only when they are worth incurring; that is, when the private costs of an individual's choices are smaller than the private benefits of those choices. The Taskforce ignores these benefits, yet they mean private losses, to the extent that they are borne by rational, well-informed consumers, are not policy relevant and so there is no economic reason for policy to address those particular costs.

Consider, for example, the case of skiing — a risky activity that has both costs and benefits.[5] For the purposes of our discussion there are two kinds of costly risks involved. If a skier has an accident and imposes costs on nobody other than himself and had an understanding of the likely level of those costs, then those costs, however significant, are purely private. The presumption of consumer rationality dictates that the skier's expected private benefits from skiing outweighed the expected private accident costs. On the other hand, skiers may also be involved in accidents with other skiers, who may also suffer damage. In this case, there are external losses to consider, and these are policy relevant. But the source and economic nature of the two costs are very different; it makes no economic sense to lump both kinds of costs together and develop policies which attempt to reduce or completely eliminate both.

In the economic approach, only external costs are relevant for the assessment of primary prevention-policy interventions by government. If the consumer does not take account of some private costs because of irrationality or imperfect information about the health risks of a product, then they may be akin to external costs. But the appropriate government intervention depends on the

5 This example is used by Crampton (2009b).

particular irrationality or information bias. In general, a lack of information gives rise to a case for providing more information. If people underestimate private costs, only the underestimate should be the focus of policy.

The Taskforce, and the consultants it relies on, emphasise gross health costs, the aggregation of both external and private costs. For many non-economists the policy goal then becomes (either implicitly or explicitly) to significantly reduce or completely eliminate all of these losses, no matter what the cost. 'Focusing on minimising gross health alone suggests extreme, prohibitive policies.'[6]

Ignoring the difference between external and internal benefits and costs also runs the risk of creating a misleading impression for members of the public who are concerned about the costs that might be imposed on them by smokers. When the Taskforce Report states that 'the overall cost of smoking to the economy is more than $30 billion each year' (Collins and Lapsley 2008), it gives non-smokers the impression that smokers are imposing these costs on non-smokers whereas most of the economic literature finds that the bulk of the estimated costs are actually borne by the smokers themselves. Attributing internal costs that are actually borne by smokers themselves as part of the 'cost of smoking to the economy' incorrectly attributes those costs.

The fundamental problem with the non-economic approach is that it can lead to policies which needlessly make members of the community worse off. The net economic benefits of proposed policy changes which aim to avoid all losses — even if those policies effectively achieve this goal — will be grossly overstated, because the forgone private benefits of the behaviour at issue are being ignored. This means that even when cost-benefit analyses of policy changes are conducted, such analyses will likely overstate the net benefits of policy, and will likely lead to socially wasteful policy choices.

The net benefits of policy changes will only ever be a fraction of the total health costs that are attributed to obesity, alcohol consumption and tobacco use. The fact that 'prevention works' and reduces observed costs does not automatically mean that implementing the policy will raise the community's overall wellbeing.

It is important to appreciate that the economic assumption of rationality does not require 'full information'. For example, it is not necessary that a smoker have a full understanding of all of the health ramifications of smoking. All that is required is an understanding of the likely level of future health costs.

If some consumers do not have an understanding of the likely level of future health costs, then there is, in principle, a case for corrective taxes. However, this case needs to be made out rigorously and to be carefully justified using

6 Clarke (2008): 29.

a detailed assessment of costs and benefits. To make out a convincing case for higher taxation, it is not enough to simply assert that consumers operate in a world of incomplete, imperfect information. Such an assertion is vacuously true, but it does not tell us what the correct level of taxation is, and how that compares with current tax rates.

Even if some consumers do not understand the likely level of future health costs, such taxes may worsen the community's wellbeing for two reasons:

- First, it may not be the case that all consumers misunderstand the likely level of future health costs. Taxation affects the price that all consumers pay, whether they understand those costs or not. An increase in taxes may induce 'uninformed' consumers to make the 'right' decision by signalling to them the true future health costs. But higher taxation will induce 'informed' consumers to consume less than their individually optimal amount. This is no less true for goods like cigarettes, for which there is no safe level of consumption.
- Second, it may not necessarily be the case that consumers always underestimate the future health costs of their choices; they may just as easily overestimate the likely level of future health costs. In fact, behavioural economics emphasises the bias towards overestimating the probability of rare events.

There is good evidence that, as a general rule, smokers tend to overestimate the adverse health effects of smoking. Viscusi (1992) conducted a large scale US national survey of lung-cancer risk perceptions, in which participants were asked to indicate the number out of 100 smokers who would develop lung cancer. He reports (p. 7) that:

> The main finding with respect to risk perceptions for lung cancer is that not only is there substantial awareness of smoking hazards, but overall individuals appear to overestimate the risks compared with the levels in the scientific evidence. Whereas the best scientific estimates of the lifetime lung cancer risks from smoking range from 0.05 to 0.1, individual perceptions of the risk are much greater. The entire population assesses this risk at 0.43, and even current smokers have a substantial risk perception of 0.37. The fraction underestimating the risk is less than 10 per cent, and the extent of their risk underestimation is comparatively small in magnitude.

That is, imperfect information or a misunderstanding of future health costs may actually lead to less smoking than if risks were accurately perceived. An increase in taxes would increase rather than reduce the costs of misperceptions. Further, if people overestimate future health costs, then campaigns alerting them to these risks will have little effect.

Further, the justification for the rationality assumption is not that people always know what is best for themselves, but that they are more certain to seek their own interests than are others. In particular, bureaucracies have their own interests and incentives, not necessarily promoting efficient levels of preventative expenditure. Political motives, empire building and other objectives will play a role.

The relevant question is whether individuals will better promote their own interests if they make decisions compared with government officials making decisions for them through the political process. Economic policies should be assessed in terms of the incentives they create and the consequences that follow, rather than simply the goals they proclaim.

Self-interested bureaucrats receive pecuniary and non-pecuniary gains from controlling larger programs and by increasing the size of their own bureaucracies (for example, increases in power, prestige, promotion prospects and salary). They may even believe it is in the public interest to expand the activities of their organisation. They push for larger-than-optimal levels of bureaucracy (empire building) and increase their own rewards. They have an incentive to increase program size, even if the incremental benefits to program recipients are less than the costs. They have an incentive to exaggerate the demand for, and understate the costs of, extra programs.

## Overstatement of benefits

Smoking may depend on unobserved individual characteristics — such as the degree of risk aversion or the individual's discount factor — that also influence health through other channels. Smokers or heavy drinkers are likely to differ from those that do not engage in this behaviour. For example, smokers tend to be greater risk takers, working in riskier jobs and/or require a lower payment to bear that risk. Smokers are less likely to perform preventative health activities such as wearing seatbelts, flossing their teeth, and checking their blood pressure. Smokers are more likely to be injured at work (controlling for objective measures of risk) and at home. They are also more likely to be heavy drinkers. The greater risk taking of smokers reflects a broader pattern of behaviour and is not limited to smoking decisions.[7]

As a result, public policies that decrease smoking prevalence may not achieve large gains in life expectancy or large economies in health expenditure. Smokers who quit or reduce their consumption of cigarettes would certainly face a lower

7 See Hersch and Viscusi (1990) and (1998).

risk of tobacco-related diseases, such as lung cancer, but would not necessarily see their life expectancy increase by large margins. Estimates of the effect of tobacco on health costs that do not account for this would tend to be biased.

The healthist norm also makes no allowance for offsetting increases in health costs resulting from their policies. For example, the average quitter puts on weight, aggravating potential obesity problems and any associated health costs. Policies that save lives are good things, but they do not necessarily reduce medical costs, as they can increase the demand for spending on other conditions. Non-smokers incur some health-care costs that smokers do not. Studies that compare health costs for smokers and non-smokers are consequently ambiguous — many find that lifetime health costs are greater for non-smokers.[8]

Extending life is a benefit, but there is no need to exaggerate the benefits by claiming that it must *always* result in lower health costs. Saving lives is not the same as reducing health costs. For example, the success of a major life-saving intervention, such as a by-pass operation, extends life but, precisely because the patients have greater chances of survival, the intervention may result in another major intervention in the future. Savings lives is, of course, desirable and both life-saving interventions can be worth the cost and result in net benefits — but health costs rise rather than fall.

When cost benefit analysis is done in the report, what are evaluated are the benefits of *reaching a target*, not the costs and benefits of the Taskforce report's proposed polices. That is, it is *presumed* that the policies will cause the targets to be met, rather than assessing the likely effects of the policies. The target may be desirable, but the relevant policy issue is whether the policies proposed in the Taskforce report will achieve them, and at what cost.

The costs and benefits of a policy require a counterfactual scenario — what would happen without the policy? — to provide a base case from which the incremental costs and benefits of a policy can be determined. For example, the Taskforce does recognise that smoking rates have been declining, but nowhere does it systematically discuss the implications of what would happen to the rate if policies were to remain unchanged. Thus, it is impossible to work out the contribution of the Taskforce's policies to meeting its reduced smoking targets.

The number of people who have died in the past and the current costs of smoking are the consequence of past smoking rates, not current smoking rates. Computing future costs on the basis of current costs — which are themselves based on past rates of smoking, not current or expected future smoking rates — makes no economic sense. Similarly, designing the path of future corrective taxes based on past and current behaviour has little economic justification.

8 See, for example, Barendregt *et al*. (1997).

The Taskforce Report argues that taxes on tobacco will improve equity because those who quit will no longer experience smoking-related health problems. But this claim ignores the costs of quitting and the fact that tobacco demand is price inelastic. It only applies to marginal consumers — those who change behaviour as a result of the policy change. It ignores *inframarginal* consumers: since tobacco is price inelastic, a large number of low-income individuals will continue to smoke even after the proposed tax increase. In the absence of compensation, these individuals will be made unambiguously worse off as a result of the proposed tax increase. And since the studies that the Taskforce cites to support its case tend to overestimate the reduction in demand from the Report's proposed policies, they also tend to underestimate the number of inframarginal consumers. This means that the equity effects of the Taskforce Report's policies are likely to be much greater than the Report anticipates.

For all these reasons, the public health approach overstates the benefits from interventions.

## Underestimation of costs

Neither does the Taskforce — nor its consultants — account for health costs of discouraging moderate drinking or encouraging substitution into drugs. As a pioneering study into the effects of tobacco, alcohol and drugs on mortality and morbidity in Australia observed:

> In addition to the harmful effects, however, when consumed at moderate levels alcohol appears to be associated with a decrease in heart disease and stroke. The number of people in Australia who drink at moderate levels far outweighs the number who drink at hazardous or harmful levels, so this apparent protective effect is greater for the overall population than the harmful effect for deaths, though not for potential years of life lost.[9]

The Taskforce Report does not explain how policies such as having higher taxes would reduce problem drinking without reducing beneficial, moderate drinking. Indeed, the best evidence shows heavy drinkers and light drinkers respond less to price increases than do moderate drinkers.[10] Higher taxes are likely to have the greatest effect on the moderate drinkers. As a result, even from a narrow, 'healthist', point of view, they are likely to do more harm than good.

9 See Ridolfo and Stevenson (2001): xiii

10 See, for example, Manning, Blumbergb and Moulton (1995).

# Advantages of the Economic Approach

Without a conceptual framework to understand why people smoke, overeat and drink excessively, it is difficult to analyse and assess the effect of policies to reduce these behaviours.

## Understanding individual behaviour and decision making

There are important reasons why policymakers should distinguish carefully between private and external costs and why reductions in the latter should be the most appropriate goal for policy. One of the main reasons is that policymakers are heavily information constrained and are far less able to assess private costs and benefits on an individual, case-by-case basis than the individuals who actually bear those costs and benefits. In such a heavily information-constrained environment, policies which seek to override the principle of consumer sovereignty, no matter how well-intentioned they may be, run a significant risk of reducing the community's wellbeing.

Furthermore, it is private costs and benefits that motivate individuals to behave in the way they do, and which induce them to make the choices that are observed in the data. By failing to distinguish between private and external costs in the policymaking process, there is a risk that policymakers will fail to understand how both private and external costs are generated and why individuals behave the way they do and make the choices that we observe. A failure to understand and appreciate the reasons behind individual behaviour means that future choices cannot be confidently predicted, which in turn means that the likely behavioural response of individuals to policy changes (such as taxes, price regulation and quantity regulation) will be difficult to forecast, let alone measure in any meaningful way.

For example, if all consumer choices are assumed to be 'irrational', then how can the likely implications of policy decisions for the community's wellbeing be ascertained? Individuals compare the private benefits of a particular choice with private costs. Policy changes usually seek to alter that benefit-cost calculus in order to change the consumer's choice and better align their private incentives with social costs and benefits. But the resulting choices that are made after policy interventions occur are still the result of a (policy-modified) private benefit-cost calculation. Ignoring the fact that there are private benefits of certain choices and that there are costs incurred by individuals when they change their behaviour, or pretending that the private benefits of certain consumption choices do not exist is not realistic and simply makes policy analysis less rigorous.

## An example: The rational-addiction model

Many forms of consumption are habit-forming, and some are addictive, including smoking, jogging, attending church, using heroin and eating corn flakes. That does not imply that the behaviour of addicts is unpredictable. Indeed, the Taskforce Report presumes that smokers respond in predictable ways to increases in prices and information about the health costs of smoking.

The theory of rational addiction (Becker and Murphy 1988) applies the standard economic approach — individuals have simple objectives and tend to choose the best way to achieve them — to addiction. The rationality assumption is that people choose the correct way. It does not imply that people use formal rational analysis.

Rational behaviour is the predictable element in human behaviour. To assume irrationality is to abandon attempts to explain or predict behaviour and makes it difficult to determine the effects of policies to change behaviour. The purpose of rational-addiction theory is not to assert that all addicts are rational or to assert the ascendency of economics, but to better predict behaviour and the effects of various changes. It is useful if it produces sharper and richer predictions that are empirically correct and insights into addictive behaviour.

In the rational-addiction model, rational consumers maximise utility from stable preferences as they try to anticipate the future consequences of their choices. For the addictive good, an increase in current consumption increases future consumption of the good, and so current utility depends on past consumption.

For example, the theory of rational addiction predicts that addicts will respond to price changes, and addicts may pay more attention to price than light users. Indeed, rational addicts should respond to anticipated future price increases before they even occur. A number of empirical studies have found that to be the case. For example, Becker *et al*. (1994) found that cigarette consumption falls when a price increase is expected, but before it actually rises.

In the theory, habitual behaviour displays a positive relation between past and current consumption. A strong habit may become an addiction. A necessary condition for a good to be habit-forming, and potentially addictive, is that past consumption of the good raises the marginal utility of current consumption. Addiction may be beneficial (for example, jogging) or harmful (for example, heroin).[11]

The theory of rational addiction, which is not referred to in the Taskforce Report, explains many well-known features of addictions, such as bingeing,

11 For an excellent summary of rational addiction theory, see Becker (1992), which these paragraphs draw on.

bifurcated demand (for strongly addictive goods, people either consume a lot or abstain) and why strong addictions must terminate abruptly (going 'cold turkey'). These behaviours are consistent with people trying to anticipate the future consequences of their choices; there is no need to abandon the economic approach or to assume irrationality to explain them.

The theory can also predict the characteristics of people likely to become addicted. A good may be addictive to some people, but not others. For example, because the consumer is forward looking, the 'full price' of a harmful good includes the money value of the future adverse effects on utility or earnings. The adverse effects depend on the total amount of past consumption. This cost will be lower to less future-oriented people (present-oriented or the impatient — those with high discount rates, to use economic jargon). The present-oriented are more likely to become addicted to harmful goods, because an increase in consumption leads to a smaller rise in the full-price when the future is more heavily discounted.[12]

When the health costs of smoking became known from the mid-1960s, the full price of smoking increased. Smoking rates went down dramatically, even amongst supposedly present-oriented teenagers, indicating that smokers do respond to information about future consequences. Those who smoke after the new information became available may be more myopic than quitters and people who do not begin to smoke. This explains the stronger negative relation between education and smoking in the 1970s and 1980s than before the health consequences became widely known (more future-oriented people are more likely to become educated, which involves delayed benefits).[13] Further, ongoing economic growth increases earnings and raises the value of future adverse effects. We would expect a downward trend in smoking prevalence from this increase in the full price, even with a constant money price.

Unfortunately, the rational-addiction model is widely misunderstood. For example, the Cancer Council's comprehensive review of tobacco in Australia criticises the model because: 'The model would predict that individuals rarely regret past decisions about consumption, a theory not borne out in interviews with current smokers, almost all of whom regret ever having started smoking.'[14]

However, individuals are uncertain as to whether they will become addicted; nothing in the theory presumes that people know for sure whether they will become addicted. Things may not turn out well, and an individual may regret smoking so much when young, and may try to fight his addiction. On the other

12 See Becker and Murphy (1988): 682.
13 Ibid: 687.
14 Scollo and Winstanley (2008): chapter 13, 10–11.

hand, continuing to smoke may be rational in the face of the costs of giving up. That some decisions about actions with uncertain consequences turn out badly does not mean the initial decision was irrational.

As Becker and Murphy state in the original paper on rational addiction, their approach does not imply addicts are happy: 'Although our model does assume that addicts are rational and maximize utility, they would not be happy if their addiction results from anxiety-raising events, such as death and divorce, which lower their utility. Therefore, our model recognizes that people become addicted precisely because they are unhappy.'[15]

Harmful addictions are often traceable to anxiety, tension and insecurity produced by stressful events (divorce, unemployment, death of a loved one). Temporary events can cause rational people to become addicted.

Indeed, for a harmful good, the model predicts that greater past consumption can lower present utility because of adverse health effects. Further, given levels of consumption of the harmful good may be less satisfying when past consumption has been greater (the user develops a tolerance). That is, higher past consumption lowers the present utility from the same consumption level, but raises the *marginal* utility of consuming the addictive good (reinforcement).[16]

## Policy implications of the rational-addiction model

The rational-addiction approach has a number of implications for policies to reduce smoking and other addictive behaviour. As current heavy smokers are likely to be present-oriented, campaigns that emphasise the future health costs of smoking are likely to have little effect. Raising taxes is likely to be more effective for these individuals, as the money price of cigarettes is a larger component of the full price for present-oriented people.

The opposite would be true for light users, who would tend to be more future-oriented than heavy users (but less so than abstainers). On the other hand, the health costs of smoking are widely known, and smokers are likely to have taken them into account already.

If the health benefits come from quitting altogether, rather than from simply cutting back, then it is precisely the addicts (who are more likely to quit altogether) at whom the policy should be aimed. Becker, Murphy and Grossman (1991) found that lower income and younger people respond more to price changes. Others respond more to future harmful effects.

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15 Becker and Murphy (1988): 691.

16 See Becker and Murphy (1988): 681–82; Becker, Grossman and Murphy (1991): 237; and Becker (1992): 120.

Furthermore, the rational-addiction model highlights that the policies recommended in the Taskforce Report to reduce smoking, excessive drinking and weight gain may have costs that are not considered in the Report. 'Kicking' a habit has benefits, but it also involves real psychological, health and economic costs. People continue to smoke, drink and eat fatty foods, even when addicted, because giving up would make them less happy, just as it is rational for others to give up and bear the short-term loss in utility for a larger long-term gain. With uncertainty on the best approach to minimise the costs of quitting for a particular individual, and substantial short-run loss in utility from stopping, an addict may have several failed attempts at quitting.

Failing to consider and understand private motives for consumption choices and the costs of changing behaviour also increases the risk that policymakers will devise and implement policies that are either ineffective from an overall welfare perspective or which create unintended negative consequences.

