Should private medical insurance be subsidised?

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INTRODUCTION

The private health care sector forms a relatively small part of the system of health care in this country, but its importance has grown in recent decades. Compared to the 3.6 million people covered by private medical insurance (PMI) in 1980, there are approximately 6.4 million people covered today, and private-sector health spending accounts for approximately 16 per cent of total health spending. This proportion remains small by international standards, and despite the significant increases in funding allocated to the NHS over the next five years, many commentators have predicted a further increasing role for the private sector as the NHS continues to grapple with ever-increasing demands.

An important question arising from this is whether there should be active encouragement for such growth in the private sector by government. Until recently, the UK tax system contained two subsidies to PMI. The first encouraged those over 60 to take out PMI by providing income tax relief at the basic rate, and the second encouraged employers to provide PMI as a benefit-in-kind to employees, as no employers' National Insurance contributions were payable on this (as well as some other) benefits. Both of these reliefs have been abolished by the current government.

Here we examine the case for the subsidy of PMI. To do this, we first set the context by comparing public and private spending on health care in the UK and other European and G7 countries. We then set out how ownership of PMI has grown over the last four decades, and describe the characteristics of those who currently own PMI. We next consider whether the Government should encourage the take-up of PMI, by addressing firstly, whether there are considerations of equity and 'fairness' which would suggest that PMI should be subsidised. We then go on to consider whether any tax subsidy to PMI is likely to be self-financing. In part, this depends upon how responsive individuals are to changes in the price of PMI. We go on to examine this issue by considering

the effect of the removal of tax relief on PMI to the over-60s announced in the July 1997 Budget. Using a 'difference of difference' approach we are able to estimate the number of people who gave up their insurance policies as a result of this reform, and consider whether the cost of any increase in demand for NHS services resulting from this decline in private coverage was likely to outweigh the estimated £135 million annual cost of the subsidy.

PUBLIC AND PRIVATE SPENDING ON HEALTH

The UK's health care sector, at 6.7 per cent of GDP, takes the smallest share of national income of all the G7 countries. This is shown in Figure 1, which sets out OECD estimates of the share of national income taken by public health spending and private health spending in 1998 for these countries. The US is the biggest health spender amongst this group, with almost 14 per cent of its GDP going to health care. Germany and France also have relatively large health care sectors,

Figure 1: Public and total health expenditure as a percentage of GDP in the G7 countries, 1998
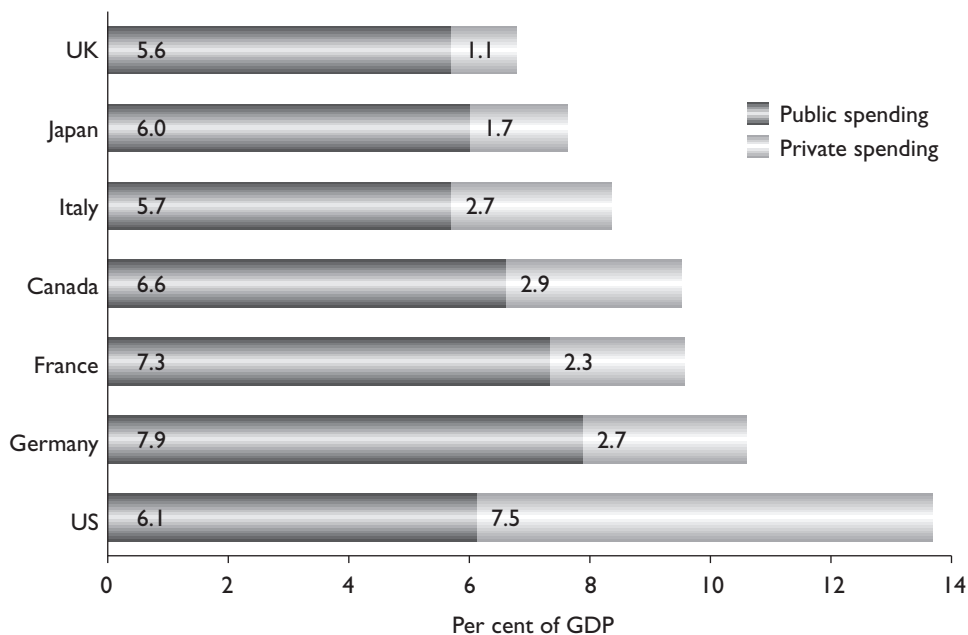
Note: Countries have been weighted by the size of their GDP. Currencies have been converted using 1998 exchange rates. An alternative methodology is to use purchasing power parities but in practice this makes little difference. For a discussion of the weighted and the less meaningful unweighted averages, see Chennells, Dilnot and Emmerson.[3]
Source: *OECD Health Data 2000: A Comparative Analysis of 29 Countries* (CD-ROM).