## The economics of unintended consequences: Cross price elasticities and external costs and benefits in related markets

The economic approach sheds light on the simple approach to corrective taxation: for a good whose consumption generates external costs, the tax should be set equal to those marginal external effects, where the marginal external effects are measured at the efficient consumption point. However, if the tax causes consumers to substitute towards other goods whose consumption also generates external costs (or external benefits) and which are not taxed appropriately, then the simple Pigouvian rule may have to be modified.

A tax increase induces consumers to switch into some other activities (substitutes) and away from others (complements). The switch out of the taxed activity may reduce health costs, but the switch into other activities (and away from complements) may increase health costs. In other words, taxes may have unintended consequences.

A good example is alcohol taxation. Some forms of alcohol are substitutes with each other; but some are complements. If the cross price elasticity of demand is negative (positive), then a price rise on a good in one market induces a fall (rise) in consumption in another market, and the goods are complements (substitutes).

Evidence from the UK and elsewhere suggests that beer and wine are complements, whereas spirits and wine are substitutes. Raising taxes on one form (for example, ready-to-drink mixes or RTDs) induces substitution into other kinds of alcohol, or simply into other forms of consuming the same drink

(consumers may simply make their own 'alcopops'). The tax induces a reduction in demand of the good whose price rises, but does not address the underlying health problem because of the existence of close substitutes with a lower price. Unless the price of each good, as perceived by the consumer, fully incorporates its health consequences, the result of that substitution may be a deterioration in health.

More formally, in the Pigouvian framework, the substitutes and complements of taxed activities may themselves have social external costs or benefits. If prices in those markets do not reflect social marginal costs and benefits, then changes in activity that occur in these other markets will have welfare consequences that are not reflected in the market for the good that is being taxed.

There is a large body of evidence on health prevention, substitution effects and unintended consequences. For example:

- There is evidence (for example, Dinardo and Lemieux 1992) that raising the minimum drinking age in some US States reduced alcohol prevalence but increased the prevalence of marijuana consumption.
- There is evidence that smoking cessation leads to weight gain (Flegal *et al*. 1995), particularly among low-income consumers (Filozof 2004).
- To the extent to which increased taxes and plain packaging encourage substitution into illegally supplied tobacco (chop-chop), costs (including forgone revenue) are borne with no offsetting health benefit (if anything, health costs may increase). The existence of illicit supplies is a serious constraint.
- To the extent that higher tobacco taxation is associated with higher smuggling, inappropriate policies aimed at reducing smoking prevalence may themselves lead to increases in smuggling and other crime rates, with a very low reduction in actual smoking prevalence.
- Drug prohibition is an example of a policy which has had costly unintended consequences. There is a significant body of economic evidence which shows that prohibition promotes violent crime. Miron (2001) shows that there is a positive relationship between the enforcement of prohibition and homicide. Goldstein *et al*. (1989, 1997) find that a large proportion (almost three-quarters) of drug-related murders were due to conflict or disputes over drug territory, drug debts and other drug-related trade issues, rather than the psychopharmacological effects of drugs.
- In a recently published theoretical study, Yaniv *et al*. (2009) show that a 'fat tax' reduces obesity among individuals who are not weight conscious, but for weight-conscious individuals a 'fat tax' could increase obesity by reducing both the consumption of junk food *and* the amount of time devoted to exercise and physical activity if the substitution away from fast foods

towards home-cooked meals brought about by the fat tax means that the individual no longer has time to exercise.

## Best-practice regulation, cost-benefit analysis, and regulatory impact statements

In Australia, the economic approach to policymaking is deemed so useful that it is mandated in an attempt to limit excessive and inefficient regulation. New regulatory proposals are subject to a Best Practice Regulatory Framework. This framework's requirements can be found in the *Best Practice Regulation Handbook*. The framework 'requires a structured approach to policy development that systematically evaluates costs and benefits', which includes:

> Consideration of a range of options for achieving the objective (as well as a 'no action' or status quo option) and an analysis of the likely economic, social and environmental consequences The policy development process should at least ensure that the benefits to the community of any regulation actually outweigh the costs, and give some assurance that the option chosen will yield the greatest net benefits.[17]

Significant proposals should be subject to formal cost-benefit analysis and the principles of good regulatory process require that: 'Only the option that generates the greatest net benefit for the community, taking into account all the impacts, should be adopted.'[18]

Compliance with the procedures and processes outlined in the *Best Practice Regulation Handbook* remains mandatory for all Australian Government departments, agencies, statutory authorities and boards that make, review or reform regulations.

The Taskforce Report falls far short of these rigorous standards. For example, the compliance costs or the effect on market competition of the proposals are not assessed or analysed. Indeed, the Report (p.242) recommends exempting liquor-control legislation from 'the constraints of National Competition Policy', and adopts the approach that the more cigarette companies object to a proposal, the better it is: 'Shareholder nervousness and industry opposition to restrictions on pack design are a strong indication of the importance of packaging to tobacco sales' (p.181).

But the question that needs to be answered for sound policy analysis and advice is how to achieve policy objectives in the least costly way, not to inflict as much cost on individual businesses and industries as possible.

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17 Australian Government (2007): 1–2.

18 Australian Government (2007): 2.

# Conclusion

In summary, the approach taken by the Taskforce can be encapsulated in the following five points:

1. Certain activities create health costs — and, therefore, are judged to be automatically undesirable.
2. It automatically follows that there is a role for government to do something to discourage individuals from undertaking those activities.
3. The Taskforce then sets arbitrary targets for reductions in these particular activities.
4. The Taskforce then develops recommendations for policymakers to achieve those targets, without examining the social costs and benefits of those policies.
5. Finally, the Taskforce asserts, without evidence, that the policies that have been recommended will achieve these arbitrarily chosen targets.

The National Preventative Health Taskforce Report has bypassed the hard work that is needed to the make the credible cost-benefit calculations required for rigorous public policy analysis. Establishing that smoking, excessive eating and excessive drinking lead to poor health outcomes does not establish that the Taskforce Report's policy recommendations aimed at reducing these things will be beneficial, effective, or even work in the desired fashion. Policymakers need to know the costs involved, how smoking, eating and drinking will be affected and the health benefits that would flow from each change.

The Preventative Health Taskforce Report has set some arbitrary targets for reductions in the number of people who smoke, drink excessively and are overweight and has suggested policies to achieve these targets. However, although the Taskforce Report cites many papers and presents hosts of statistics and data, there is no systematic assessment of the costs and benefits of the recommended polices.

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# The Analytics of the Australian Private Health Insurance Rebate and the Medicare Levy Surcharge

Alex Robson, Henry Ergas and Francesco Paolucci[1]

## Abstract

*This paper presents an analytical framework for examining changes in the Private Health Insurance rebate (PHIR) and the Medicare Levy Surcharge (MLS), and uses it to establish three key propositions. First, increases in the MLS rate tend to reduce the elasticity of demand for private health insurance. Second, simultaneously increasing MLS rates and thresholds has a theoretically ambiguous effect on PHI take-up rates. Third, means testing the PHIR can never increase PHI take-up, and will reduce it in some circumstances. The paper concludes with a discussion of the possible consequences of recently proposed policy changes to private health insurance in Australia.*

## Introduction

The Australian public-private mix in healthcare financing and the regulatory framework in the private health insurance market shape private health insurance market outcomes and performance in the following ways. First, the public insurance program (i.e. Medicare) provides a floor under the entire health system in Australia, with changes in quality and waiting times in the public system continuing to influence demand for private health insurance (PHI). Second, the 'community rating' and 'open enrolment' regulations for private health insurance mean that providers are heavily restricted in the extent to which they can charge different prices for consumers with different risk classes, though some (potentially significant) risk selection occurs through the design of insurance products. Third, increases in PHI premiums are regulated, with annual increases above the CPI requiring approval by the Health Minister each year.

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The impact of the Medicare system and other regulatory features (in particular, the community-rating regulations) on PHI demand can be seen in the steady decline in PHI membership numbers following the scheme's (re)introduction by the Hawke government in 1984. In the absence of other policy interventions — in particular, the lifetime health cover, the premium rebate and the Medicare Levy Surcharge introduced in the period between 1997 and 2008 — it is likely that PHI members would have continued to decline.[2]

Over the past years, it has been argued that the private health insurance rebate is poorly targeted, and that the rebate disproportionately affects inframarginal consumers: those individuals and families who would take out private health insurance in any event, even in the absence of any rebate. In addition, policymakers have modified the premium rebate arrangements by introducing age-related adjustments. For example, in 2009 the Government proposed that for individuals on incomes between $75,000 and $90,000, the rebate would be 20 per cent for those aged less than 65 years old, increasing to 25 per cent for individuals between 65 and 70, and 30 per cent for individuals aged 70 years or older. A second emerging policy trend is the increase and indexation of the income thresholds for the Medicare Levy Surcharge (MLS) and the recently proposed changes in MLS rates. These two policy trends have been partly motivated by emerging fiscal constraints, but the way in which they interact and their broader consequences for future fiscal and health outcomes have not yet been completely explored or understood.

This paper presents an analytical framework for examining changes in the Private Health Insurance rebate and the Medicare Levy Surcharge, and uses it to establish several key propositions, including that means testing the PHIR can never increase PHI take-up, and will reduce it in some circumstances.

# The current regulatory and policy environment

## The PHI Rebate and the Medicare Levy Surcharge

The Private Health Insurance Incentives (PHII) Act 1998 introduced the 30 per cent private health insurance rebate. This rebate replaced the previous PHIIS

2 For a detailed overview and discussion of the regulatory framework in place in the PHI market in Australia, we refer to Paolucci *et al*., paper under review in this special issue.

Butler (2002), Frech *et al*. (2003), and Palangkaraya and Yong (2005) suggest that the sharp jump in PHI-enrolees, from about 30 per cent to 45 per cent of the Australian population occurred in July 2000, is attributable to the lifetime health cover policy, rather than the introduction of the PHI rebate and the Medicare Levy Surcharge.

subsidy for low-income earners. From April 2005, the rebate for persons aged 65–69 years increased to 35 per cent and for persons aged 70 years and over it increased to 40 per cent.

The Medicare Levy Surcharge (MLS) of 1 per cent of income was introduced on 1 July 1997 and until recently applied to single individuals with taxable incomes in excess of $50,000 and couples and families with combined taxable incomes in excess of $100,000 who do not have 'sufficient' private hospital cover. This is defined as cover that is 'provided by an insurance policy issued by a registered health insurer for some or all hospital treatment provided in an Australian hospital or day hospital facility'. These nominal thresholds were not indexed to inflation or to changes in average weekly earnings. The effect of non-indexation has been to reduce the thresholds by around 36.5 per cent in real terms since 1997, which is the change in the average level of prices (i.e. the CPI inflation rate) over that period.[3]

## The current policy environment and recent changes to the PHI Rebate and the MLS

The Medicare Levy Surcharge is an additional tax on all taxable income, and is payable once taxable income reaches a certain threshold unless the individual purchases an adequate amount of private health insurance. It is important to realise that if the baseline against which we are assessing additional public expenditure is that all individuals would ordinarily pay the additional tax impost that is embodied in the MLS, then it may only be in an accounting sense that the MLS involves less 'public expenditure' than the PHI rebate.

In other words, to the extent that policy changes induce individuals not to pay the MLS, tax revenue is forgone as a result, and so the MLS can be regarded as a *tax expenditure* — all the more so as absent forcing people into PHI, the government could, as an alternative, simply charge them the MLS as a supplementary tax. Thus, assessed on an economic basis, it is not necessarily the case that replacing the rebate 'carrot' with the MLS 'stick' would tend to reduce public expenditure, broadly defined. Moreover, unless the MLS does not affect any individuals and is completely inframarginal (in which case, there is no need for it), the MLS is effectively a supplementary income tax (except that instead of paying the tax, the consumer buys PHI), with the same excess burden as a supplementary tax.

3 In addition to these policies, there are restrictions on the amount of excess that can accompany the insurance policy. PHI taken out after 24 May 2000 which has an 'annual front-end deductible' amount or excess of more than $500 in the case of a policy covering only one person, or more than $1 000 for all other policies, does not provide private patient hospital cover for MLS purposes.

## Recent changes to thresholds and rates

Prior to 2008 the PHI rebate consisted of a single rate for individuals aged less than 65, and the MLS consisted of a single rate. The Australian Government has made several significant policy changes and announcements which have altered previous arrangements for the PHI rebate and the MLS. From 1 July 2008, the total taxable income for surcharge purposes above which the MLS of 1 per cent is payable was increased for single individuals, from $50 000 to $70 000, with the combined taxable income for surcharge purposes for couples and families increasing from $100 000 to $140 000. This change restored the thresholds roughly to their original 1 July 1997 levels in real terms and eliminated the MLS 'stick'[4] for individuals and families whose income fell between the old and new thresholds.

The other significant policy change that occurred in 2008 was that the MLS thresholds will henceforth be indexed to changes in average weekly ordinary-time earnings (AWOTE). This change is not innocuous. Since AWOTE has tended to grow more rapidly than consumer price as real wages continue to grow, the MLS threshold will increase in real terms even if it is not adjusted by further legislative changes.

Predicting the overall effect that indexation will have on financial incentives to purchase PHI is complicated by two further considerations. First, real wage growth across different income levels is not uniform. Second, growth in real wages is not necessarily the same as growth in real taxable incomes, which is what an individual or family's possible MLS liability is based upon.

It is also important to note that even if current policy settings are left unchanged, growth in real premiums would alter the quantum of incremental financial incentives that individuals face for purchasing PHI. This occurs because the PHI rebate is an *ad valorem* or percentage subsidy, as opposed to a specific subsidy or a payment of a fixed dollar amount.

In its 2009 Budget the Government proposed additional changes to the MLS and the PHI rebate. These changes were part of the *Fairer Private Health Insurance Incentives* (FPHII) *Bill 2009*, which passed the House of Representatives but was ultimately defeated in the Senate on 9 September 2009.

The Government revived and reintroduced the proposed changes into the House of Representatives on 7 July 2011, in the form of the *Fairer Private Health Insurance Incentives* (FPHII) *Bill 2011* and related bills.[5] Instead of the

4 In the context of the MLS and the PHI rebate, this terminology is due to Palangkaraya and Yong (2005).

5 An earlier version of this paper discussed the FPHII 2009 proposed changes. One referee of this paper conjectured that 'The possibility [of means testing the PHI rebate] seems moot from a policy perspective, given that the proposal has been rejected by the Senate and it does not look likely that it will be revived.' This

MLS applying at a single rate for individuals and couples and families regardless of income, as of 1 January 2012 the FPHII Bill proposed that there be three new 'Private Health Insurance Incentive Tiers'. Existing arrangements would remain unchanged for singles with income of less than $80,000 per annum and families with incomes of less than $160,000 per annum. The three proposed new tiers are as follows:

- *Tier 1*: Applies to singles with income of more than $80,000 but less than $93 000 (more than $160 000 but less than $186 000 for families). The PHI rebate would be 20 per cent, increasing to 25 per cent at 65 years of age, and to 30 per cent at 70 years. The MLS would remain at 1 per cent.
- *Tier 2:* Applies to singles with income between $93 001 and $124 000 ($186 001 and $248 000 for families). The PHI rebate will be 10 per cent, increasing to 15 per cent at 65 years of age, and to 20 per cent at 70 years. The MLS will be increased to 1.25 per cent.
- *Tier 3*: Applies to singles with income of more than $124 000 (more than $248 000 for families). No PHI rebate will be provided, regardless of age. The MLS will be increased to 1.5 per cent.[6]

## Financial incentives and behavioural responses: The basic economics of the MLS and the PHI rebate

The previous section set out the current and proposed policies regarding the PHI rebate 'carrot' and the MLS 'stick'. To obtain a more complete picture of the effects of policy changes on PHI demand, we analyse incentives to purchase PHI, which depend on the individual's subjective valuation of the services provided by private health insurance.

In the discussion that follows, it is important to keep in mind that the demand for private health insurance in Australia is effectively a demand for insurance that is supplementary to the universal insurance that is provided by the Medicare system, rather than insurance for primary health care cover *per se*. In this setting the demand for PHI is driven by two factors:

1. A supplementary *care* component, affected by waiting times and the availability of treatments in private care that are rationed in public care. This

conjecture turned out to be premature and incorrect.

6 The proposed policy's major parameters are summarised on page 8 of the Explanatory Memorandum to the FPHII Bill.

is a function of the gap in care level between the public and private sectors and of each individual's perception of his or her health risk; and

2. A supplementary *amenity or service* component, which depends on features such as private rooms, which depends mainly on income.

In what follows, we treat the insurance provided by Medicare as essentially a constant that is subtracted from the individual's loss in the event of ill-health. Assuming that the level of each of these in the public system can be treated as exogenous (or at least predetermined), recognising the supplementary character of PHI does not alter the substance of the analysis. On the other hand, if PHI coverage affects the level of these variables in the public system, then the analysis would need to endogenise public care demand and supply and take account of the feedback effects of the private system to the public system.

## Factors influencing individual demand for private health insurance

In the economic literature the theory of the demand for insurance is a sub-field of the economic theory of choice under uncertainty. Typically (but not always) the expected utility hypothesis is used to study individual insurance choice behaviour under various conditions. In this framework, individuals (or families) face an uncertain set of possible future health risks, to which the individual assigns probabilities. Individuals have preferences over wealth levels or income and choose insurance, taking the price of coverage as given.

Purchasing health insurance changes the calculus of the risks that an individual faces. Insurance reduces the amount of income that the individual can use to purchase other goods and services, but also reduces the welfare loss that the individual faces in the event of ill-health. An individual's willingness to pay (WTP) for insurance depends on five broad sets of factors, each of which will enter the analysis that follows:

- Income
- Price
- Tastes
- Risk factors
- Characteristics of the insurance package offered.

The first two factors are self-explanatory, but the last three deserve further discussion. By tastes, we are referring primarily to an individual's attitudes towards risk. A *zeromean* risk is a risk which has positive variance but an expected value of zero. An individual is said to be *risk averse* if, starting from some initial income, they would prefer not to face a zero mean risk.

By risk factors here we refer to the individual's subjective probability assessment of the health risks that they believe they will face, as well as the nature and size of those health risks. These in turn can depend on an individual's age, sex, ethnicity, and other characteristics. The characteristics of the insurance package here refer to the type of coverage that is offered, the excess attached to the policy, the exclusions, restrictions, and so on.

For the purposes of our analysis of the PHI rebate and the MLS, we are primarily interested in the influence of price and income on the demand for insurance. Becker and Ehrlich (1972) showed that if prices are actuarially fair, then the demand for net insurance coverage (payout less the premium) will be a downward-sloping function of price. However, Hoy and Robson (1981) showed that the demand for *gross* insurance coverage may, in principle, be upward sloping (referred to in economics as a Giffen good), although they ruled out this possibility on empirical grounds.

If insurers incur costs in addition to insurance payouts, then an additional amount known as a *loading factor* will be needed to cover those costs. Even in a perfectly competitive insurance market in which each firm earns normal economic profits, the presence of such a loading factor means that premiums will exceed those that are actuarially fair. Thus consumers will demand less than full insurance coverage, even if they are very risk averse. The extent of coverage (known as the *coinsurance rate*) is increasing with the individual's degree of risk aversion. For a sufficiently large loading factor, zero insurance demand may be individually optimal. However, an increase in the loading factor may increase or reduce the individually optimal coinsurance rate if the individual has decreasing absolute risk aversion.

The reason for this ambiguous result is as follows. As a matter of theory, precisely predicting the effects of changes in income on insurance demand is not straightforward, although the economic reasons for this are relatively straightforward to understand. Consider, for example, the effect of higher income on insurance demand in the situation where an individual faced a loss that is fixed in size and is not related to income. Higher income is generally associated with a lower degree of risk aversion towards absolute dollar losses (this is known in the literature as declining absolute risk aversion, or DARA). If the individual faces prices that are actuarially fair (that is, the price of purchasing a dollar of coverage is equal to the probability of the loss), then the consumer always fully insures no matter what their income level. Thus, *if prices are actuarially fair, the income elasticity of demand for insurance is zero*.[7]

7 A referee questioned the empirical relevance of our discussion of no or negative income effects. Our discussion is simply drawing on the classic proposition that in the presence of fair insurance, one completely

On the other hand, if the consumer faces prices that are *not* actuarially fair (that is, price is greater than loss probability), then they will purchase less than full coverage, and an increase in income under DARA will make them less risk averse, which means that they will purchase *less* insurance. To understand this result, note that the act of *not* purchasing insurance is similar to the act of purchasing a risky asset for a typical investor. As an individual's degree of risk aversion falls, their demand for risk assets rises. Furthermore, as an individual's income rises, it is usually the case that their degree of risk aversion falls, given decreasing marginal utility of income. Thus, returning to the health insurance setting, the implication is that as an individual's income rises, their demand for the risky asset rises, and the demand for the asset that reduces risk — health insurance — falls. In other words, if individuals have declining absolute risk aversion, the demand for health insurance is an inferior good. Under these circumstances, the income elasticity of demand for insurance will be negative.[8]

## Lessons from standard consumer theory

Figures 1 and 2 use a standard diagram from microeconomic analysis to examine the economic effect of the MLS on the consumer's budget set or consumption possibilities. In Figure 1 the consumer can consume PHI and a composite good, labelled 'all other goods'. In the absence of the MLS, the consumer's budget set is enveloped by the solid black budget line, which describes the consumer's consumption possibilities when all income is spent. This budget line is affected by the consumer's income (which determines the overall position of the budget line relative to the origin) and the prices of each good (which determine the slope of the line).

In Figure 1 the consumer faces no MLS and chooses an amount of insurance equal to PHI.[9] But for a consumer with a given income and facing a given set of prices, the MLS creates a 'kink' in the budget line at the point defined by the 'adequate' amount of PHI (labelled 'Min PHI' in Figure 2). This happens for the following reasons. If the consumer purchases less PHI coverage than Min PHI, the MLS reduces their income by an amount equal to the MLS rate multiplied by their income. If, on the other hand, the consumer purchases PHI coverage

insures, regardless of one's income. So, rich and poor both completely insure, and the income elasticity of the demand for insurance is zero. Our point here is simply the sign of the income elasticity can in theory be positive, negative, or zero. We discuss empirical estimates of income elasticities below.

8 This was first proved by Mossin (1968). However, this result needs to be modified in the presence of demand-side moral hazard, which can return insurance to a normal good. The conclusion also fails to hold if losses are proportional to income.

9 Figure 1 has the consumer choosing, in the absence of the MLS, a PHI package that is less than the minimum needed to avoid the MLS. A referee commented that, in practice, such packages are unlikely to be available, and that the most likely choice in the absence of the MLS would simply be no insurance. This neglects the possibility that individuals in this situation may decide to self-insure, rather than purchase market insurance. Figure 1 allows for both possibilities.

that is at least equal to Min PHI, then they do not have to pay the MLS and the budget line is unaffected. The open circle at the lower point in the 'kink' reflects the fact that when the consumer purchases PHI that is even slightly less than the Min PHI, they will be subject to the MLS. But as soon as the minimum amount is purchased, the entire MLS is avoided. Thus the consumer's budget line is continuous from the right at the kink, but is not continuous from the left.

**Figure 1: The economics of the Medicare Levy Surcharge**

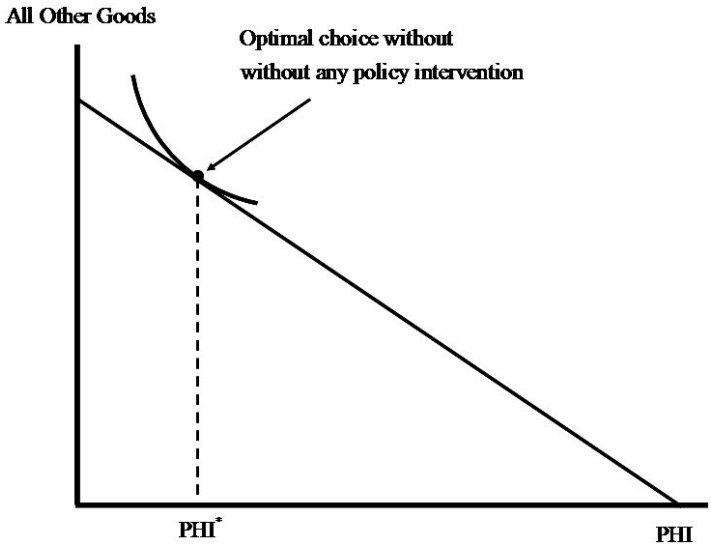
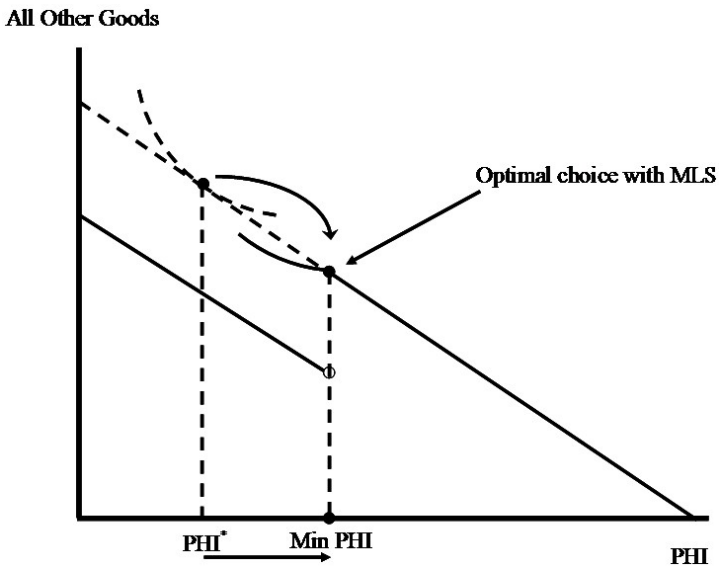



**Figure 2: A PHI rebate which is sufficiently large to induce all consumers to purchase PHI**



If the consumer ignores the intervention and pays the MLS, then less private health insurance is consumed than otherwise would be (assuming that PHI is a normal good),[10] and the consumer is worse off than if they purchase the minimum package and avoid paying the MLS.

If, on the other hand, the consumer uses his or her resources optimally, then in Figure 2 the minimal PHI package will be chosen. In this case, even though the consumer avoids paying the MLS, the threat of imposition of the MLS still makes the consumer worse off, compared to the situation in which the MLS is not imposed.

The welfare loss of the MLS is the utility loss between the original and the new situation, and can be measured in income terms as the amount of goods given up in order to avoid paying the MLS. It is the 'distance' between the two indifference curves in Figure 2.

Note that the MLS consists of two policy levers, both of which affect the consumer's behaviour. The first policy tool — the actual surcharge itself — varies in absolute dollar amounts for consumers of different income levels. That is, higher-income consumers face a greater absolute dollar penalty if they fail to purchase the minimal PHI package. The second policy lever is the minimum PHI package. This lever also influences the consumer's behaviour and in principle could also be used to influence PHI take-up.[11]

It is also important to note that the consumer's preferences and income may be such that he voluntarily chooses to purchase PHI even in the absence of the MLS — in which case the imposition of the MLS would have no effect. We label these types of consumers 'High PHI Valuation Consumers'.

Finally, suppose that the MLS is relatively low, or that the minimum PHI is relatively high compared to the consumer's choice in the absence of any package. The consumers may place such a low value on PHI (or the minimum package is defined to be very high relative to his initial choice) that they choose to pay the MLS rather than purchasing the minimum PHI package. But, as a consequence, because the consumer now has less income to spend, less PHI is also purchased

10 Butler (2002) estimates income elasticities of demand for private health insurance in Australia of 0.24 for hospital insurance, and 0.2 for ancillary insurance. For the purposes of this section, it is the sign rather than the size of the elasticity that is crucial.

11 Note also that the use of this approach for welfare analysis is only partially complete, because it ignores the economic distortions caused by the Medicare and public hospital system. If the benefits and costs to the individual of these additional interventions are taken into account, then the consumer's initial choice in the absence of the MLS in the diagram occurs in a second-best policy setting. In such situations, welfare analysis of additional distortions must be approached with a great deal of care. Indeed, in a second-best setting it is possible that the MLS could make consumers better off, once the effects of other policy interventions are taken into account.

(assuming insurance is a normal good). The MLS has perverse effects here, because it reduces the demand for PHI rather than increasing it.[12] We call these types of consumers 'MLS Payers'.

The above analysis suggests that there will be a threshold level of the MLS, beyond which the consumer would prefer to purchase the minimum PHI package than avoid purchasing it and paying the MLS. This threshold is the consumer's point of indifference between purchasing and not purchasing. Since consumer preferences vary, this threshold will vary among consumers according to their individual tastes.

## Implications of the MLS for the price elasticity of demand for private health insurance

The design of the MLS has some interesting and important implications for consumer demand behaviour and government revenue when PHI premiums are fixed. But the preceding analysis also has potentially even more important implications for consumer demand and government revenue when PHI premiums change.

One of the most important implications of the MLS is the effect that it can have on the responsiveness of demand to premium changes for certain consumers. For consumers who purchase the minimum PHI package in order to avoid paying the MLS (whom we will henceforth call the 'MLS Avoiders'), an increase in PHI premiums may have no effect on their demand for private health insurance, even though such a price change ordinarily (that is, in the absence of the MLS) would have an effect. In other words, these MLS avoiders will likely have a price elasticity of demand of zero.

The reason for this can be seen in Figure 1: if the consumer is purchasing the minimum package in order to avoid paying the MLS, then that same 'MLS avoidance' strategy will still be optimal for them after a small increase in the premium (a tilting inwards of the budget line). The premium increase certainly makes the consumer worse off, but the utility loss that the individual experiences as a result of the premium increase is not sufficiently high to induce them to purchase less or no insurance and incur the MLS.

Thus, one of the effects of the MLS is to eliminate the consumer's price responsiveness. Note the important implication that if there is imperfect competition on the supply side (which is almost certainly true in Australia),

12 On the other hand, this particular policy configuration maximises government revenue, as the consumer actually pays the MLS rather than avoiding it.

the reduction in the elasticity of demand brought about by the MLS will likely increase mark-ups, both reducing consumer welfare and increasing the additional total budgetary cost of the PHI rebate out when premiums rise.[13]

## The PHI rebate

The PHI rebate is an *ad valorem* (percentage) subsidy on purchases of PHI. The effect of this subsidy is to tilt the consumer's budget line around the vertical axis to the right, so that for the same amount of income and any choice of other goods, the consumer can now afford to purchase more PHI. Assuming that PHI is a normal good (or, if it is inferior, that the (positive) substitution effect outweighs the negative income effect of the lower price), the demand for PHI increases in response to an increase in the PHI rebate.

In the presence of the PHI rebate the key points regarding the incentive effects of the MLS all still hold. In particular, introducing the PHI rebate does not change the possibility that there will be a group of consumers — MLS avoiders — who will have zero price elasticity of demand in the presence of the MLS.

The key lesson from this analysis is that an individual consumer's behavioural response to changes in the PHI rebate is straightforward to analyse, but predicting the response to changes in MLS rates and thresholds depends on two broad factors:

- Income
- Preferences or willingness to pay for insurance, which in turn depend on risk characteristics and the degree of risk aversion.

If these two factors were perfectly (either positively or negatively) correlated, then analysing and predicting the *aggregate* effects of policy changes would be relatively easy. One would only have to know a consumer's income to immediately have a reasonable idea of their willingness to pay for insurance, and it would then be relatively straightforward to predict the aggregate effect of policy changes such as changes to the MLS which, as the preceding analysis shows, are income-related. On the other hand, if we knew the position of the individual's indifference curve for a given income level, it would then be possible to use the analytical framework outlined in this section to predict the consumer's behavioural response to changes in the MLS, and knowledge of the individual's income would be sufficient.

13 Note that the increase in margins (i.e. the benefit of the reduced elasticity of demand) may not be captured by the PHI funds if the upstream suppliers (such as private hospitals and specialists) have market power. In that case, they may be the prime beneficiaries of the inelastic demand.

However, for a variety of reasons, income and willingness to pay for private health insurance are not perfectly correlated. For example, individuals typically have different attitudes towards risk as measured by their degree of risk aversion, and thus within a given population of individuals, willingness to avoid risk varies not only as the *same* individual's income changes, but also across *different* individuals with the *same* income.

Thus, there are essentially two issues involved in the aggregate analysis of the effects of the MLS and the PHI rebate. The first is the impact of changes to the MLS and the PHI rebate on consumers considered by income level. The second is the impact by consumer level of risk; that is, as between low and high risks. If increasing the MLS increases the share of the PHI base that is high income, then (even with the rebate being income tested) the share of the rebate flowing to high-income groups is likely to rise. Moreover, assuming the supply side is imperfectly competitive, the reduction in demand elasticity brought about by the MLS will increase margins, and hence increase the dollar value of the rebate.

At the same time, it is likely that the marginal consumers who are forced into PHI by the increased MLS are low risk, which means both that there is a consumer welfare and associated efficiency loss (as those consumers value PHI at less than cost) and that the share of the rebate flowing to low risks rises. This shift in the risk composition of the PHI pool may have consequences for public outlays. If PHI and the consumption of health services are complements, or if the moral hazard problems associated with double coverage are material, then overall health costs may rise. This will also happen even if PHI and consumption of public services are substitutes, but high risks leave and low risks join the PHI pool.

To examine all of these effects, a simple analytical framework is needed to assess the possible aggregate effects of changes in MLS arrangements and the PHI rebate as incomes vary across the population. This is done in the next section.

## The interaction of the MLS and the PHI rebate as consumer incomes vary

Because the incidence of the MLS depends on consumer incomes, it will affect different consumers differently. Moreover, the changes proposed in the FPHII (2011) Bill would also make the PHI rebate dependent on income. Understanding how the two policy tools can interact with each other across different income levels is crucial for understanding the possible aggregate effects of future changes to the MLS and the PHI rebate.

## Analytical framework

To understand this interaction across a population of different incomes, we use Figure 3 below, which plots income on the horizontal axis and willingness to pay for PHI, together with financial incentives, on the vertical axis. In the analysis that follows, we allow incomes to vary but assume that each consumer has an identical willingness to pay for PHI, which we also assume to be less that the price of the package. In other words, in the analysis that follows, we assume that without policy intervention, no consumer would purchase PHI.

In this environment, consider the effect of introducing a non-means tested PHI rebate. Since consumers are all assumed to have the same willingness to pay for PHI and since the rebate is not means tested, there are two possible outcomes: either all consumers now purchase PHI, or none will.

Figure 3 shows the situation where the rebate is sufficiently high to induce all consumers to purchase PHI — the difference between willingness to pay and the new subsidised price is positive. In this figure and the ones that follow, aggregate demand for (or take-up of) PHI is measured from right to left — it is the fraction of consumers whose net willingness to pay (inclusive of PHI rebate 'carrots' and MLS 'sticks') exceeds zero. The budgetary cost of the rebate scheme is the price of PHI multiplied by the subsidy rate, multiplied by the take-up rate and is given by the shaded area in Figure 3. MLS revenue is given by the tax rate, multiplied by the incomes of individuals who are above the MLS threshold but who do not purchase PHI.

**Figure 3: The MLS when the PHI rebate is sufficiently large to induce all consumers to purchase PHI**

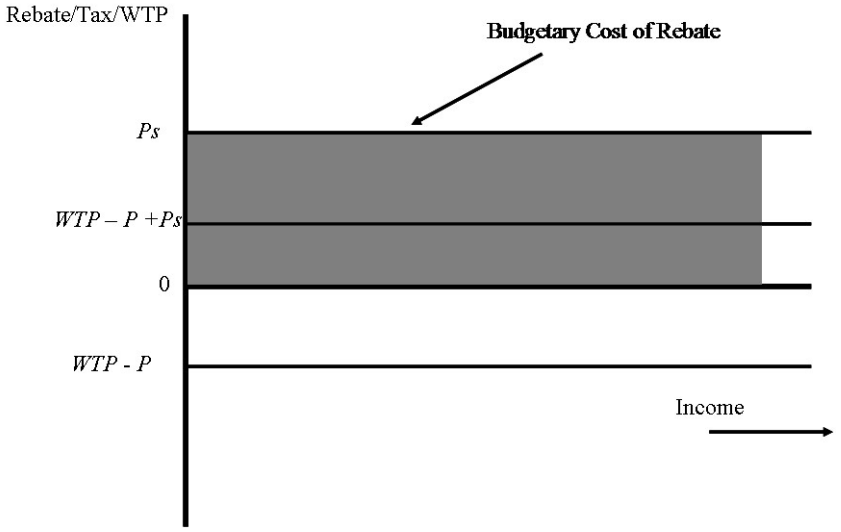
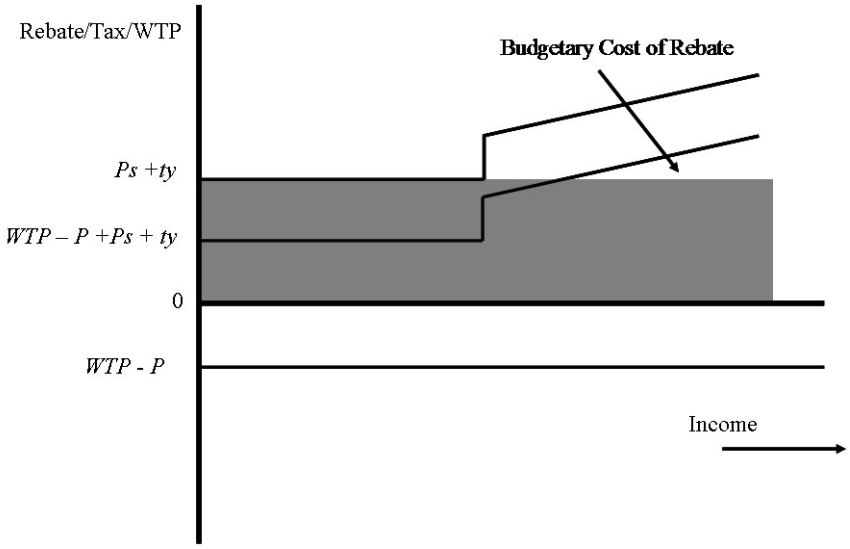


Figure 4 below shows a situation in which the MLS is introduced. The introduction of the MLS creates a kink in the net willingness-to-pay curve at the MLS threshold. For individuals on incomes exceeding this threshold, there is an additional tax levied on all income earned. The slope of the line is the MLS rate. In deciding whether to purchase PHI, the individual now assesses whether the willingness to pay, less the subsidised price, plus the MLS payment is greater than zero. With an MLS this sum is now a function of income, and is shown by the top line in the figure.