Table 1: Share of the private sector in total health care spending in the G7 countries, 1998

Country	Share of private sector (%)
US	55.3
Germany	25.4
France	23.6
Canada	30.4
Italy	32.0
Japan	21.7
UK	16.3

Note: Countries are ranked according to share of health spending in GDP.
Source: *OECD Health Data 2000: A Comparative Analysis of 29 Countries* (CD-ROM).

taking up 10.6 per cent and 9.6 per cent of their GDP respectively. Japan's and Italy's health care spending is closer to that of the UK, both with a public sector of similar size to ours but with a larger private sector in each case.

Partly as a response to the relatively low share of GDP spent on health care in the UK, the Government has pledged substantial real increases in NHS spending, averaging 6.2 per cent a year over the five-year period until March 2004. This is higher than the 3.4 per cent average real increase in spending that the NHS has received over its 50-year history.[1] The Prime Minister has also pledged that 'over time, we aim to bring it [NHS spending] up towards the EU average'.[2] Across the European Union average health spending in 1998 was 8.7 per cent of GDP, with the average (once the relatively low spending UK is excluded) being 9.1 per cent of GDP.[1] In fact, within the EU, only Luxembourg (5.9 per cent) and the Republic of Ireland (6.4 per cent) have a smaller health care sector than the UK. While the Government's planned increases in NHS spending could increase health spending

by 1.0 percentage point of GDP between 1998–99 and 2003–04, it is clear that these increases alone will not be sufficient to fully close the gap between UK health spending and the EU average by March 2004.

Another way in which the gap between health spending in the UK and that seen elsewhere could be closed is through growth in the role played by the private sector. Table 1 shows that while (from the point of view of spending) the private sector plays a role in the provision of health care in the UK, it is much smaller than the role played elsewhere. The US has by far the largest share of private spending amongst these countries, at 55.3 per cent. In Canada and Italy, the private sector accounts for around 30 per cent of health spending. In the UK, private spending amounts to just 16.3 per cent of the health sector, or roughly 1 per cent of our GDP.

The relatively small role played by the private sector in funding UK health care is largely due to the institutional set-up in the UK, where the publicly-funded NHS aims to provide free medical treatment

through GPs and hospitals for all UK residents. In theory at least, any private spending on health is a matter of individual choice rather than need. For the substantial number of people who have private health insurance, combined use of private and public medical services is the norm. They are typically still reliant on the NHS for certain types of care, most notably for primary care and emergency care, which has stayed within the domain of the NHS. Use of private medical facilities is not restricted to those who are insured. An estimated 20 per cent of patients in the private sector pay for treatment themselves.[4] However, as we show in the following section, coverage of private medical insurance has grown substantially over the last 45 years and is now a prominent feature of the UK health system.

PRIVATE MEDICAL INSURANCE IN THE UK

Over the last 45 years, there has been a large increase in the number of people covered by PMI, as shown in Figure 1. In 1955, just over 0.5 million individuals were covered by PMI compared to a peak of 6.8 million in 1998. Two-thirds of the total increase in coverage since 1955 occurred between 1979 and 1990, since when it has remained roughly flat. Interestingly, between 1998 and 1999 coverage actually fell by 440,000, down to 6.4 million people, the largest fall in coverage of PMI seen in any one year since 1955.

Figure 2 also shows that two-thirds of PMI is actually provided through an employer rather than purchased directly by an individual. There are at least two

Figure 2: Number of people covered by private medical insurance, 1955–99
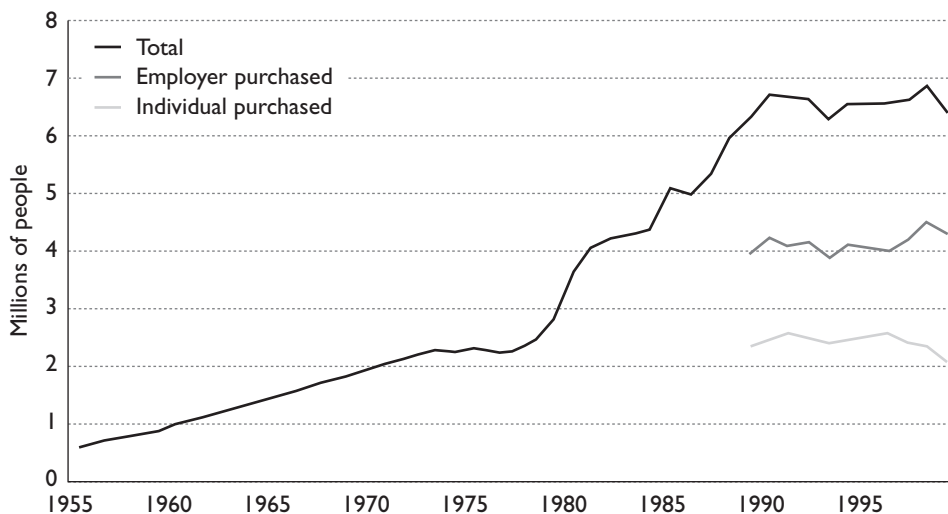
Notes: Data for whether the insurance was an employer or individual purchase are only available after 1989.
Sources: Office of Health Economics[5] for data prior to 1984; Laing and Buisson[6] for 1984 onwards.

reasons why it might be preferable to purchase health insurance through an employer rather than directly.

Firstly, a large employer is able to spread health risks across a large number of employees. This will help to mitigate the potential problem of adverse selection, where costs may escalate or the market may break down all together as only those individuals who are relatively likely to require health treatment decide to purchase insurance. This could potentially happen even if individuals did not know that they were more likely to be a bad health risk to the insurance company if, for example, they made their decision to purchase insurance after a parent or a sibling became ill.

Secondly, prior to April 2000, employers did not have to pay any employers' National Insurance on PMI. This gave employees an incentive to accept lower wages in return for insurance, rather than purchase it directly themselves.

CHARACTERISTICS OF THOSE WITH PRIVATE MEDICAL INSURANCE

Using data from the Family Resources Survey (FRS), we are able to construct a clearer picture of the individuals who have PMI.* Overall, 12.7 per cent of adults in the FRS are found to have PMI. This is similar to the 11.1 per cent of the population (i.e. including children) covered on average over the same five years in the published Laing and Buisson (L&B) data.[6] The FRS data also tells us whether the policy was paid for by

someone inside or someone outside the household, which we interpret as being paid for by an employer.** Unfortunately, the split between those reporting that they paid for the policy compared to those stating that someone else paid for the policy is not the same as in the industry L&B data. In the FRS data 57.8 per cent of individuals report that they paid for the policy, compared to one-third of those in the L&B data. This discrepancy could arise if some employers require a contribution from employees, or employers offer lower wages to employees who take up insurance, which is, unsurprisingly, interpreted by the individuals as them making a contribution rather than their employers.

Richer households are much more likely to have PMI than poorer households, as shown in Figure 3. Thus, 41.2 per cent of people in the richest 10 per cent of the population are privately insured, compared with under 3.7 per cent of those in the bottom 40 per cent. The likelihood of insurance being paid for by an employer increases with income. Thus, 50.7 per cent of those with health insurance in the top decile report that they have had it bought by an employer, compared with 25.5 per cent of those with health insurance in the bottom four income deciles. This is consistent with the idea that jobs which offer better remuneration are also more likely to offer other benefits, such as PMI. Another possible reason is that employers are more concerned about the health of more highly paid employees and hence are

*See Propper, Rees and Green[7] for a pseudo-cohort analysis of the demand for private medical insurance using the Family Expenditure Survey from 1978 to 1996. In addition, Propper[8] looks at actual use of private and public health care using the British Household Panel Survey. For more details of the FRS data see Appendix A.
** There may be situations where individuals are bought insurance by people, other than their employers, whom they do not live with (such as children or parents), although these cases are likely to be less important.

more likely to offer them packages that include PMI.

Coverage of PMI also varies by age and region, as shown in Table 2. The percentage of adults with insurance is lowest among the under-30s and the over-65s. Generational effects may be important too – evidence from Propper, Rees and Green[7] suggests that, while 30-year-olds are less likely to have PMI than 50-year-olds, 30-year-olds today are more likely to have it than 30-year-olds in the past. Table 2 also shows how coverage varies by region, with the proportions covered being highest in Greater London and the south-east, and lowest in the north.

In order to get a better understanding of the characteristics of those with and those without PMI, Table 3 presents some multivariate analysis. This shows that the age pattern observed in Table 2 still holds after the impact of other characteristics, such as income and employment status, is taken into account. We find that individuals in non-manual jobs are more likely to be insured independently of their income, although managers and technical staff are more likely to be insured than professionals. This is possibly due to the greater diversity of the 'professionals' group.

SHOULD THE GOVERNMENT ENCOURAGE THE TAKE-UP OF PRIVATE MEDICAL INSURANCE?