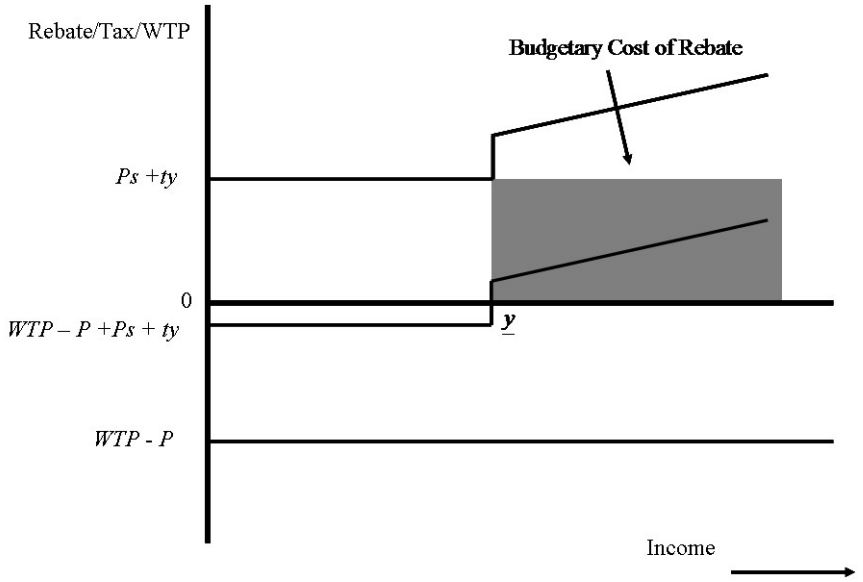
The PHI take-up rate is given by the fraction of individuals for which this kinked line is above the horizontal axis. In Figure 4, this is true for all income levels, and so there is 100 per cent take-up of PHI — and no individuals actually pay the MLS. The budgetary cost of the rebate is given by the shaded area.

**Figure 4: The MLS affects consumer behaviour but collects no revenue**




If the PHI rebate is low relative to willingness to pay, the MLS may play a role in inducing individuals to purchase PHI when they otherwise would not. In Figure 5, the MLS increases the cost of not purchasing PHI for those individuals above the threshold, which is again indicated here by $\underline{y}$. In this example, all individuals to the right of this cut-off point purchase PHI. However, since all individuals above the MLS threshold purchase PHI, *there is no revenue from the MLS*. Nevertheless, even though no individual pays the MLS, its presence still has an effect on individual incentives and behaviour.

**Figure 5: An increase in the MLS rate and threshold which increases PHI take-up**




## Changes in Policy Parameters

The above framework can be used to qualitatively analyse the effects of changes in the main policy parameters (the PHI rebate rate, the MLS threshold, and the MLS rate) on PHI demand, tax revenue, and the budgetary cost of the rebate.

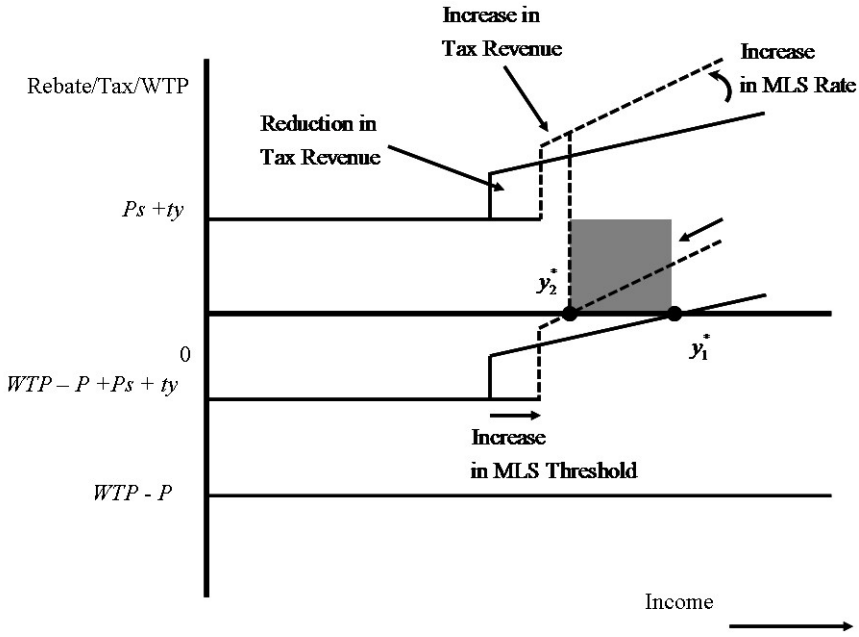
### A combined increase in the MLS rate and the MLS threshold

Consider, for example, the effects on PHI demand of a combined increase in the MLS threshold and MLS rate. The overall effects are ambiguous, and the reasons can be understood by examining Figure 6: on the one hand, an increase in the MLS threshold may either reduce PHI take-up or have no effect. On the other hand, an increase in the MLS rate (an increase in the slope of the net WTP line) unambiguously increases take-up. Combining the two policies yields an ambiguous outcome.

The case where the latter effect more than offsets the former (so that PHI demand increases) is shown below. The new higher MLS rate affects individuals who originally do not wish to purchase PHI. The change in the threshold in Figure 6 is drawn so that it has no effect on its own. In this case, it is the change in the MLS rate that does all of the work by increasing the financial incentive to take out PHI for the group of consumers with incomes between $y^*_1$ and $y^*_2$. The

government collects less revenue as a result of the threshold falling, but raises more revenue as a result of the MLS rate increasing. PHI take-up rises, and thus the budgetary cost of the rebate rises as well.

**Figure 6: The effect of a reduction in the PHI rebate for incomes above a certain threshold**

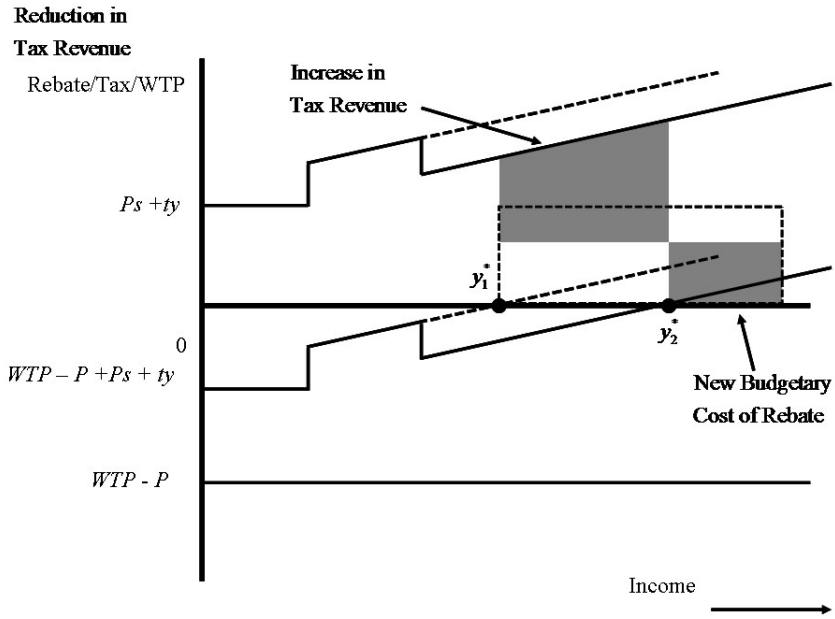



## The effect of means testing the PHI rebate

Means testing the PHI rebate is also straightforward to analyse within this framework. To isolate the effects of this policy change, we examine the effect of establishing a threshold beyond which the PHI rebate is reduced.

The policy change either has no effect or reduces PHI take-up. The latter case is illustrated in Figure 7 below. The PHI rebate is reduced for individuals with income above the level indicated, and the reduction induces some individuals to drop their PHI cover. As a result, PHI take-up falls to $y^*_2$, the budgetary cost of the PHI rebate falls, and MLS revenue increases.

**Figure 7: Means testing the PHI rebate reduces PHI take-up**




It is also straightforward to draw the diagram so that means testing the PHI rebate has no effect on PHI take-up. The reduction in Figure 7 may simply not be large enough to affect consumers who are already purchasing PHI. The only effect of such a policy change in these circumstances would be to reduce budgetary PHI rebate outlays.

## Discussion of results and broader consequences for private health insurance in Australia

This paper has presented an analytical framework for examining changes in the PHI rebate and the Medicare Levy Surcharge. The analysis shows that there are many subtleties involved in assessing the effects of these policies on PHI take-up rates, tax revenues, and budgetary outlays.

Simultaneously increasing the MLS rate and threshold will have an ambiguous effect on PHI take-up rates, whilst means testing the PHI rebate cannot increase PHI take-up, and will reduce it in some circumstances. Ultimately, the actual effect on PHI take-up rates of policy changes (such as those that have been proposed by the Australian Government) is an empirical matter that cannot be settled by theory alone.

Complicating all of this is the effect that existing and proposed policies have on underlying market parameters. One of the key unambiguous conclusions of this paper is the effect of policy instruments on market price elasticity of PHI demand. This elasticity falls as more individuals that are left in the PHI pool become MLS avoiders as a consequence of ever-higher MLS rates.

Depending on the degree of imperfect competition in the PHI market, the reduction in the overall price elasticity of demand may also provide an additional incentive for PHI providers to increase mark-ups (the excess of price above cost). To the extent that low-income consumers of PHI tend to be relatively more price elastic (and to the extent that PHI providers cannot price discriminate on the basis of income), this would result in higher premiums for those that remain in PHI, which could drive up PHI rebate outlays. It could also result in a second round of low-income consumers leaving PHI, with the initial effect on higher demands for public resources and waiting times exacerbated as the price of PHI rises.

A lower overall price elasticity of demand may also have less direct (but no less significant) implications for upstream firms in the health industry and for consumers of those services. Suppliers of inputs (such as specialists, diagnostic providers, and private hospitals) may themselves respond to lower PHI elasticities by increasing their own prices, in an attempt to 'capture' the additional rents that are created when consumers of a complementary good become less willing to change their behaviour in response to price increases. This increase in supplier costs would in turn have further negative implications for public outlays, particularly for specialist charges that are covered under the Medicare system. To the extent that public hospitals are budget-constrained and compete for the same input suppliers as private providers, there will be further rationing of these services in the public system, reducing the welfare of public patients.

These consequences point to greater pressure being placed on the public system and budgetary outlays. Note that, because of the effect of higher MLS rates on the price elasticity of demand for PHI, these indirect effects that we have discussed here could still occur, even if those MLS changes did not directly result in lower overall PHI demand. In other words, one of the unintended consequences of increasing MLS rates could be to drive up costs in the public system, but this effect is conceptually distinct from the usual mechanism through which public outlays would increase as a result of lower PHI take-up.

There may also be another set of consequences for suppliers and the pool of PHI consumers that continue to purchase PHI. To the extent that low willingness to pay reflects low risks, and to the extent to which low-income, low-willingness-to-pay consumers drop their PHI cover as MLS thresholds rise, the overall

riskiness of the remaining pool of PHI consumers will increase, exacerbating adverse selection problems and driving up provider costs and pressure on premiums. The extent to which this would set off an 'adverse selection death spiral' in which a riskier pool of remaining consumers increases costs, drives up premiums, and results in further reductions in PHI demand depends on exactly how many low-risk consumers drop their PHI cover.

Even if adverse selection problems are not exacerbated, the reduction in overall PHI demand (for a given set of PHI prices) would mean that marginal PHI providers would be forced to exit the industry, reducing competitive pressure among suppliers and placing further upward pressure on PHI premiums. This would mean that annual regulatory decisions regarding PHI premium increases would take place in an environment of reduced competition and less switching between providers, as well as a lower overall price elasticity of demand.

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# Removing Duplication in Public/Private Health Insurance in Australia: Opting Out With Risk-adjusted Subsidies?

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Wynand P. M. M. van de Ven[1]

## Abstract

*Australia's existing health-financing arrangements lead to partial duplication in coverage for private health insurance (PHI) holders. The two options to remove duplication are: 1) allowing individuals to 'opt out' from Medicare either (a) by purchasing PHI or (b) by self-insuring via medical savings accounts or other pre-payment arrangements; 2) confining PHI to the coverage of supplementary services. This paper argues in favour of Option 1(a), and argues that from an efficiency perspective PHI should be fully substitutive of Medicare coverage (that is, 'opting out' should be allowed); community rating should be replaced by premium bands; and the 30–40 per cent* ad valorem *subsidy for PHI should be replaced by* ex-ante *risk-adjusted subsidies.*

## Introduction

Following the introduction of Australia's universal tax-financed national health insurance in 1984 (that is, Medicare), the proportion of the population covered by private health insurance (PHI) declined from about 50 per cent to about 30 per cent in 1997. This suggested that an equilibrium secured by stable waiting lists in the public sector and stable levels of coverage by PHI was not emerging. Since 1997, several major policy changes have been introduced to redress this situation. These included the introduction of two forms of explicit subsidy in the competitive PHI market: a 30 per cent *ad valorem* premium subsidy (that is, premium rebate) to individuals who purchase PHI, and a tax penalty of 1 per cent of taxable income payable by single individuals with taxable incomes

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in excess of $70 000 p.a. ($140 000 p.a. for couples) if they do not hold PHI (the Medicare levy surcharge).[2] A Lifetime Health Cover policy was also introduced with effect from July 2000 with an age penalty being imposed on individuals who first purchased private health insurance after age 30 years.[3]

While collectively the policy changes introduced since 1997 appear to have stabilised PHI coverage at around 45 per cent of the population, there still remain unresolved issues related to the design and interconnection between public and private healthcare financing. In this paper, we focus on one particular issue — duplication of insurance coverage and consequent over insurance, and its effects on efficiency and equity. In Australia, subsidised PHI does not lead to any reduction in coverage under the public insurance scheme (Medicare); that is, the full range of insurance benefits under Medicare is available to all eligible Australian citizens regardless of whether or not they purchase PHI.

This paper first discusses the possible rationales for subsidising PHI in Australia, given the presence of a compulsory tax-financed scheme (Medicare) under which a broad range of services may be accessed by all eligible residents. It then argues, taking the decision to subsidise PHI as given, that the current complex mix of subsidies (community rating, combined with claims equalisation and *ad valorem* premium subsidies)[4] is not optimal and that *ex-ante* risk-adjusted subsidies would better optimise the trade-offs between affordability, efficiency and incentives for risk selection. Finally the problem of duplicate coverage is considered, and it is argued that the overlap arising from duplication can be removed by either diminishing the role of PHI so that it is confined to providing supplementary coverage only or by allowing 'opting out' from Medicare coverage for those who purchase PHI; that is, making PHI fully substitutable for Medicare.[5] This paper considers the second of these options and outlines

2 The characterisation of the Medicare levy surcharge as an explicit subsidy is based upon the argument that the exemption of those with private health insurance from the levy gives rise to a tax subsidy or tax expenditure for private health insurance; that is, the government's revenue from the levy is lower than it would be in the absence of the exemption. Using only those respondents in the Australian Bureau of Statistics 2004–05 National Health Survey who indicated they purchased private health insurance expressly for the purpose of avoiding the Medicare levy surcharge, Macintosh (2007) estimated this revenue loss to be in the range $110 million to $250 million, with a best estimate of $230 million. The Treasury, in preparing its annual estimates of tax expenditures, treats the surcharge as a negative tax expenditure, with the revenue raised from the surcharge then being included as an offset against other tax expenditures (The Treasury 2008, Table A26).

3 For a more detailed discussion of these policy changes, see Butler (2002).

4 The PHI market is subject to community rating regulations that require any particular policy be sold at the same premium to all buyers. Premiums can vary between policies, and can also vary for the same policy if an age penalty applies under the lifetime health cover regulations. As community rating provides an incentive for insurers to avoid coverage of high-risk groups, open enrolment is required. Also, as community rating can result in fluctuating financial positions for insurers according to the exogenous mix of risks that purchase their policies, a reinsurance scheme has been in place for many years. Although the reinsurance scheme has been modified and renamed 'risk equalisation' in 2007, it is *de facto* a claims equalisation scheme designed to redistribute funds *ex-post* from insurers with below-average claims to those with above-average claims.

5 The option of allowing individuals to opt out by self-insuring via medical savings accounts or other pre-payment arrangements is discussed elsewhere (Butler 2010).

how consumer choice between Medicare and PHI combined with a system of risk-adjusted subsidies would improve incentives for efficiency and remove duplicate coverage.[6]

# Subsidising private health insurance in Australia: Why?

In the following sections, we discuss whether and to what extent the current system of subsidies in the Australian PHI market can be justified on economic grounds or on the basis of country-specific policy arguments. Furthermore, we discuss the main problems with the current system of organising subsidies in the Australian PHI market.

## Economic and country-specific arguments

From an economic perspective, subsidisation in competitive PHI markets can be justified as a direct way to achieve the goal of affordable access to (the coverage of) healthcare services for vulnerable groups (for example, low-income or high-risk individuals). The main economic rationales for governments to introduce subsidies with the purpose of achieving affordability and stability within competitive PHI markets are the potential for risk-rating and risk-selection,[7] the financial risk of becoming a bad risk,[8] and the presence of egoistic and altruistic externalities in the demand for healthcare services or coverage (Paolucci 2011; Paolucci *et al*. 2007; van de Ven and Schut 2007; Paolucci *et al*. 2006; van de Ven and Ellis 2000).

In addition to the economic arguments for subsidies, there may be also country-specific policy arguments to subsidise PHI. In the Australian private health insurance market, a complex system of subsidies has been introduced to achieve a multiplicity of policy goals, such as addressing the affordability, stability and attractiveness of PHI; decreasing the pressure on the public system by giving consumers more choice of coverage and services and by encouraging people to

6 See Butler (2008) for a discussion of the first option which would result in most coverage being provided by the national health insurance scheme with private health insurance covering only those services not covered by the public scheme.

7 Risk selection may result in high-risk individuals not being able to afford to buy insurance or insurers refusing to offer policies to high-risk individuals. It may also lead insurers to exclude from coverage (some) pre-existing medical conditions. Another form of selection is to design insurance policies to attract favourable risk-groups. Risk selection may have several effects, such as instability in the insurance market, a continuous exit of insurers due to bankruptcy, a welfare loss due to the inability to buy the preferred insurance coverage, and high prices for high-risk individuals (see, for example, Rothschild and Stiglitz 1976; Wilson 1977; Schut 1995; Newhouse 1996).

8 See, for example, Pauly 1992: 140; Cutler 2000.

take out PHI; and ensuring a balance between the public and private health sectors (The Department of Health and Aged Care 2000: 11). The underlying idea behind these country-specific motives is that subsidising the purchase of duplicate PHI will result in less pressure on the public scheme. In particular, it would result in reduced public spending in healthcare, by bringing in private resources and by increasing consumer choice. Subsidising PHI for services already covered by Medicare is therefore seen as an indirect way to achieve affordable access to healthcare services for everyone.

## The current system of subsidising private health insurance in Australia is not without problems

Although in general subsidies in competitive PHI markets may be justified on the basis of the above-mentioned economic and country-specific policy arguments, it appears that the current system of subsidising PHI in Australia is not without problems. In this section, we discuss several problems related to subsidising (duplicate) PHI that are specific to the design of the public/private mix in healthcare financing in Australia (and may be relevant also for other countries with a similar design — Ireland, for example).