Increased use of private facilities can potentially ease the pressure on the NHS by freeing public spending that would otherwise have gone on those who have

Figure 3: Percentage of adults with private medical insurance, by income decile, 1995–96 to 1999–2000
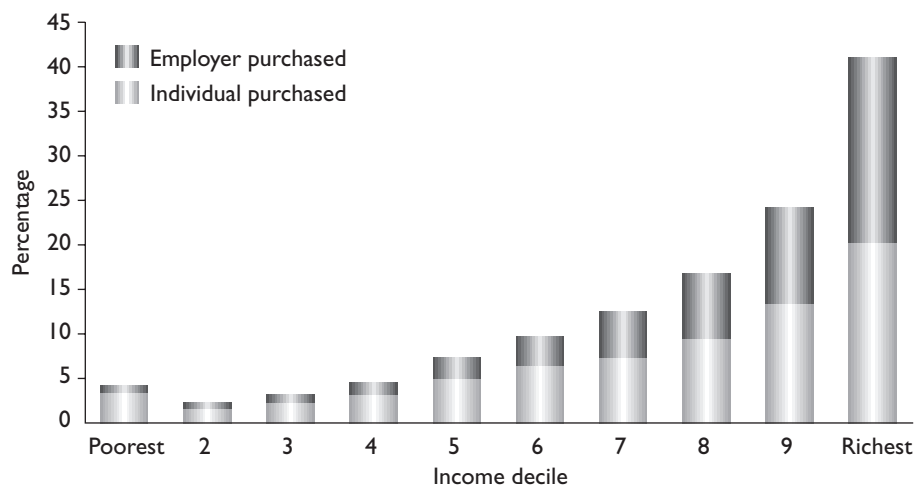
Sources: *Family Resources Survey*, 1995–96 to 1999–2000; authors' calculations.

Table 2: Percentage of people with private medical insurance, by age and region, 1995–96 to 1999–2000

	Age group					
Region	< 30	30–39	40–49	50–64	65+	Total
North	3.7	7.3	8.9	7.3	2.0	5.8
Yorks & Humberside	6.3	12.1	12.5	11.9	5.1	9.5
North-west	6.7	13.0	14.0	11.5	5.9	10.1
East Midlands	7.0	11.5	14.7	14.5	4.7	10.5
West Midlands	7.6	13.7	17.9	15.7	5.4	12.0
East Anglia	7.6	14.0	18.1	16.8	6.2	12.4
Greater London	13.8	20.8	20.8	18.9	9.9	16.9
South-east	13.1	24.1	27.4	26.2	13.1	21.0
South-west	6.8	12.0	15.5	16.3	9.2	12.1
Wales	4.7	9.4	11.4	10.0	4.0	7.8
Scotland	4.5	10.3	10.0	5.9	3.1	6.7
Total	8.5	15.4	17.2	15.7	7.2	12.7

Sources: *Family Resources Survey*, 1995–96 to 1999–2000; authors' calculations.

chosen to pay privately. In order to reduce demands on the NHS, the Government could encourage individuals to take out PMI, which would result in some treatment being paid for privately rather than through NHS spending. Previously, subsidies towards the cost of PMI have been implemented in two ways. First, prior to the July 1997 Budget, individuals aged over 60 received basic-rate tax relief on the purchase of PMI. This was regardless of whether they were actually income tax payers, and couples with one person aged 60 or over also qualified for the subsidy. Second, prior to April 2000, employers who purchased PMI for their employees did not have to pay any employers' National Insurance contributions on this benefit-in-kind.

The current Government has abolished all subsidies for those taking out PMI. The abolition of tax relief to the over-60s, announced in the July 1997 Budget, raised an estimated £135 million in 1999–2000 for the Exchequer.[9] The measures announced in the March 1999 Budget, which removed the exemption from employers' National Insurance contributions on all benefits-in-kind that were already liable for income tax, raised a total of £415 million in 2000–01,[10] part of which is from the extension of employers NICs to employer-provided PMI.

The issue of whether to subsidise PMI can be considered from two points of view – first, by looking at what kinds of people gain from the removal of such subsidies and second, the effect these subsidies are likely to have on the NHS.

EQUITY CONSIDERATIONS

It can be seen as fair that those individuals who have chosen to pay for

Table 3: Characteristics of those with private medical insurance

Characteristic	Impact on likelihood of having private medical insurance
Age	Individuals aged between 40 and 65 are found to be the most likely to be covered by PMI, with those aged over 70 and under 30 being the least likely.
Family situation	Individuals living in households without children are more likely to be covered. Individuals living in households containing either adult children or unrelated individuals are 1.4 percentage points less likely to be covered by PMI than others.
Gender	Men are found to be more likely to be insured than women, by 1.0 percentage point.
Income	For the vast majority of the population, income has a positive effect on possession of PMI, but this effect is found to decrease at higher income levels.
Employment status	Employees are found to be more likely to have PMI than either the self-employed or those out of work.
Education	Compared with those who left education at the minimum school-leaving age, those with college education are more likely to have insurance, while those with just A-levels are even more likely to be covered. The group with the highest probability of being covered by insurance is those still in education. They are likely to be covered by their parents' policies.
Housing tenure	Individuals in owner-occupied accommodation are 5.3 percentage points more likely to have PMI than others.
Regions	Individuals in the West Midlands, Greater London and the south-east are most likely to have PMI.
Occupation	Those in non-manual jobs are most likely to possess medical insurance. Managerial and technical staff are the most likely to have medical insurance, followed by professionals and skilled non-manual workers. Those in the armed forces are the least likely.
Savings	Individuals with higher levels of savings are found to be more likely to be covered by PMI.

Notes: All these results are significant at the 95 per cent confidence interval. For more details, see Appendix A.
Sources: *Family Resources Survey*, 1995–96 to 1999–2000; authors' calculations.

PMI and hence 'opt out' of some parts of NHS cover should receive a tax refund. This subsidy could reflect the saving to the Government from an individual choosing to 'opt out' of the parts of the NHS covered by PMI packages. This would be similar in practice to the reduced rate of National Insurance

contributions paid by individuals who have chosen to 'opt out' of the State Earnings Related Pension Scheme into their own private pension. There are, however, some complicated issues here, such as the extent to which PMI companies offer benefits over and above those offered by the NHS – for example private rooms and better choice of food. In addition, some PMI schemes overlap with State coverage – for example some only offer payments for conditions where waiting lists are above certain levels. Other schemes offer financial payment for insured individuals to take NHS treatment. The distributional effect of any potential subsidy should also be considered. The previous section provided details of those individuals who are more likely to have PMI. Among other things this showed that individuals covered by PMI were much more likely to be found towards the top of the income distribution and hence any subsidy given to those with PMI is likely to be regressive as long as higher expenditure on PMI among richer households is not mitigated by premiums taking a smaller proportion of their incomes. Those who would gain from any subsidy also tend to have higher levels of savings and are more likely to be owner-occupiers.

There are also concerns about the effect this might have on public willingness to contribute to the NHS through taxation. Research shows that those with PMI are less likely to support increases on public health spending, even after their other characteristics are taken into account.[11] This finding suggests that continued growth in private sector health care would have implications for the level of support for an NHS that is provided universally free at the point of use. It is of particular significance that those with medical insurance are likely to have higher incomes. These individuals may be more vocal in their opinions about the use of public funds and their concerns may be of particular importance as they will be paying more tax than average. It should be noted, though, that support for the NHS within this group, while reduced, still remains high.

COULD A SUBSIDY TO PMI BE SELF-FINANCING?

The removal of these subsidies is likely to have led to a reduction in the numbers covered by insurance and hence an increase in demands on the NHS. For example, the price of PMI for those aged over 60 will have increased by 29.9 per cent as a result of the removal of the income tax subsidy.* Depending on how responsive the demand for PMI is to changes in its price – known as the price elasticity of demand – this will have led to a reduction in coverage of PMI and potentially an increase in demands on the NHS. It is also true that the money saved from the subsidy could, alternatively, have been spent directly on the NHS. An interesting question, therefore, is whether a subsidy to the purchase of PMI can ever be self-financing in the sense that its cost is outweighed by the savings made by the reduction in demands on the NHS.

A simple model can be used to show whether it is likely that any subsidy to the NHS is self-financing. The cost to the Government from subsidising PMI depends on the rate at which the subsidy is given (t), the average cost of buying PMI before the subsidy (P_1), the number of people who already take out PMI (N_1)

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* The basic rate of income tax when relief was abolished in 1997 was 23 per cent, as opposed to the current level of 22 per cent, which was introduced in April 2000. This leads to a price increase 0.23/ (1–0.23), i.e. 29.9 per cent.

and the number of additional people who take out PMI as a result of the subsidy being offered (N_2). Hence, assuming that the subsidy does not affect the gross price of PMI,* then:

Cost of subsidy = $t \times P_1 \times (N_1 + N_2)$ (1)

The additional saving to the NHS will depend on the number of additional people who take out PMI as a result of the subsidy (N_2) and the average saving to the NHS from each of these individuals. This can be expressed as a proportion of the cost of these individuals purchasing PMI ($p - P_1$). The relative cost of the treatment these people will require if it is provided by the NHS compared with the cost of them purchasing PMI is represented by p.

Saving to the NHS = $p \times P_1 \times N_2$ (2)

It seems reasonable to assume that $0 \leq p \leq 1$. This is because $p = 0$ implies that there is absolutely no saving to the NHS from individuals who have taken out PMI. Values of p greater than 1 are only plausible if the PMI industry was able to provide health care more cheaply than the NHS. There are at least two reasons why p can be expected to be less than 1:

- **Quality of health care provided.** Individuals who have PMI will presumably expect to receive better quality, but more expensive, health care than that provided by the NHS. For example, in addition to patients not having to wait for treatment, PMI providers often point to other benefits – such as individuals being able to get additional facilities such as private rooms, en-suite bathrooms, televisions and telephones. To the extent to which these types of fringe benefits are not available on the NHS this will tend to reduce the saving to the NHS from each £1 of insurance bought.