### Is subsidising duplicate private health insurance coverage necessary and proportionate to achieve affordability?

Although the introduction of subsidies in competitive PHI markets can be justified to achieve the goal of affordable access to healthcare services, it is questionable whether subsidising PHI is *necessary* and *proportionate* in the Australian context given the presence of a subsidised (that is, tax-funded) universal public insurance scheme (that is, Medicare) that covers wholly or partly a broad range of services. In particular, the national public-health insurance scheme (Medicare) is explicitly designed to guarantee affordable and equitable access to healthcare services in Australia (Department of Health and Aged Care 2000). Similarly, in other countries with a National Health Service or Scheme (NHS) such as Canada, France, Ireland, Italy, and the United Kingdom, the primary objectives of the NHS are to provide affordable and equitable access to healthcare services (Cutler 2002). Medicare and PHI coverage for the costs of several healthcare services overlap to a large extent, and PHI holders retain full access to Medicare coverage (that is, no opt-out). The overlap between public and private insurance coverage leads to a duplication of coverage and subsidies that raises concerns about *ex-ante* and *ex-post* moral hazard. Furthermore, duplication of coverage and subsidies for the same set of services involves higher *transaction costs* than a single universal health insurance scheme (Medicare) (Paolucci 2010) and it may lead to cost-shifting (Morrisey 2003; Scotton 1995). In sum, according to the economic rationales there is no direct motive to introduce a system of

subsidies in the Australian PHI market if affordable access to (the coverage of) healthcare services is already guaranteed by a universal publicly tax-funded scheme (Medicare). Therefore, subsidising duplicate PHI in Australia, given the presence of a universal public insurance scheme, is not *necessary* to achieve an affordable access to healthcare services. Moreover, it is also not *proportionate* because duplication of coverage and subsidies may lead to over-insurance, high transaction costs and cost-shifting, and thereby to inefficiencies.

## Is the current system of subsidising private health insurance an effective way to decrease the pressure on public financing?

The proportion of Australians holding PHI has increased by 14 percentage points in the last 10 years, from 30 per cent (1998) to about 45 per cent (2010), as a result of the introduction of several forms of subsidies to encourage individuals to purchase PHI (for example, Medicare levy surcharge, 30–40 per cent premium rebate, Lifetime Health Cover). Nevertheless, the overall share of total recurrent health expenditure privately financed (including PHI and out-of-pocket expenditures) is now lower than it was a decade ago, having fallen from 34.2 per cent in 1996–97 to 31.3 per cent in 2006–07. Moreover, this seems to be attributable to an increase in out-of-pocket expenditures rather than in PHI expenditures (see Table 1). The increase in the percentage of the population covered by PHI has apparently not been accompanied by a proportionate increase in the share of PHI expenditures in health financing. PHI expenditures as a proportion of total healthcare expenditures have fluctuated between 7–11 per cent in the last 10 years but the downward trend is clear. This unexpected finding between the increasing percentage of PHI holders and the decrease of the PHI share in total healthcare expenditures may be attributed to two main reasons. First, those who are *purchasing* PHI are not *using* it as much as they could because they can continue to use (and probably do so) the public system (Moorin and Holman 2007; Lu and Savage 2006; Moorin and Holman 2006). Second, there are large public expenditures (that is, subsidies) associated with PHI policies, so the increase in PHI coverage is likely to have contributed to an increase, rather than a decrease, in public expenditures. As a result, the current system of subsidising PHI in Australia appears not to have been an effective way to decrease the pressure on public financing.

**Table 1: Percentage of total recurrent health expenditure financed from private sources, Australia, 1998–99 to 2008–09**

| | PHI[a] | OOP[b] | Other non-govt | Total private share, all sources[c] |
|---|---|---|---|---|
| 1998–99 | 8.0 | 17.3 | 7.8 | 33.0 |
| 1999–00 | 6.9 | 16.7 | 7.3 | 30.8 |
| 2000–01 | 7.1 | 18.0 | 7.2 | 32.3 |
| 2001–02 | 8.0 | 17.5 | 7.2 | 32.8 |
| 2002–03 | 8.0 | 16.7 | 7.3 | 32.0 |
| 2003–04 | 8.1 | 17.5 | 7.3 | 32.8 |
| 2004–05 | 7.7 | 17.4 | 7.1 | 32.3 |
| 2005–06 | 7.6 | 17.4 | 6.9 | 32.0 |
| 2006–07 | 7.6 | 17.4 | 7.2 | 32.2 |
| 2007–08 | 7.6 | 16.8 | 6.9 | 31.3 |
| 2008–09 | 7.8 | 16.8 | 5.7 | 30.3 |

*Notes:* [a] Private Health Insurance; [b] Out-of-pocket Expenses, [c] the sum of columns 1–3.

*Source:* AIHW (2010)

## Is the current system of subsidising private health insurance effective in providing incentives for reducing waiting times in the public hospital sector?

One may question whether, under the current mix of public and private (duplicate) coverage for the costs of care delivered by public and private providers, there are incentives for the government and physicians to achieve a stable equilibrium with acceptable waiting times in the public sector (Scotton 1990). In particular, there appear to be perverse incentives for the government not to reduce waiting times in the public sector because the more it succeeds in doing so, the more it will reduce the demand for PHI. Furthermore, there also seem to be perverse incentives for physicians not to reduce the waiting times in the public sector because this would imply a reduction of demand for their own services in the profitable private sector.

## Is the current system of subsidising private health insurance effective and efficient in tackling selection in the private health insurance market?

Adverse selection (high-risk individuals are more likely to buy PHI than low-risk groups) has been a persistent problem in the Australian PHI market (Butler 2003; Connelly and Brown 2006), particularly after the introduction of Medicare (1984). As mentioned above, Medicare is a universal tax-financed public insurance scheme that provides coverage for care delivered in public hospitals to public

patients at zero-price; subsidies for inpatient and outpatient care delivered by private medical practitioners; and subsidies for a broad set of services such as included in the Medical Benefits Scheme (MBS) and the Pharmaceuticals Benefit Scheme (for example, pharmaceuticals, pathology, diagnostics, and allied healthcare services such as optometry). Before the introduction of Medicare, most Australians were privately insured — 77.6 per cent in June 1971 (PHIAC 2008a). After its introduction and the subsequent substantial increase in public-sector direct healthcare expenditures, PHI coverage fell. In June 1984, 50 per cent of the population held PHI and in 1997 only 30 per cent (Butler 1998). The decline in PHI coverage, which does not provide *per se* an indication of adverse selection, was accompanied by a crowd-out of low-risk groups from PHI coverage and an increase in high-risk individuals buying PHI.[9] The empirical evidence of an adverse-selection death spiral is quite straightforward. For example, in the period between 1984 and 1998, while the percentage of people with PHI fell by 14 percentage points, PHI coverage in the 70+-year-old population increased from 31 per cent to 37 per cent while in the 25–34-year-old population it fell from 46 per cent to 22 per cent (Connelly and Brown 2006).

Between 1997 and 2000, several measures were introduced by the government to increase and stabilise private health insurance coverage, such as the Private Health Insurance Incentives Scheme (PHIIS), the 30 per cent subsidy to all PHI-holders, and the Lifetime Health Cover (LHC) scheme which involves age-based penalties for late joiners, with the penalties commencing at age 31 (Hall *et al*. 1999; Butler 2002). Overall, these measures have had a positive effect on PHI take-up. In 2000, coverage increased from 31 per cent to 43 per cent of the population. However, although these measures have been effective in increasing PHI coverage and have improved the risk profile within the pool of PHI holders, Brown and Connelly (2005) have shown that the adverse-selection problem has not been solved. In particular, they show evidence — based on the age composition of the insurance pool — of the re-commencement of an adverse-selection death spiral in the post-LHC period. The most recent changes (2005–2007) introduced within the PHI market appear to reinforce rather than redress the adverse-selection problem. In particular, the increased rebate for 65+-year-olds (35 per cent) and for 70+-year-olds (40 per cent), the extension of PHI coverage to long-term services and the reduction in the maximum duration of the LHC age penalty from 35 years to 10 years are likely to create additional incentives for worse risks to buy PHI coverage. In a PHI market with community rating and open enrolment, this is likely to result in increased selection. All in

9 Many agree that the downward spiral in coverage in the Australian PHI market reflected adverse selection induced by regulation such as community rating (and open enrolment) (Butler 1998, 2003, 2007; Connelly and Brown 2006). However, Vaithianathan (2004) has argued that private health insurers have circumvented the adverse-selection effect of community rating through plan design (for example, by offering policies with more exclusions that are cheaper and have more appeal to the young and healthy).

all, the current system of subsidies within the Australian PHI market has not been able to tackle the problem of adverse selection, which appears to be a constant threat to the stability of the Australian PHI market.

## Political and regulatory instability

There have been many changes in the regulatory environment for PHI over the last few decades. As a result, private health insurers are subject to a considerable degree of sovereign risk.[10] For example, while the current 30 per cent *ad valorem* subsidy for private health insurance appears to have bi-partisan support in the Commonwealth Parliament, a change in this policy by the government could affect the financial positions of private health insurers. Another example is the announcement by the government in May 2008 of its intention to increase the income thresholds at which liability for the Medicare levy surcharge commenced from $50 000 per annum for singles and $100 000 per annum for families to $100 000 and $150 000 respectively. The share price for NIB (a private health insurer that demutualised in late 2007) fell over a few days from around $0.92 before the announcement to $0.70 after the announcement, and fell further to around $0.56 over the following five to six weeks.[11] On 16 October 2008, the Federal Parliament passed legislation to set the MLS threshold to $70 000 per annum for singles and $140 000 for couples.[12] More recently, in the 2009–10 Federal Budget, the government proposed as a savings measure, justified by the contingent budgetary constraints imposed by the GFC, to means-test the rebate. At the same time, it proposed to progressively increase the MLS from 1 per cent to 1.5 per cent for those in the highest income bracket who do not have PHI.[13]

In sum, the current system of subsidies for duplicate PHI does not seem to achieve the main policy goals of PHI in Australia, such as to decrease the financial pressure on the public scheme and to increase the affordability and fairness in access to healthcare services for everyone. It also appears to leave unsolved several problems such as over-insurance, high-transaction costs, cost-shifting, perverse incentives with respect to waiting times, and adverse selection. Therefore, we conclude that if affordable access to healthcare services is guaranteed by the tax-financed public health insurance scheme (Medicare), subsidising PHI is *unnecessary* to achieve an affordable access to (the coverage of) healthcare services already covered by Medicare, and also *disproportionate* because it creates instability and inefficiencies in the market.

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10 In the current context, 'sovereign risk' refers to the risk that government will use its power to change the regulatory environment and thereby affect the financial position of private health insurers.

11 Share price data from Australian Stock Exchange (http://www.asx.com.au).

12 Medicare Levy Surcharge Thresholds Bill No. 2, 2008.

13 For a detailed description of these proposed measures and their effects on PHI demand we refer to Robson *et al*. (2010) and to a report by Access Economics (2009).

# Subsidising private health insurance in Australia: How?

Notwithstanding the arguments in the section above, if subsidies are to be provided for PHI in Australia, what strategies for subsidising PHI can be used and what are the economic characteristics of each? Following van de Ven and Schut (2007), we consider four different strategies:

- Risk-adjusted premium subsidies
- Premium-based subsidies
- Premium-rate restrictions
- Excess-loss compensation.

## Risk-adjusted premium subsidies

Risk-adjusted premium subsidies are determined so as to reflect an individual's expected healthcare expenses over the time period covered by the insurance contract (for example, one year). The risk adjusters most commonly employed are age and health status. The subsidies may be paid to either the consumer or the insurer.[14] This strategy rates highly in terms of achieving affordability of PHI because higher risks receive commensurately higher subsidies. This will provide considerable financial protection against high premiums as long as the risk adjusters used to set the subsidies reflect the risk factors used by insurers to set premiums. It also rates highly in terms of efficiency. Consumers will pay 100 per cent of the premium variation between insurers at the margin, providing strong incentives to them to shop around and to insurers to compete on premiums. It also improves efficiency by providing insurance against the risk of becoming a high risk.[15] Incentives for risk selection are also minimised, again conditional on the same risk adjusters being used in setting premiums and subsidies. There may be problems, however, in determining risk-adjusted subsidies for very high-risk individuals with rare conditions, for whom it is technically difficult to predict health expenditures with an acceptable degree of accuracy.

14 In most countries, risk-adjusted subsidies are paid directly to the insurer (see van de Ven and Ellis 2000; van de Ven and Schut 2008).

15 The premium for an insurance contract is guaranteed only for the period of the contract (for example, one year). Upon renewal, the premium may change so that if a consumer's health status has deteriorated and they become a high risk then they will pay a higher premium.

## Premium-based subsidies

Premium-based subsidies may be simpler to administer than risk-adjusted subsidies but may not achieve affordability of PHI for high risks if they subsidise only a set proportion of the premium. They also provide less incentive for consumers to shop around between insurers because consumers are less price sensitive at the margin (for example, consumers do not bear 100 per cent of any premium difference between competing insurers). An additional source of inefficiency arises from the subsidisation of premium differences between insurers regardless of the source of that difference, potentially leading to premium inflation. Premium differences between insurers may reflect inefficiencies that should not attract a subsidy (that is, misallocation of subsidies). Finally, they do not directly counter incentives insurers may have for risk selection, particularly if premium rate restrictions are also imposed on insurers.

## Premium-rate restrictions

Premium-rate restrictions encompass regulations such as community rating, restrictions on the use of certain risk factors such as genetic test information, and rate banding whereby the range of variation in insurance premiums between different risks is restricted.[16] These regulations do not, in and of themselves, entail any direct subsidy of private health insurance from a third party such as government. They can, however, result in internal implicit cross-subsidies within an insured pool, from low risks who pay more than actuarially fair premiums to high risks for whom the opposite is true. While such restrictions may appear to improve affordability, insurers can, to a greater or lesser extent, potentially circumvent them. For example, community rating on a 'per insurer per product' basis leaves open the possibility that insurers will circumvent the regulation through plan design, offering plans with exclusions at lower premiums that will be more attractive to low risks, and plans with fewer, if any, exclusions at higher premiums that will be more attractive to high risks. Premium-rate restrictions score poorly with regard to efficiency as risk-averse low risks who would be prepared to purchase insurance at actuarially unfair premiums may find the premiums too unfair and not purchase cover. They also score poorly with respect to selection, providing incentives for insurers to avoid providing cover for high risks who give rise to predictable losses ('lemon dropping') and to compete on plan design as just discussed.[17]

16 Community rating can be regarded as an extreme form of rate banding where premium variation between different risks is constrained to zero.

17 The term 'lemon dropping' connotes the opposite behaviour to 'cherry picking', the latter referring to incentives for insurers to actively enrol low risks which, under rate restrictions, generate predictable profits. It is discussed in more detail in van de Ven and Schut (2007), who ascribe the intellectual origin of the term to Victor Fuchs.

## Excess-loss compensation

Excess-loss compensation is usually adopted as a complement to premium-rate restrictions. Notwithstanding the behavioural incentives for insurers under rate restrictions to engage in selection and secure a pool of individuals with a favourable risk profile, insurers may still incur losses if the exogenous composition of their risk pool results in an unfavourable risk profile (that is, too many individuals for whom premiums are lower than the actuarially fair amount). These excess losses can be mitigated by arranging for compensation to be paid from other insurers who experience excess profits. While excess-loss compensation reduces the incentive for selection by insurers, the design of the scheme must be such that it does not create perverse incentives for insurers by over-compensating them for excess losses.

Generally, there is no one strategy that dominates all others when appraised against the criteria of affordability, efficiency and selection (Table 2), as all involve some trade-off between the three criteria. The strategy or combination of strategies, selected by policymakers will then depend upon the relative weight attached to each criterion. However, it can be argued that risk-adjusted premium subsidies are the preferred strategy. This is because, to the extent that all relevant risks are included and both insurers and the 'sponsor' (government) use the same set of risk adjusters, there will be less need to rely on complementary strategies and the resulting trade-off between the three criteria will be less severe.[18] Current private healthcare financing arrangements in Australia rely on a blend of premium-based subsidies (the 30–40 per cent rebate for PHI premiums), premium-rate restrictions (community rating) and excess-loss compensation for insurers (the risk-equalisation scheme, formerly known as the reinsurance scheme) but place no reliance on *ex-ante* risk-adjusted subsidies. The foregoing arguments suggest that the affordability, efficiency and selection criteria may be met by switching to a system of risk-adjusted subsidies for PHI. At the same time, the community-rating regulation could be removed, as the risk-adjusted subsidies should substantially lessen the differences in net premiums faced by consumers. If it is thought that the resulting differences in net premiums are too wide to be socially acceptable, a rate-banding regulation could be introduced which would constrain the ratio of the highest to the lowest premium charged by any insurer net of the subsidy (for example, a high/low premium ratio of 10:1). The major advantages of this approach are reduced incentives for selection and cream-skimming by insurers; less adverse selection by consumers (high risks buying PHI and low risks avoiding it); PHI becomes more attractive for low risks (because of their lower premium); and increased

18 See van de Ven and Schut (2007) for a fuller exposition of this argument.

incentives for efficiency for both the consumers (because then they are fully price sensitive at the margin) and for insurers (who are confronted with price-conscious consumers).

**Table 2: Affordability, efficiency and selection under different strategies to make individual health insurance affordable for high risks in a competitive insurance market with open enrolment**

| Strategy | Affordability | Efficiency | Selection |
|---|---|---|---|
| Risk-adjusted premium subsidies (or risk equalisation) | Can significantly improve affordability as risk-adjusted subsidy should substantially reduce variations in net premiums paid by insured | • Consumers pay 100 per cent of the premium variation between insurers at the margin, giving them incentive to shop around and insurers incentive to compete on premiums<br>• Provides insurance against the risk of becoming a high risk<br>• Depending on risk factors used by insurers, may be some reduction in the incentive for efficiency; for example, if insurers use 'prior costs' as a risk factor | No incentive for selection if insurers charge risk-rated premiums |
| Premium-based subsidies | Improves affordability but high risks may still face large premiums | • Reduction in incentive for consumers to shop around for the lowest premium<br>• Over-insurance resulting in additional moral hazard<br>• Misallocation of subsidies as all causes of premium variation are subsidised | No incentive for selection if insurers charge risk-rated premiums |
| Premium-rate restrictions (for example, community rating) | Can significantly improve affordability particularly with community rating but competition in plan design may offset this to some degree | Low-risk consumers who are risk averse may be priced out of the market by premiums which are too actuarially unfair | Strong incentives for selection as different risk groups will have predictable losses and profits, in turn inducing instability in the insurance market |
| Excess-loss compensation | Can improve affordability if third party (for example, government) pays a subsidy directly into the Subsidy Fund | Can reduce incentives for efficiency if insurers with high costs due to inefficiency rather than the mix of risks are 'rewarded' | Reduces selection incentives for insurers if excess losses are not over-compensated |

# Subsidising private health insurance in Australia: How to proceed?

How might Australia change the design of the public/private mix in health financing to address the problems identified with the current arrangements and implement a system of risk-adjusted subsidies for PHI? This section outlines a series of reforms which, taken together, would achieve this goal. These include eliminating duplicate coverage by allowing 'opting out' of Medicare, the role of risk-adjusted subsidies, regulation, and the administrative machinery under this option.