- **Cost of providing health care.** Given the market power that the NHS is able to exert when setting the wages of doctors and nurses, it is likely that it will be able to deliver health care extremely cheaply. In 1993–94 the average hourly private sector wage across a range of specialties was at least three times higher than that in the NHS.[12] While the private sector may be able to deliver some aspects of health care more efficiently than the NHS,** it seems unlikely that the overall costs of each treatment will be lower.

There is evidence that equivalent treatment is more costly when undertaken by the private sector.[13] For example, a cataract extraction and lens prosthesis costs £1950 to £2600 when undertaken in the private sector compared with the NHS cost of £847, and a hip replacement costs £5800 to £7500 in the private sector compared with the NHS cost of £3678. This difference in price is due to both the quality and the costs of private sector care being higher than the NHS. This points towards the value of p being lower that 1, at least on the two procedures listed above.

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* This depends on how important fixed costs are in the provision of both PMI and NHS care.
** Recent years have seen efforts to improve the internal efficiency of the NHS, for example through the introduction of the 'internal market' at the start of the last decade. Evidence on the effect of this reform is mixed,[14,15] but the purchaser–provider split is generally judged to have been a success and is being maintained, despite the abolition of the internal market, in the recent restructuring that has seen the creation of new Primary Care Groups.[16]

Evidence on the actual value of p is provided by Department of Health,[2] which estimates that 'for a 65-year-old, private health insurance costs around 50 per cent more than equivalent NHS cost'. This would imply a value of p of 0.67.*

Hence, for any subsidy given to PMI to be self-financing the cost (given in (1)) needs to be less than or equal to the saving (given in (2)):

$$t \times P_1 \times (N_1 + N_2) \leq P_1 \times N_2 \times p \qquad (3)$$

Re-arranging (3) implies that:

$$N_2 \geq t \times N_1 / (p - t) \qquad (4)$$

If a subsidy were given equal to the current basic rate of income tax and this is available to all individuals (i.e. t = 0.22), and given that, according to the latest Laing and Buisson data (*see Figure 2*) there are currently 6.37 million policyholders (i.e. N_1 = 6.37 million), then equation (4) implies:

$$N_2 \geq 0.22 \times 6.37 / (p - 0.22) \qquad (5)$$

If we take the more extreme assumption that p = 1, *for the subsidy to be self-financing this would need an additional 1.8 million people to take out policies*. This is equal to growth in the market of 28 per cent. Smaller values of p would require even *more* individuals to take out insurance for the subsidy to be self-financing. For example, if the 0.67 value implied by the Department of Health[2] estimate was correct for the entire population, then for a 22 per cent subsidy to be self-financing would require PMI market growth of 49 per cent.** *This is*

equivalent to an additional 3.1 million subscribers.

We can also work out the minimum required price elasticity for the subsidy to be self-financing.***

Again taking the more extreme assumption of p = 1, this requires the elasticity to be at least –1.28. Smaller values of p would require demand to be even more responsive to changes in price. Although there is little UK evidence on price elasticities for PMI, this required elasticity can be compared to known price elasticities, for example the price elasticity of beer (a relatively inelastic good) has been estimated at –0.76, whilst the price elasticity for wine (a more price-elastic good) has been estimated at –1.69.[17] The minimum price elasticity for PMI for the subsidy to be self-financing lies between these two. We can also obtain further information about the price elasticity of PMI by analysing the impact of the removal of tax relief on PMI for the over-60s in the July 1997 Budget. We turn to this next.

WHAT EFFECT DID THE ABOLITION OF A PMI SUBSIDY HAVE?

In the 1997 Budget, the Labour Government abolished tax relief on private medical insurance that had been previously offered to those aged 60 or over. The Government estimated that 550,000 people would be affected by this measure, raising a total of £135 million for the Treasury by 1999–2000.**** The immediate effect of the abolition of tax relief was to increase the cost of PMI for

* Since $C / (1.5 \times C) = 0.67$.
** i.e. $0.22 / (0.67 – 0.22) = 0.49$.
*** $\text{Elasticity} = \dfrac{-(P_1 / N_1) \times (t \times N_1 / [p - t])}{(t \times P_1)} = \dfrac{-1}{(p - 0.22)}$
**** While one-third of a million policyholders lost tax-relief[9] these policies covered a total of 550,000 people. See Inland Revenue Press Release, *Tax relief for Private Medical Insurance to be ended*, 2 July 1997.

Table 4: Coverage of PMI among those receiving and those not receiving a subsidy

	Pre-reform	Post-reform	Difference
Aged under 60	13.8	14.6	0.8
	(0.1)	(0.2)	(0.2)
Aged 60 or over	9.2	8.8	–0.4
	(0.2)	(0.2)	(0.3)
Difference	4.6	5.9	
	(0.2)	(0.3)	
Difference in difference estimate			–1.2
			(0.4)

Note: Standard errors contained in parentheses.
Sources: *Family Resources Survey*, 1995–96 to 1999–2000; authors' calculations.

all over-60s by 29.9 per cent of the price they were paying previously.[*] In Table 4 we show the percentage of people covered by PMI pre-reform and post-reform according to their age. We consider the pre-reform period to be prior to July 1997, when the policy was announced and introduced, while the post-reform period starts in July 1998. This one-year gap is due to the fact that many individuals have year-long policies, thus causing a lag between when the reform was introduced and when its full effect was felt.[**] Prior to July 1997, 9.2 per cent of those aged 60 or over[***] were covered by PMI, while after July 1998 this number had fallen to 8.8 per cent of this age group.

Although there is no doubt that some of this decrease was due to the fact that some individuals found the cost of PMI prohibitively high in the absence of the subsidy, other factors may also have affected people's decision as to whether to take out PMI. One such may have been whether there was any change in their expectation of the quality of care they would receive from the NHS in the short- and medium-term future. One way of looking at what would have happened to coverage of PMI had the subsidy not been abolished is to look at coverage among a group not affected by the reform. Prior to July 1997, 13.8 per cent of those under the age of 60 were covered by PMI, rising to 14.6 per cent after July 1998. In the absence of the reform we might therefore have expected the proportion of those covered aged 60 or over to increase by an equivalent amount – that is 0.8 percentage points – provided that trends

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[*]The basic rate of income tax when relief was abolished in 1997 was 23 per cent, as opposed to the current level of 22 per cent, which was introduced in April 2000. This leads to a price increase of 0.23/ (1–0.23). Of course PMI prices may have been rising or falling over the period but 29.9 per cent represents the increase in price due to the removal of the subsidy.
[**] To qualify for the subsidy policies could not run longer than 12 months.
[***] Or with a partner aged 60 or over.

in coverage occur similarly across both age groups. Using the under-60s to control for general trends in coverage of PMI suggests that the removal of the subsidy reduced the coverage among those aged 60 or over by 1.2 percentage points. Given that 550,000 people were covered by schemes prior to its abolition, this will have led to a reduction in coverage of 6600 individuals.

One problem with using the estimate calculated above is that it will be biased if the composition of the groups aged under 60 and 60 or over may have changed between the pre-reform and the post-reform period. Multivariate analysis allows us to look at the change in coverage between those aged 60 or over and those aged under 60 once other characteristics, such as income, educational attainment and housing tenure, are controlled for. This is the same technique used by Gruber and Poterba,[18] who evaluate the impact of the introduction of tax relief for the self-employed in the United States using employees as controls. Even if the characteristics of the under 60 and the 60 and over population have not changed, use of multivariate analysis may help to increase the precision of our estimates.

A probit model also allows us to get round the problem that we do not have information on the quantity of PMI that individuals have purchased. This is potentially important since some individuals may have introduced greater excess payments, or restricted the coverage of their insurance packages as a result of the removal of the government subsidy. The results of this are shown in Table A in Appendix A. We find that, once other observable characteristics are controlled for, the effect of abolishing the subsidy on PMI reduced the number of people covered by 0.7 percentage points amongst the eligible population. Given that 550,000 people were covered by schemes prior to its abolition, this will have led to a reduction in coverage of around 4000 individuals. The 95 per cent confidence interval is that coverage will have fallen by between 500 and 7200 individuals. *While this will have led to some increase in demands on the NHS, it is clear that this will be less costly than the £135 million saved by the abolition of the subsidy.*

The estimate of the price elasticity of PMI from our probit model is that a 29.9 percentage point increase in price led to a 0.7 percentage point fall in quantity demanded.* Hence the estimated price elasticity of PMI is –0.024, with a standard error of 0.01.** This gives a 95 per cent confidence interval of –0.003 to –0.044. This suggests that PMI is an extremely price inelastic good (i.e. changes in price having very little effect on demand). Furthermore, this estimated elasticity is substantially lower than the lowest required price elasticity of –1.28 to make PMI tax subsidy to be self-financing.