## Eliminating duplicate coverage by allowing opting out with risk-adjusted subsidies

In reviewing healthcare financing arrangements in Australia, this paper has argued that, although there are various economic and country-specific arguments for subsidising PHI, the present design of the system leads to duplicate coverage by private and public hospital insurance. This duplication arises because, whether PHI is purchased or not, full cover under the public scheme is retained. Individuals who purchase PHI are therefore insured twice against the cost of a hospital episode. At the point of use, treatment will be obtained in either a private hospital or a public hospital, but not both. Consequently, for any particular episode of hospitalisation, only one of the two insurance policies will be used to cover the cost of the hospital component of their treatment.[19] Duplication arises because the individual cannot transfer their entitlement under either insurance policy to the other. For example, a person with PHI who received treatment in a private hospital cannot transfer the cost of the episode that they otherwise would have had in a public hospital to offset against the cost of the private hospital episode. This structure is likely to be inefficient because, as neatly stated by Ergas (2008, emphasis in original), all contribute to a public pool and have access to public provision; however, the insured are not able to shift the avoided cost of their public use over to private use. Hence, if they want to use private facilities, they face the full cost of these, rather than 'full cost *minus* avoided cost to public sector of displaced use'. Removing this duplication in coverage requires that either the role of PHI be reduced to a purely supplemental role, or it be increased so as to be fully substitutable for public health insurance. In considering the latter option in this paper, it is important to note that the

19 The 'hospital component' here refers to the charges levied by the hospital, as distinct from the charges levied by the doctor. For private patients with PHI, coverage of charges levied by doctors is split between private and public health insurance according to whether the policy is a 'no gap' or 'known gap' policy or a 'no agreement' policy. Under the first two, PHI will cover some or all of the gap between the public insurance (Medicare) rebate for the doctor's service and the fee charged.

30–40 per cent subsidy does provide some redress for the duplication problem. However, it fails to solve the problem because the subsidy is less than 100 per cent *and* full coverage under Medicare is compulsorily retained. This suggests that an 'opt-out' option with full portability of a 100 per cent subsidy between private and public insurers will remove the duplication — individuals would be covered by either PHI or Medicare but not both, and would contribute to only one insurer. Universal coverage would be maintained as health insurance would be compulsory, but individuals would have a choice of public or private insurer (that is, 'Medicare/PHI choice').

Following on from the argument outlined earlier, the subsidy to be received by an individual choosing to opt out of Medicare would be risk-adjusted. Under the opt-out option, it would be set at the expected value of publicly funded health expenditures over the relevant time period (for example, the next year), for all services deemed to be covered by the scheme. For illustrative purposes, Figure 1 shows a set of risk-adjusted annual subsidies for PHI using relative per-capita benefits paid by private health insurers by five-year age groups as the risk adjusters. These weights are applied to the mean per-capita publicly funded health expenditure on all hospitals, medical services and drugs in Australia in 2006–07 ($2273). The subsidies range from a few hundred dollars for children, up to nearly $11 000 for the elderly. The illustrative subsidies in Figure 1 adjust risk for age only, and variation in age captures only a part of the variation in health expenditures between individuals. As van de Ven and Ellis (2000: 759) point out: '… risk-adjusted premiums can easily differ by a factor of ten or more for demographic risk factors such as age, and factors of 100 or more once health status is also taken into account.' Even adjusting only for age, the ratio of the highest to the lowest risk-adjusted subsidy in Figure 1 is 50:1.

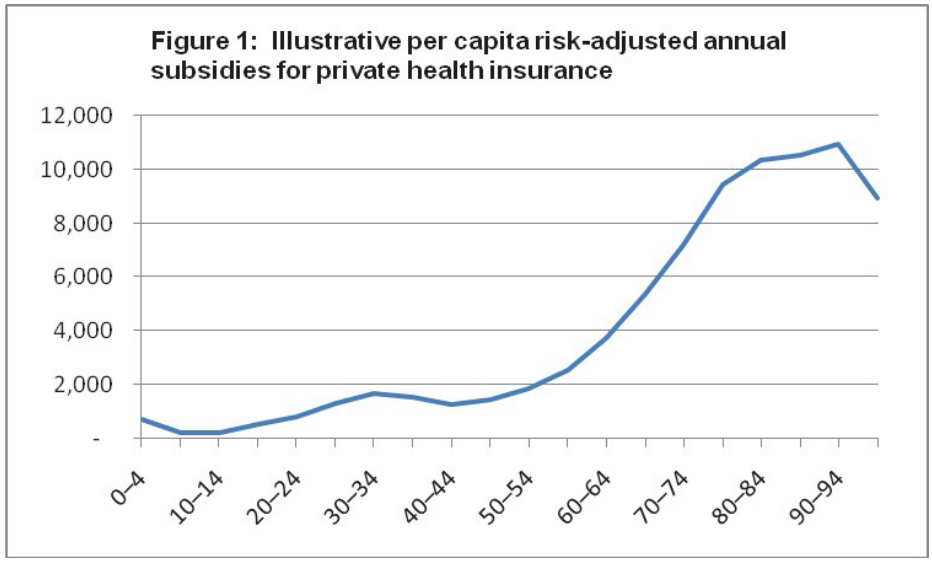

Table 3 provides a calculation of illustrative risk-adjusted subsidies for PHI.

**Table 3: Calculation of illustrative risk-adjusted subsidies for PHI in Australia**

| Age group | Total benefits paid ($) (1) | No of persons covered (2) | Per capita benefits paid ($) (3) | Per capita benefits paid relative to mean (4) | Risk-adjusted subsidy (5) |
|---|---|---|---|---|---|
| 0–4 | 36,750,305 | 545,920 | 37 | 0.32 | 71 |
| 5–9 | 10,540,186 | 557,469 | 19 | 0.09 | 205 |
| 10-14 | 12,355,770 | 593,684 | 21 | 0.10 | 226 |
| 15-19 | 31,993,156 | 635,297 | 50 | 0.24 | 547 |
| 20-24 | 36,889,257 | 494,799 | 75 | 0.36 | 809 |
| 25-29 | 55,585,980 | 468,160 | 119 | 0.57 | 1,289 |
| 30-34 | 96,111,573 | 623,034 | 154 | 0.74 | 1,675 |
| 35-39 | 101,927,593 | 723,309 | 141 | 0.67 | 1,530 |
| 40-44 | 81,374,180 | 708,284 | 115 | 0.55 | 1,247 |
| 45-49 | 101,873,198 | 778,804 | 131 | 0.62 | 1,420 |
| 50-54 | 130,675,822 | 762,717 | 171 | 0.82 | 1,860 |
| 55-59 | 172,682,646 | 733,975 | 235 | 1.12 | 2,554 |
| 60-64 | 216,952,205 | 631,510 | 344 | 1.64 | 3,729 |
| 65-69 | 211,786,434 | 428,562 | 494 | 2.36 | 5,365 |
| 70-74 | 205,785,067 | 311,185 | 661 | 3.16 | 7,179 |
| 75-79 | 215,479,511 | 248,302 | 868 | 4.14 | 9,421 |
| 80-84 | 161,897,549 | 169,922 | 953 | 4.55 | 10,343 |
| 85-89 | 77,541,318 | 79,771 | 972 | 4.64 | 10,552 |
| 90-94 | 31,163,102 | 30,893 | 1009 | 4.82 | 10,950 |
| 95 + | 6,916,468 | 8,382 | 825 | 3.94 | 8,958 |
| All age groups | 1,996,281,322 | 9,533,979 | 209 | | |

Column (1) is the total benefits paid by registered private health funds in Australia for hospital treatment, and medical services and prostheses associated with hospital treatment, in the June Quarter 2008 (PHIAC 2008b, Part 3).

Column (2) is the number of persons covered by PHI in Australia in the June Quarter 2008 (PHIAC 2008a).

Column (3) = column (1) ÷ column (2).

Column (4) = column (3) ÷ mean per capita benefits paid across all age groups ($209).

Column (5) is column (4) multipied by $2,273 which is the per capita publicly funded health expenditure on all hospitals, medical services and drugs in 2006-07 (AIHW 2008, Tables A3, I2).

In return for the risk-adjusted subsidy, insurers would have to cover *all* healthcare expenses of their insured, including services provided to patients in a public hospital. Both public and private hospitals would charge fees for patients with PHI, those fees being covered by the insurer.

## Regulation

If the risk-adjusted subsidies accounted for most of the variation in expected health expenditures between individuals, premium-rate restrictions on private health insurers would be unnecessary as there would be little or no basis for insurers to charge different net premiums to different individuals. However, to the extent that risk adjustment in the subsidies is less than perfect, an incentive exists for insurers to improve upon the degree of risk differentiation by finding additional risk adjusters to use in premium setting. While community rating might not be necessary to remove this incentive, a rate-banding regulation may be needed to constrain the differentiation in net premiums within socially acceptable bounds.[20] Regulation would be required to enforce a minimum benefits package, or basic package, that must be available from every insurer. This would be necessary to prevent insurers carving out various services and including them only in supplementary packages that would then be sold for an additional premium. If the reforms suggested here were to be adopted, it is envisaged that the open-enrolment requirement would be retained for the basic package. However, the risk-adjusted subsidies should reduce the need for insurers to require reinsurance against the exogenous risk of having a poor risk profile. Hence, in contrast to the existing system, no reinsurance or claims-equalisation system would be needed. For supplementary packages, open enrolment would not be required and insurers would be allowed to risk-rate premiums for these packages. The outcome under this market arrangement would need to be monitored for, as Enthoven and van de Ven (2007: 2423) warn, '… the existence of supplemental insurance with risk rating and without open enrolment may leave too large an opportunity for insurers to profit from risk selection', both in the basic and supplementary health insurance markets.[21]

## Administrative machinery

A regulatory body such as the Private Health Insurance Administration Council (PHIAC) would be necessary to enforce the regulations imposed on insurers and also undertake a prudential regulation role. PHIAC may also act

20 It is interesting to note that in the recent Dutch reforms, which incorporate risk-adjusted premiums and require all individuals to purchase their health insurance from a private health insurer, a community-rating regulation continues to be imposed. See Enthoven and van de Ven (2007).

21 See Paolucci *et al*. (2007) for an analysis of supplementary health insurance as a tool for risk selection in mandatory basic health insurance markets in five European countries.

as the administrative body responsible for implementing and refining the risk-adjustment formula, and managing the transfer of risk-adjusted subsidies across insurers of an individual's choice, given its experience with administering and managing the reinsurance (that is, so-called risk equalisation) scheme. Given its role in the current provision of the 30–40 per cent subsidy to PHI, Medicare Australia could also be an alternative administrative body. The private health insurance ombudsman would be retained and continue to perform the same role as under the present scheme.

## Conclusion and discussion

The current public/private mix in healthcare financing in Australia appears to leave unsolved several problems such as over-insurance, high transaction costs, cost-shifting and perverse incentives with respect to waiting times. It also does not seem to be able to achieve a number of policy goals such as to decrease the financial pressure on the public scheme and to increase the affordability and fairness in access to healthcare services for everyone. The main source of these problems can be attributed to the large extent of duplication between public (Medicare) and private (PHI) financing of healthcare services.

In this paper we propose to introduce consumers' choice of health plan, according to which public (Medicare) and private insurers compete with each other and act as the prudent buyer of care. In this paper, we focus on the latter. This proposal is inspired by the arguments of Scotton (1990, 1995) for 'Transferable Medicare entitlements', and is reflected in the proposal made by the National Health and Hospital Reform Commission final report (NHHRC 2009) labelled 'Medicare Select'.[22] The crucial element of this option compared to the current design of healthcare financing is that it removes duplication of coverage by allowing individuals to choose to either be enrolled with Medicare or to opt out of it. As previously discussed, an important component within the context of this option is to introduce an *ex-ante* risk-equalisation scheme to substitute for the 30–40 per cent premium rebate and the *ex-post* claims-equalisation scheme. The risk-based capitation proposal put forward in 2003 provides a basis for the design of the *ex-ante* risk-equalisation scheme. In short, risk-based capitation advocates the introduction of an age–gender risk-adjustment formula similar to the Irish model prior to July 2007 (Gale 2007; Paolucci 2008; Armstrong and Paolucci 2009; Paolucci and Shmueli 2011). Such a proposal could be taken forward and improved by introducing sophisticated risk-adjustment models that implement risk factors like Diagnostic Cost Groups (DCGs) and Pharmaceutical

22 A description and discussion of 'Medicare Select' can be found in Hall (2010), and an economic appraisal of a potential pathway for its implementation in Australia in Ergas *et al*. (2010).

Cost Groups (PCGs), which have proven in other countries (The Netherlands, for example) to be accurate predictors of health status (van de Ven *et al*. 2007). The claims-equalisation scheme could be redesigned to function purely as an excess-loss compensation scheme complementary to the best available risk-equalisation scheme (that is, above a certain threshold, $50 000) but this would depend on the type of services included in the basic package (for example, yes/no long-term care).

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# The Introduction of Ex-ante Risk Equalisation in the Australian Private Health Insurance Market: A First Step

Francesco Paolucci and Amir Shmueli[1]

## Abstract

*In April 2007, the 'Reinsurance' arrangements in place since 1956 were replaced by a 'Risk Equalisation' scheme in the Australian private health insurance market. However, the new arrangements maintained a de facto ex-post (retrospective) claims-equalisation scheme. Equalisation transfers across competing health insurers could instead be achieved by means of a system of ex-ante prospective risk-adjusted subsidies with higher incentives for efficiency and lower incentives for selection compared to ex-post claims equalisation. This paper examines the option of introducing demographic scales for ex-ante (prospective) risk equalisation and its implications on the actual financial transfers (that is, risk-adjusted subsidies flows) across funds. The findings of this paper serve as an information basis for future policies aiming at improving efficiency and preventing selection in the Australian private health insurance market.*

## Introduction

The main problems with Australia's 'risk-equalisation' scheme (effectively an *ex-post*, or retrospective, claims-equalisation scheme) is the absence of incentives for efficiency, conjoined with the presence of incentives for selection in the Australian competitive market for private health insurance (PHI). A similar level of transfers across insurers could be achieved, with higher incentives for

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efficiency and lower incentives for selection, by replacing the current claims equalisation (CE) scheme with a system of *ex-ante* (prospective) risk-adjusted subsidies (that is, risk-equalisation (RE) scheme) or payments across insurers. In fact, most countries (Belgium, Israel, the Netherlands, etc.) which have introduced a centralised-finance/decentralised-delivery health system have based their 'risk-equalisation' scheme on prospective risk-adjusted subsidies supplemented, if at all, by retrospective risk-sharing arrangements (van de Ven *et al*. 2007; van de Ven *et al*. 2003; van Barneveld *et al*. 2001).

In this paper, the key research questions can be summarised as follows:

1. How to construct an *ex-ante* risk-equalisation scheme in the absence of available insurers' individual claims data?
2. What are the consequences in terms of inter-funds RE transfers (that is, risk-adjusted cross-subsidies) of modifying the current *ex-post* retrospective age-based CE into an *ex-ante* prospective demographic (that is, age/gender) RE scheme within the Australia PHI market?[2]

Section 2 provides an overview of how the Australian private health insurance market is currently regulated and examines the case for *ex-ante* risk equalisation as an alternative to the current *ex-post* CE scheme. The data and the methods adopted in our analysis are discussed in sections 3 and 4. Section 5 presents the results of several demographic scales for an *ex-ante* (prospective) risk-equalisation scheme and the implications of a transition from an age-based CE to an age/gender-based RE on the inter-funds subsidies flows (that is, financial transfers). The conclusions and the policy implications are summarised in section 6.

# The case for prospective risk equalisation in the Australian private health insurance market

## Regulations and subsidies in the Australian PHI

For many years following the introduction of Medicare in 1984, the proportion of PHI holders diminished from about 50 per cent to about 30 per cent in 1997, with increasing evidence of a regulation-induced selection spiral driven by community-rating with open enrolment regulations (Butler 2007; Connelly and Brown 2006; Lu and Savage 2006; Brown and Connelly 2005; Vaithianathan 2004; Butler 2003 and 2002; Hall 1999). Although the aim of community-rating

2 Demographic scales for prospective RE represent the first step towards the implementation of morbidity-based *ex-ante* risk equalisation (van de Ven and Ellis 2000).

(with open enrolment) has been to implement cross-subsidies between low- and high-risk groups, it obviously creates incentives for risk-selection. In addition, community-rating (with open enrolment) does not adequately address adverse-selection problems in competitive markets for voluntary health insurance (like the Australian PHI market) (van de Ven and Ellis 2000; Schut 1995).

Since 1997, the government has intervened in the Australian competitive market for PHI by introducing several forms of explicit subsidies with the aim of providing incentives to (low-risk) consumers to buy PHI and to support community-rating. Explicit subsidies include the 30–35–40 per cent premium rebate (that is, premium-related subsidy) to individuals who purchase PHI; a tax penalty of 1 per cent of taxable income payable by single individuals with taxable incomes in excess of $70 000 p.a. ($140 000 p.a. for couples) if they do not hold PHI (that is, the Medicare levy surcharge); and an *ex-post* (retrospective) CE scheme (that is, since 1956 referred to as reinsurance, renamed risk-equalisation in 2007). While collectively these measures finally stabilised PHI coverage at around 43% of the population since 2005, they are not optimal as they lead to the trade-offs between affordability, efficiency and selection (van de Ven and Schut 2007; Paolucci *et al*. 2006; van de Ven and Ellis 2000; van de Ven *et al*. 2000). As pointed out by van de Ven and Schut (2007), the only escape from these trade-offs is *ex-ante* (prospective) risk-equalisation. To the extent that some high-risk individuals are insufficiently subsidised, the *ex-ante* risk-equalisation payments can be complemented by one or more of the above-mentioned forms of subsidy: premium-based subsidies, *ex-post* claims-equalisation and implicit cross-subsidies enforced by premium-rate restrictions for a specified insurance coverage. The better the subsidies are adjusted for relevant risk factors, the less these complementary strategies are needed, and the less severe is the trade-off (van de Ven and Schut 2007; Paolucci *et al*. 2006).

## The risk-equalisation scheme since 2007[3]

In April 2007, the reinsurance scheme introduced in 1956 was replaced by a risk-equalisation scheme. The reinsurance scheme in place until 2007 functioned as an *ex-post* claims-sharing arrangement (that is, claims equalisation) among insurers. In particular, equalisation of funds was based on 79 per cent of insurers' hospital claims costs for individuals aged over 65 and for all members (including those younger than 65) with more than 35 days in hospital during the year. The Private Health Insurance Administration Council (that is, the regulator/sponsor) received quarterly information from the health funds, calculated an average claims cost for each State[4] and calculated an average claims cost for

3 For a detailed overview of the previous reinsurance and current risk-equalisation schemes in Australia, we refer to Connelly *et al*. 2010, Armstrong *et al*. 2010, and Armstrong and Paolucci 2010).

4 Note that the Australian Capital Territory is included in New South Wales.

each fund operating in each of those States. Where funds had higher than the average claims, they received money from the reinsurance pool, and where they had lower than the State average, they paid money into the pool. The pool is a quarterly zero-sum calculation.

Although the so-called risk-equalisation scheme has replaced and modified the reinsurance scheme in many ways (see below), *de facto* it maintained the features of an *ex-post* (retrospective) claims-equalisation (CE) rather than an *ex-ante* (prospective) risk-equalisation (RE) scheme. The current CE is 'a system to share the hospital costs and some general treatment costs of high risk groups among private health insurers', with the purpose of allowing 'a more equitable treatment of health funds with different coverage of high-risk groups to support community rating' (PHIAC 2007). First the Age-Based Pool (ABP) has been introduced with the purpose of matching more closely the increase in claims by age and, in particular, it replaces the two age-bands (+/- 65 years old) of the reinsurance scheme with a set of eight age groups with varying proportions of the claims cost increasing with the age of the claimant (see Table 1).

**Table 1: From the 'old two age-bands system' to the 'new ABP'**

| Age | % of claims-costs pooled under 'Reinsurance' | % of claims-costs pooled under 'Risk-equalisation' |
|---|---|---|
| 0–54 | 0% | 0% |
| 55–59 | 0% | 15% |
| 60–64 | 0% | 43% |
| 65–69 | 79% | 60% |
| 70–74 | 79% | 70% |
| 75–79 | 79% | 76% |
| 80–84 | 79% | 78% |
| 85–89 | 79% | 82% |
| 90–94 | 79% | 82% |
| 95+ | 79% | 82% |

The pooling of claims costs for all individuals with hospitalisation in excess of 35 days in a 12-month period was replaced by a High Cost Claims Pool (HCCP), where benefits in excess of $50 000 in a 12-month period are pooled (after the operation of the age-based pooling). In practice, the HCCP shares the costs of high-cost claimants where they are not otherwise shared by the ABP. The HCCP was implemented to protect small funds from large claims in lieu of genuine excess-loss compensation schemes (van de Ven and Schut 2007; Paolucci *et al*. 2006). Risk equalisation transfers about $50 million per quarter among the health funds. PHIAC expects this to grow as the insured population continues to age (PHIAC 2007).

The old reinsurance scheme only included hospital costs, whereas from 2007 these costs are eligible for pooling within the *ex-post* (retrospective) CE scheme: hospital benefits, hospital substitute benefits, chronic-disease management program benefits, and high-cost claimants' benefits *(Division 69, Private Health Insurance Act 2007)*.

## The construction and operation of ex-ante risk equalisation

The construction of *ex-ante* prospective RE scheme by the regulator consists of three parts:

(a) the choice of risk adjusters; namely, the characteristics of the enrolees and of the insurers which best predict future healthcare expenditures. This choice is shaped by statistical considerations, data availability, social norms regarding responsibility (for example, smoking) and discrimination/affirmative action (such as minorities' health), and the need to minimise the information asymmetry between the insurers and the regulator.

(b) the creation of optimal cost groups; namely, where the variance in cost between groups is maximised and variance within groups is minimised.

(c) setting the prospective capitation rates (relative-risk scale) for the (exhausting and mutually exclusive) groups defined by the set of the risk adjusters chosen.

Ideally, the set of risk adjusters includes socio-demographic and health status characteristics of the enrolees, which are risk factors likely to be used by insurers for risk selection or to risk-rate premiums in the PHI market,[5] modified, maybe, by public health considerations. In reality, this set is unknown to the regulator, and the risk-based grouping of the population for the calculation of the risk-adjusted subsidies depends on the availability of data, the statistical skills and the sophistication of the regulator. In most countries, the set of risk adjusters adopted by the regulators includes demographic characteristics (such as age and gender), and in some countries health status indicators (for example, Diagnostic Cost Groups and Pharmaceuticals Cost Groups in the Netherlands). The prospective rates are ideally calculated from actual costs of a representative sample of the enrolees as reported by the insurers using individual claims data. At least during the first years after the introduction of a risk-equalisation scheme, the insurers' individual claims data are not readily available in most countries — either because of technical and IT difficulties or because of the

5 Although premium rate restrictions (i.e. community-rating per product per insurer) have been applying already for a long time as a regulatory tool to prevent insurers from risk-rating in the Australian private health insurance market, there is anecdotal evidence of premium differentiation via product differentiation (Paolucci 2008).

insurers' reluctance to provide commercial data. In such cases, other sources reporting on healthcare utilisation by the population together with individual characteristics can be used.

The introduction of *ex-ante* (prospective) risk equalisation and the improvement of the current formula by adding to age other sensitive risk factors such as gender (that is, a demographic model), even without using insurers' individual claims data, would be largely beneficial in terms of reducing insurers' incentives for risk selection and would, overall, increase efficiency and affordability compared to the current *ex-post* (retrospective) risk equalisation. *Ex-ante* risk equalisation is based on the notion of a 'standardised person'. Demographic scales (that is, age/sex) can be derived, first, by calculating the age–/ex-specific means ('the cell method') of the measure of cost (utilisation), and then by dividing them by the overall mean. The 'standardised person' (SP) is the average which is indicated by 1 (SPs). The scale values indicate to how many SPs every person is equivalent, according to her age and sex. This approach is convenient for policy purposes, since it separates between the size of the budget and the budget ('voucher') per SP, on the one hand, and the risk-adjusted allocation of the budget among the insurers, on the other. In some cases, 'total medical care costs' are unavailable, while the available data include utilisation of specific services (for example, visits to the dentist, to GPs, inpatient hospital nights, and so on).

An overall scale is calculated in the following way. Suppose there are two health services covered by PHI — hospitalisations and GP visits. Denote the unit cost of an inpatient day by $p_s$ and the unit cost of a visit to a GP by $p_b$. If the yearly mean number of hospitalisation days in the risk-equalisation group i is $s_i$ and the mean number of visits to GPs is $b_i$ , the mean total cost in group i is given by $c_i=p_s s_i+p_b b_i$. Similarly, the grand mean cost in the population is $c=p_s s+p_b b$, where s and b are the mean yearly hospitalisation days and visits to GPs in the population. The total relative scale is:

$$c_i/c = (p_s\, s_i+p_b\, b_i)/\,(p_s\, s+p_b\, b) = v_s\,(s_i/s) + v_b\,(b_i/b)$$

$$\text{where } v_s = \; p_s\, s/(p_s\, s+p_b\, b) \text{ and } v_b = p_b\, b\,/(p_s\, s+p_b\, b).$$

In other words, the scale is a weighted average of the service-specific scales in physical quantities, with the weights being the relative share of the cost of the service in total cost. The total budget for allocation among insurers is predetermined according to society's priorities and definition of acceptable costs (that is, costs to be reimbursed, Schokkaert *et al*. 2006), and is allocated among insurers according to the insurers' shares in total standardised persons. According to the Australian *ex-post* claims-equalisation scheme, a certain percentage of the claims (the percentage is increasing with age) is virtually collected into the Risk Equalisation Trust Fund (REF), and then allocated to the

insurers according to their market shares. The fundamental difference between *ex-ante* risk equalisation and *ex-post* claims equalisation (that is, the current Australian RE scheme) is that in *ex-ante* risk equalisation the total budget is set *a priori* according to society's priorities, and is allocated to the insurers according (and only) to the age (and potentially other predetermined risk-factors) structure of their populations. *Ex-post* claims equalisation re-distributes a 'budget' set exogenously, mainly made of the age-based contributions of all insurers, which are derived from the *actual* claims (costs) according to market share. The age structure of the populations determines the contribution rather than the transfer. The percentage contributions define quite arbitrarily the socially 'acceptable costs' out of total costs (benefit paid) which flow in the pool to be re-distributed across funds.

## Data

Since insurers' individual-claims data are not publicly available and individual records on the use of public healthcare are segmented between Medicare, the States and the Commonwealth, preventing linkage on the individual level in the near future, risk equalisation in Australia can at present be based only on scales derived from available breakdowns of the utilisation of health services and benefits by State, age and sex. While it is agreed that demographic scales are not sufficient to remove the incentives for selection (van de Ven and Ellis 2000), international experience shows that for reasons related to data availability and social and political acceptance, the implementation of a new *ex-ante* risk-equalisation scheme should begin with (socio-) demographic scales (van de Ven *et al*. 2003). After the accumulation of some experience and the development of IT and individual level databases, one can search for sophisticated health-based scales (Stam *et al*. 2010).

In the following sections, we derive the demographic scales of an *ex-ante* RE system based on three public data sources (PHIAC 2007; AIHW 2006–07; and the NHS 2004–05) with the purpose of selecting the 'preferred' scales to adopt in further elaborations of the current risk-equalisation scheme in Australia. While the AIHW and the NHS data refer to the entire Australian population, PHIAC data refer to the insured population (about 45 per cent of the Australian population voluntarily chooses to purchase PHI).[6] Although the most relevant population for the purposes of risk equalisation among insurers is represented by PHI holders, it is also subject to changes in insurance ownership patterns over

6 PHIAC 2007, 2008.

time, and therefore the derived scales would need to be verified and updated often. Since at present CE is done by State, we present the scales by State as well. The NHS data, however, are too small to derive State-specific scales.

To simulate the implications of replacing the current *ex-post* (retrospective) age-based CE scheme with an *ex-ante* (prospective) RE scheme on the financial transfers across funds (that is, inter-funds risk-adjusted subsidies payments based on age and gender), we use PHIAC aggregate data (2007) on health insurers' actual benefits (that is, claims costs).[7]

# Risk equalisation scales in Australia using publicly available data

## Scales derived from PHIAC data

The data available from PHIAC include the number of hospital days, episodes (separations), fees and benefits, and the number of services used, fees and benefits for the general treatment policies. For the overall scale we used the sum of benefits for hospitals and treatments policies.[8] We used the number of hospital policy owners (9.4 million) as the relevant population size.

Figure 1 presents the four hospitalisation scales for men and women.

Up to age 75, all the scales are approximately similar. Above age 75, the scales based on days in hospital increase rapidly, while the scale based on episodes stabilises on 4 among men and 2.5 among women. The fees and benefits scales are in between. We note that if inpatient care is paid for by prospective per-case methods (DRG), the benefits should follow closely the episodes scale. If reimbursement is based on per-diem, the benefits should follow the day-scale. A possible explanation for the gap is that 'days' include long-term hospitalisation which is not covered, or is covered only partially, by the private insurers.

7 Most insurers (30 out of 39) formally authorised PHIAC to allow us to access aggregate ( age-gender groups) health expenditures data per insurer for hospital care and general treatment services. The remaining nine insurers were treated as one insurer to cover the entire market.

8 Doing so, we introduced a slight inaccuracy to the calculation, since the owners of hospitals policies and of general treatments policies do not match exactly. Data on ownership of each type of policy by age and sex and state are not available, but using total population data from 2007 indicates that the inaccuracy is small: out of 10.8 million insured, 9.0 million have both policies, 0.4 million own hospital policy only, and 1.4 million persons own general treatments only.

**Figure 1A: PHIAC hospitalisation scales: Men (1=mean)**

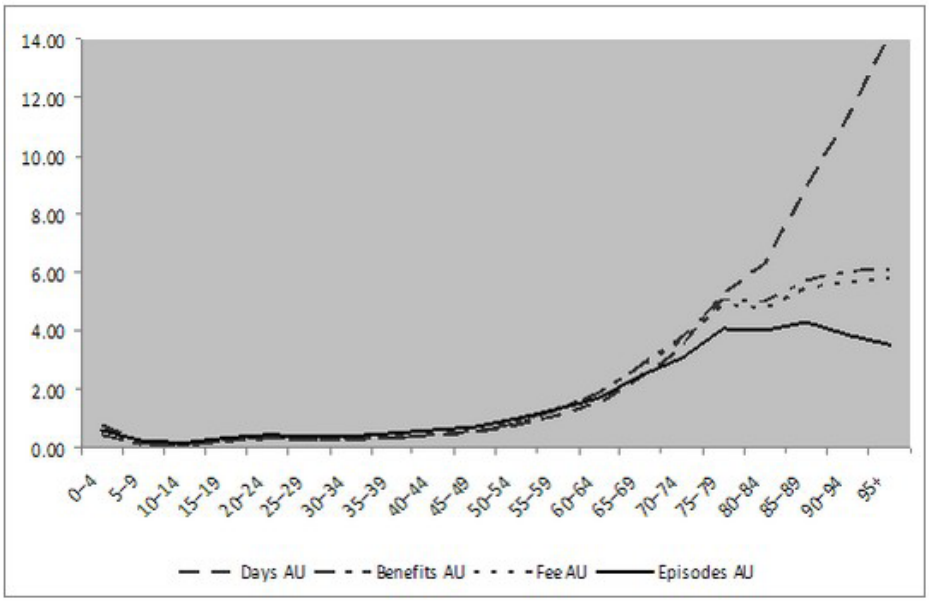



**Figure 1B: PHIAC hospitalisation scales: Women (1=mean)**

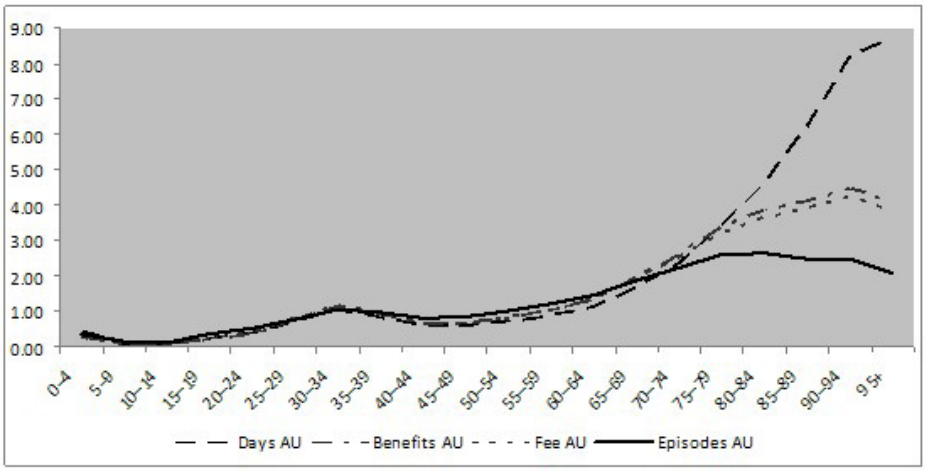


**Figure 2A: PHIAC general treatments scales: Men (1=mean)**

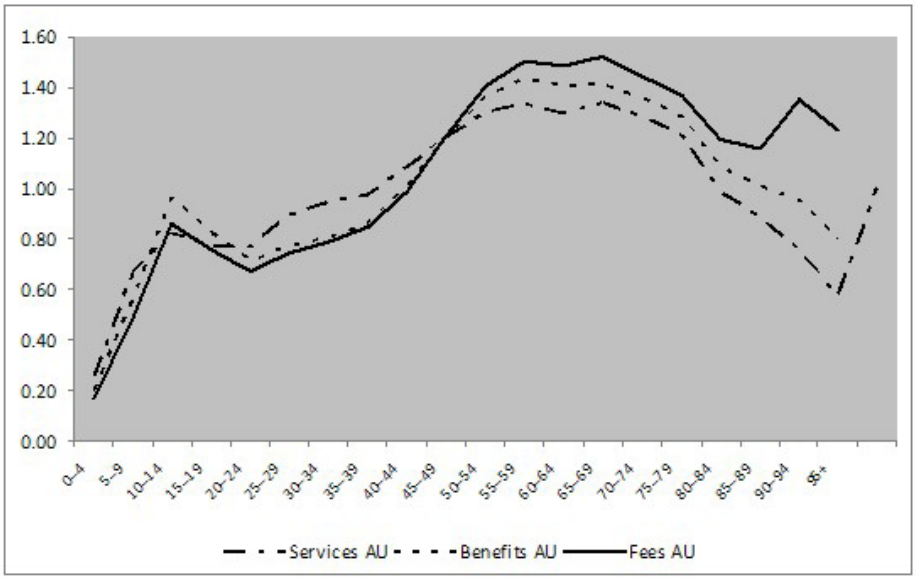



**Figure 2B: PHIAC general treatments scales – Women (1=mean)**

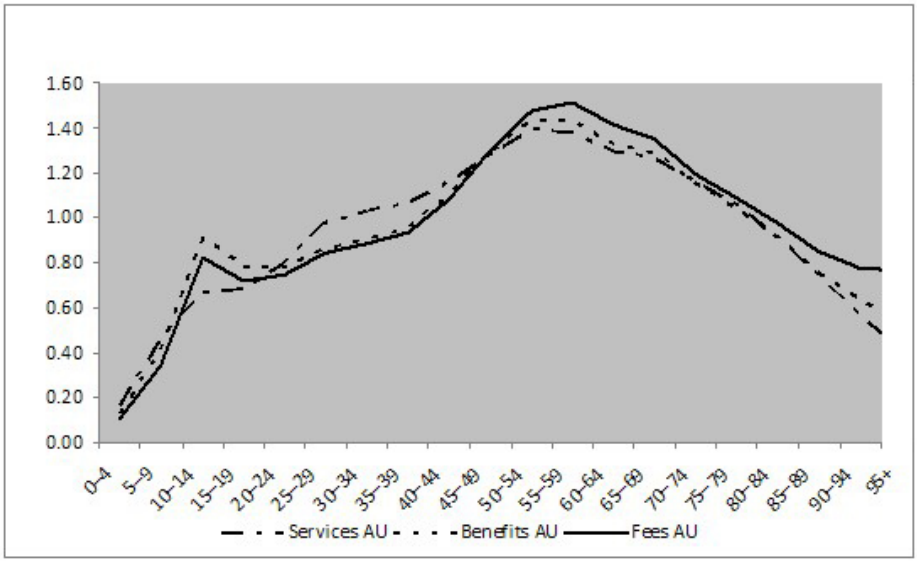


Figure 2 presents the three general treatments scales: number of services (episodes), benefits and fees.

The scales are quite similar below age 80, particularly for women. The higher scale for fees indicates the relatively higher co-payments paid by elderly persons. We chose to focus subsequently on the benefits scale.

## Scales derived from NHS 2004–05 data

Although suffering from recall problems and other biases, population surveys on use of services have been used extensively for risk adjustment (Stam *et al*. 2010). The relatively small number of persons prevented the calculation of state-specific scales, and the age groups were enlarged to 10-year intervals. We built service-specific scales for dental care visits, visits to GPs and specialists out of hospitals, in hospital outpatient visits (ER, same-day admissions), and inpatient overnights. In order to combine these into an overall scale, we used cost weights that were obtained from AIHW (2006) and were modified to the services discussed, as indicated in Table 2:

**Table 2: Adapted costs weights (AIHW 2004–05)**

| | |
|---|---|
| Dental care | 9.9% |
| Out-of-hospital services (GPs, specialists, other medical) | 22.6% |
| In-hospital outpatient visits (ER, same-day admissions) | 35.2% |
| Inpatient overnights | 32.3% |
| Total | 100.0% |

Figure 3 presents the scales for men and women separately using weighted data.

**Figure 3A: National Health Survey (2004/05) Service-specific and overall scales: Men (1=mean)**

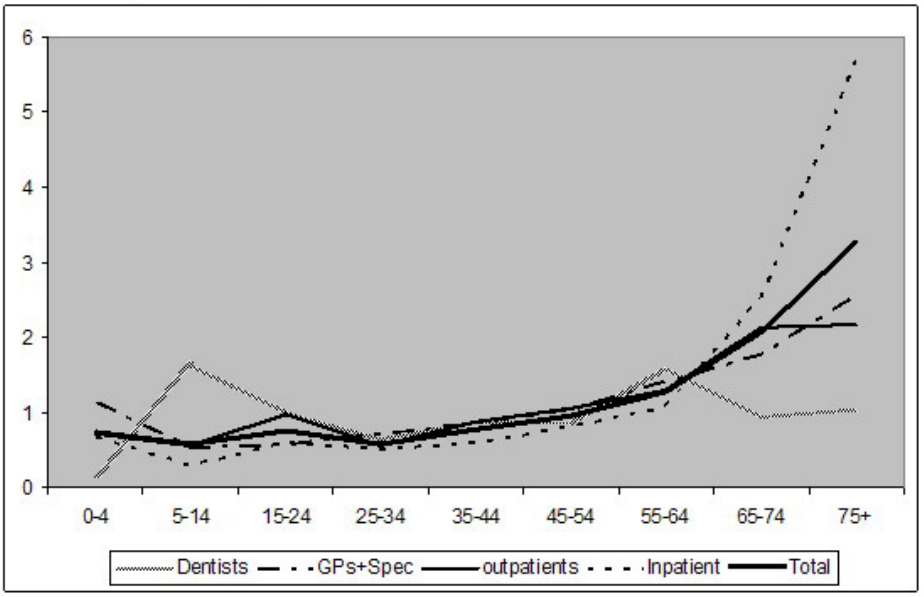
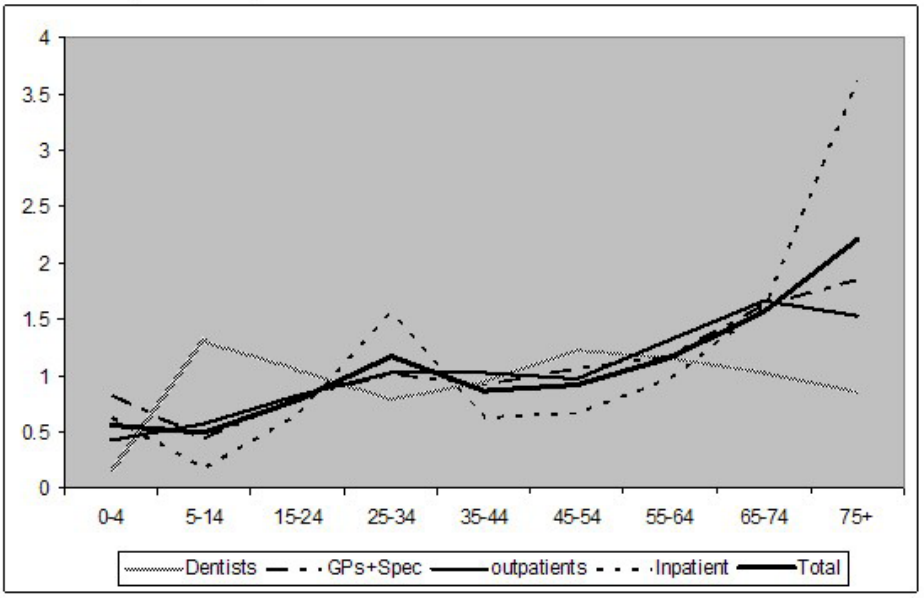



**Figure 3B: National Health Survey (2004/05) Service-specific and overall scales: Women (1=mean)**



### Scales from other sources

Other scales can be derived from AIHW 2006–07 data (that is, hospitalisation scales) and from Medicare-MBS 2005–06 data. The AIHW data include separations (episodes) and days in public and private hospitals by age, sex and state, including one-day admissions. The scales for TAS, ACT and NT include public hospitals only (the AU scales include all hospitalisations, however). The NT scales are unreliable due to small cells and were disregarded. The MBS data include benefits such as medical and surgical care and services, X-rays, laboratory tests, electro-cardiograms, and so on. Unfortunately, the PBS data are not available by age and sex.

## Comparisons: Hospitalisation-days scales and overall scales

Figure 4 brings together the inpatient-days scales calculated from PHIAC, AIHW and NHS. The AIHW and NHS scales were 'stretched' to fit the PHIAC's detailed age groups. Up to age 75, the scales are remarkably close. For some reason, women aged 25–40 in the NHS report more inpatient days. Above age 75, among men, the PHIAC and AIHW scales are quite close, considering the truncation of the AIHW scale. Among women aged 80+, the AIHW scale is much higher than that based on PHIAC data. As discussed previously, the gap might be explained by long-term care days for uninsured women.

Four overall scales emerge: the PHIAC scales, which are based on benefits; the NHS scales, which are based on aggregating service-specific use scales; the MBS-Inpatient Days scales and the MBS-Inpatient Separations scales. The latter two are based on aggregation of the MBS scales with the AIHW inpatient scales of days and separations respectively. The weights used in this aggregation are 65 per cent for inpatient care, and 35 per cent for the MBS care (AIHW, Health expenditure by area of expenditure, 2005–06). Figure 5 presents these scales, together with a fifth overall scale, which is taken from Table 8.10 of Australia Health 2008.

**Figure 4A: Combined inpatient-days scales:Men (1=mean)**

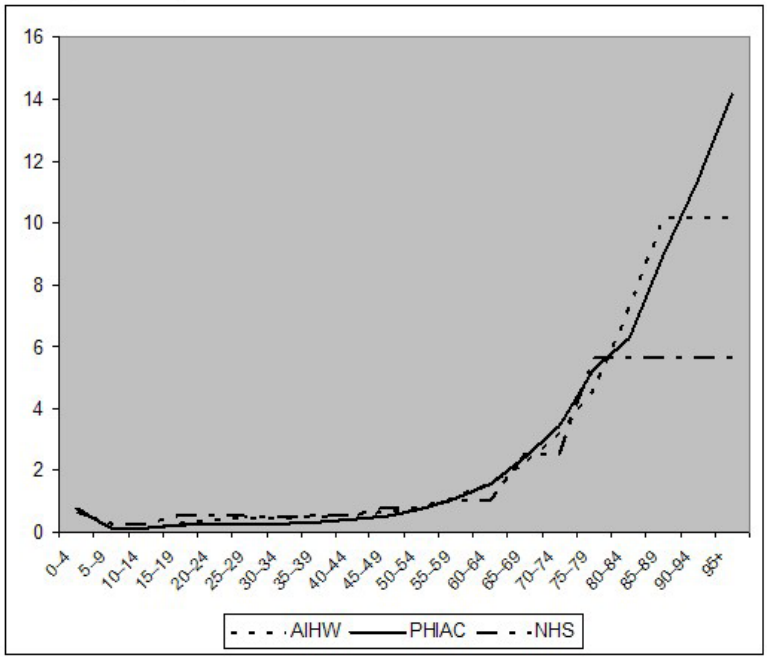



**Figure 4B: Combined inpatient-days scales: Women (1=mean)**

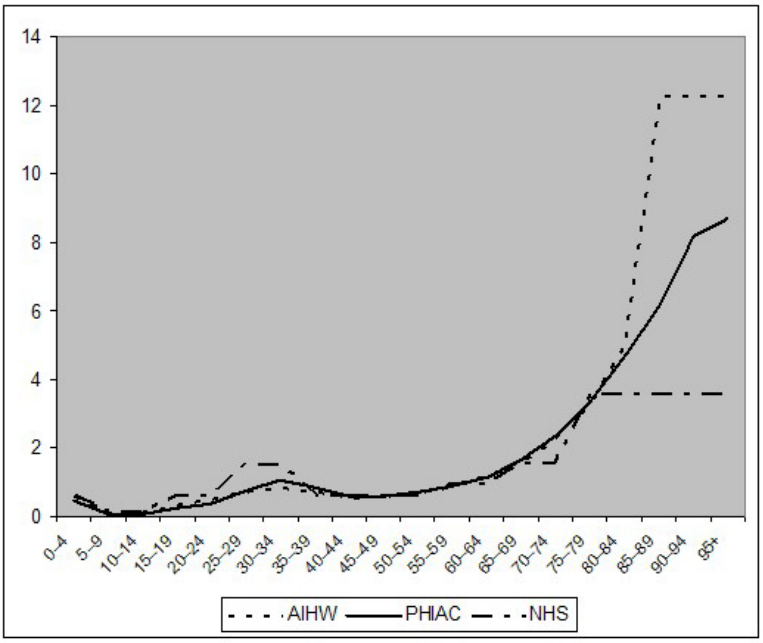


**Figure 5A: Overall scales: Men (1=mean)**

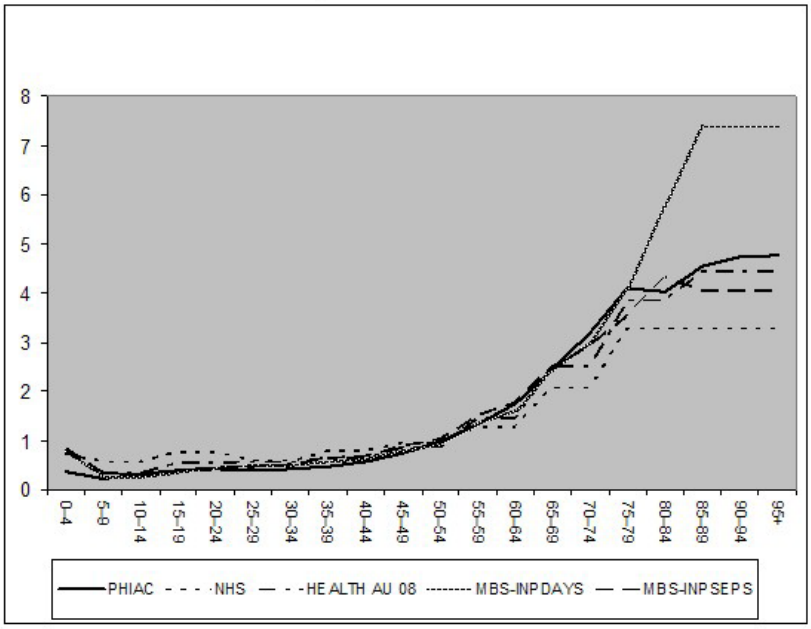
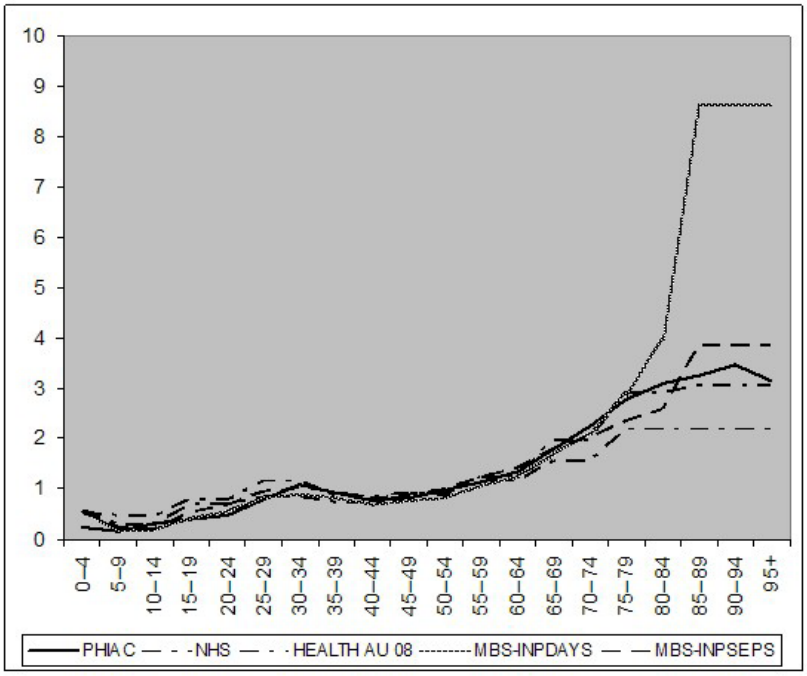



**Figure 5B: Overall scales: Women (1=mean)**



This scale is based on 'allocated expenditures by diseases' that covers about 65 per cent of total health expenditures (excluding hospital non-admitted patient care, community health, public health, administration, other health practitioners, transport, aids and appliances).

Up to age 60, all scales for both men and women are quite close. Above age 60, the NHS scale is considerably below the others. Up to age 75, the four remaining scales are quite similar; but above age 75, the MBS-INPDAYS scale takes off rapidly, while the PHIAC, MBS-INPSEPS and HEALTH AU 08 scales remain close to each other.

The critical question, therefore, is whether inpatient days or inpatient benefits or separations represent more accurately the resources devoted to inpatient care. If it is inpatient days, the MBS-INPDAYS scales should be adopted. Alternatively, either of the two remaining scales (PHIAC or MBS-INPSEPS) is appropriate and can be used as demographic scales for prospective RE in Australia.

## The effects of the introduction of ex-ante risk equalisation on inter-funds transfers

Based on the above overall age-gender scales and the current ABP (age-based pool; that is, RE using age as the only risk factor) allocation of benefits (that is, claims costs), we simulate the effect of moving towards *ex-ante* RE on the benefits share for selected insurers in each State and in Australia as a whole. Specifically, we use the overall scales based on PHIAC data (2007) to calculate the number of standardised persons for each insurer in each State. The post-RE benefits share is the share of standardised persons per insurer on the total of standardised persons in each State and in Australia; and the pre-RE benefits share is the original distribution of benefits across the insurers. The post-RE ABP-based benefit share is the pre-RE benefits share modified by the ABP transfers. The gain or loss for each insurer is the difference between the *ex-ante* RE size of benefits and the benefits resulting from the ABP distribution. We note that the total budget (the sum of the original benefits across insurers) always remains constant.

From Table 3 it is clear that a transition from the current *ex-post* CE to an *ex-ante* RE scheme will result in gainers and losers among insurers. The identity of these gainers and losers differs across States.[9] In total Australia, about two-thirds of the funds would lose from the transition from CE to RE and the financial losses at the fund level would range from -$1.781 ($I_{15}$) — that is, 0.01 per cent of the total budget (= $21.156.000) — to -$548.222 ($I_{18}$) — that is, 2.6 per cent of the total budget (where $I_i$ indexes the identity of insurers operating in the Australian PHI market). The remaining one-third of the funds would gain from the transition and the financial gains would range from $2.823 ($I_{29}$) — 0.013 per cent of the total budget — to $345.725 ($I_{30}$) — 1.63 per cent of the total budget. The main gainers (among the insurers included in this simulation) will be insurers $I_{30}$ (= $345.725), $I_{17}$ (= $321.303) and $I_{14}$ ($92.565). The main losers will be $I_{18}$ (-$548.222), $I_{13}$ (-$137.748) and $I_4$ (-$93.285).

9 For reasons of space we haven't included the transfers at the State level, which might be made available upon request to the authors.

**Table 3: Effect of switching from *ex-post* CE to *ex-ante* RE on inter-funds transfers at the national level in Australia (population and benefits are for 30.6.08, PHIAC data)**

| FID[1] | Pre-RE benefit shares (%)[2] | Post-RE ABP benefit shares (%)[3] | Post-RE Ex-ante benefit shares (%)[4] | Gain/ Loss (000 AU$)*[5] |
|---|---|---|---|---|
| I1 | 0.141 | 0.154 | 0.107 | -10.057 |
| I2 | 0.159 | 0.195 | 0.082 | -24.089 |
| I3 | 1.361 | 1.011 | 1.280 | 56.965 |
| I4 | 3.414 | 3.876 | 3.435 | -93.285 |
| I5 | 0.057 | 0.069 | 0.042 | -5.741 |
| I6 | 0.476 | 0.537 | 0.379 | -33.524 |
| I7 | 0.168 | 0.192 | 0.116 | -16.177 |
| I8 | 1.353 | 1.259 | 1.610 | 74.194 |
| I9 | 0.373 | 0.267 | 0.250 | -3.612 |
| I10 | 0.073 | 0.062 | 0.079 | 3.639 |
| I11 | 0.441 | 0.448 | 0.435 | -2.704 |
| I12 | 0.415 | 0.363 | 0.352 | -2.450 |
| I13 | 16.839 | 17.987 | 17.336 | -137.748 |
| I14 | 27.954 | 28.615 | 29.053 | 92.565 |
| I15 | 1.687 | 1.466 | 1.458 | -1.781 |
| I16 | 0.313 | 0.294 | 0.253 | -8.789 |
| I17 | 5.481 | 4.476 | 5.995 | 321.303 |
| I18 | 10.533 | 10.859 | 8.267 | -548.222 |
| I19 | 1.940 | 1.699 | 1.830 | 27.697 |
| I20 | 0.170 | 0.188 | 0.141 | -10.128 |
| I21 | 0.559 | 0.537 | 0.422 | -24.334 |
| I22 | 0.423 | 0.521 | 0.261 | -54.996 |
| I23 | 0.082 | 0.104 | 0.058 | -9.645 |
| I24 | 0.347 | 0.285 | 0.245 | -8.486 |
| I25 | 1.976 | 1.784 | 1.994 | 44.439 |
| I26 | 0.428 | 0.453 | 0.397 | -11.744 |
| I27 | 0.085 | 0.087 | 0.062 | -5.206 |
| I28 | 0.630 | 0.598 | 0.803 | 43.369 |
| I29 | 0.038 | 0.028 | 0.041 | 2.823 |
| I30 | 22.085 | 21.583 | 23.217 | 345.725 |
| TOTAL | 100.000 | 100.000 | 100.000 | 0.000 |

[1] Funds identity.
[2] Share of claims per fund prior to the operation of the current ex-post claims-equalisation scheme.
[3] Share of claims per fund after the operation of the current ex-post risk-equalisation scheme.
[4] Share of claims per fund after the operation of the new ex-ante risk-equalisation scheme.
[5] Financial gains/losses per fund per quarter resulting from the transition from ex-post to ex-ante.
* PHIAC scale-based benefit share - ABP benefit share.

The 'new' redistribution based on *ex-ante* demographic RE matches the age–gender structure better than under the current *ex-post* CE, reducing the incentives for selection. Considering that according to RE the total benefits are taken as an *ex-ante* budget, incentives for efficiency will also be increased.

## Conclusions

In this paper, we examine several options for an *ex-ante* (prospective) risk-equalisation scheme and its implications on the inter-funds subsidies flows. Since individual claims data are not publicly available, we analyse aggregate age/sex-based scales derived from PHIAC data; and scales derived from the National Health Morbidity Data (AIHW); from Medicare (MBS); and from the National Health Survey (NHS). From these sources we calculate several risk-adjustment demographic scales, to derive the 'preferred' scales to use in further elaborations of the risk-equalisation scheme in Australia. The choice of preferred scale depends on whether inpatient days or inpatient benefits or separations represent more accurately the resources devoted to inpatient care. If it is inpatient days, the preferred scale is MBS-INPDAYS, otherwise either of the two remaining scales (PHIAC or MBS-INPSEPS) is equally appropriate and can be used for a prospective risk-equalisation scheme in Australia.

Although risk equalisation in Australia can be improved at present only using demographic scales derived from publicly available data on the utilisation of health services, it is clear that demographic scales are not sufficient to remove the incentives for risk selection by the insurers (van de Ven and Ellis 2000). The next crucial step is to derive the scales for other potential relevant risk factors, such as health-based scales. These scales could be derived by linking state hospital data and expenditure data with federal medical and pharmaceutical expenditure data at the individual level. For instance, Donato and Richardson (2006) report on an exploratory inquiry into the Australian application of the US version of the diagnostic cost groups (DxCGs) risk-adjustment method to a large Australian hospital inpatient data set (1996–97 and 1997–98) for New South Wales.[10] Their study focuses on the potential usefulness of individual-level risk-adjustment methods for validating measurement of performance across healthcare providers and for allocating resources efficiently and equitably across population groups of different area health services (AHS) in New South Wales. In line with studies performed in other countries, they find that diagnosis-based

10 Although Donato and Richardson (2006) has been the first study on risk adjustment in Australia based on a large hospital data set, previous studies on the topic have been conducted by Duckett and Agius (2002) and Anthioc and Walsh (2004).

risk adjustment offers the potential to refine measures of case-mix adjustment of population groups, providing a more reliable assessment of the efficiency of different AHS (in NSW) compared to age/sex demographic methods.

The combination of inpatient hospital diagnostic information with pharmaceutical and self-assessed health status information has been shown to perform significantly better than demographic and/or inpatient-only models alone (for example, in the Netherlands — see Stam *et al*. 2010).

In particular, the introduction of ex-ante (prospective) risk equalisation and the improvement of the current formula (that is, based on more sensitive risk factors than those currently adopted, such as gender), even without using insurers' individual claims data, would be largely beneficial in terms of reducing insurers' incentives for risk selection and would increase overall efficiency compared to the current *ex-post* (retrospective) CE.

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