CONCLUSION

The last 20 years have first seen a ten-year period of extremely large growth in the numbers covered by PMI (from 3.6 million in 1980 to 6.7 million in 1990),

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* The elasticity found assumes that prices will have been unchanged in the absence of the removal of the subsidy. In practice, PMI prices have in recent years tended to rise by more than inflation. Given that PMI coverage is below 50 per cent, the probit model implies that our estimate will tend to be an over-estimate of the responsiveness of demand for PMI to changes in price.
** The standard error of the elasticity is equal to $\sqrt{(((1-0.23)/0.23)^2 * 0.01^2)}$.

followed by ten years in which coverage has essentially remained flat. The rate of coverage is correlated with a variety of socio-economic characteristics, with those between the ages of 40 and 49 and higher-income individuals being more likely to possess insurance. For example, over 40 per cent of people in the top income decile are covered by PMI compared with under 5 per cent in the bottom four deciles. Moreover, the higher up the income distribution a person is, the more likely it is that their insurance has been provided by their employer.

The causes and implications of the trends in the coverage of PMI are both interesting and important from a public policy perspective. When considering why individuals might choose to buy health insurance, we obviously need to consider the link between the level and quality of NHS health care and the number of people purchasing PMI. For example, Calnan, Cant and Gabe[19] find that those with PMI are more likely to be dissatisfied with the NHS than those without it. Whether this is purely a cause or also partly an effect of those individuals being in possession of PMI is unclear. While it seems obvious that those who are dissatisfied with the quality of NHS provision will be more likely to purchase PMI, it is also highly plausible that some individuals may change their valuation of NHS provision after using private care paid for through employer-provided PMI.

One measure of the quality of NHS provision that does seem to be positively correlated with the greater purchasing of private health insurance is the length of waiting lists for NHS treatment. This could be an indication that waiting lists are a particular concern or, alternatively, that they are used as a barometer for NHS performance.[20,21] The fact that there is a link between waiting lists and the purchase of PMI is perhaps not surprising, given the degree to which the media and political parties have focused on them.

Despite the increase in use of the private sector, private spending on health care makes up only 16.3 per cent of total health spending in the UK, which is lower than in any other G7 country. In 1998, UK health spending was 6.7 per cent of GDP, which is some 2.4 percentage points lower than the average of the other 14 EU countries. The Government is eager to redress this balance and large increases in NHS spending have been planned until March 2004. The result will be that NHS spending will increase by 1.0 percentage point of GDP between 1998–99 and 2003–04. While substantial, these increases alone will be insufficient to fully close the gap between the UK and the rest of the EU by March 2004. Another way of increasing total spending on health would be to encourage people to take out PMI. This would have the added effect of reducing the demands on the NHS. Some individuals with PMI would in effect 'opt out' of the NHS for the treatments they were covered for.

One possibility would be for the Government to encourage individuals to take out PMI by offering a subsidy. We have considered whether the introduction of such a rebate could actually be self-financing, in other words, whether the saving to the NHS could be greater than the level of subsidies paid by the Treasury. Our analysis shows that this is unlikely to be the case, largely because a subsidy would benefit current holders of PMI while the saving to the NHS would only stem from the additional policies that would be sold due to the subsidy. It is

also the case that the purchase of PMI will lead to a decrease in demands on the NHS by less than the policy cost, as private health care is more costly due to the higher quality of care provided, for example through less waiting and greater provision of private rooms, and the higher costs faced by the private sector. Prior to 1997, such a subsidy existed for the over-60s – individuals with PMI received a subsidy equal to the basic rate of income tax on the cost of their insurance. We analyse the effect of the abolition of this subsidy on the demand for PMI and find that, on our best estimate, there was a 0.7 percentage point decrease in the number of people covered by such insurance. This is equivalent to nearly 4000 individuals. While this would clearly have led to increased demands on the NHS, the cost of treating these individuals is likely to have been substantially lower than the £135 million annual cost of the subsidy.

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APPENDIX A: MULTIVARIATE ANALYSIS OF THE CHARACTERISTICS OF THOSE WITH PRIVATE MEDICAL INSURANCE USING THE FAMILY RESOURCES SURVEY

The Family Resources Survey (FRS) is an annual survey of around 45,000 individuals that combines information on basic characteristics, such as family structure and employment status, with detailed income information. Although it does not contain information on direct expenditure on private medical treatment, the FRS records whether individuals are covered by PMI. We use combined FRS data for 1995–96 to 1999–2000 covering 214,334 individuals. Table A gives the results of multivariate analyses on the characteristics of those with PMI.

Table A: Individuals with private medical insurance

Characteristic	Probability of having private medical insurance	
	Coefficient	t-statistic
Interviewed between July 97 and July 98	0.003	1.05
Interviewed after July 97	−0.002	0.93
Aged 60 or over[a]	0.000	0.00
Interviewed between July 97 & July 98 & aged 60+[a]	−0.003	0.74
Interviewed after July 97 and aged 60+[a]	−0.007	2.20
Age	−0.017	5.08
Age ^{2} – squared	0.001	5.35
Age ^{3} – cubed	−0.000	5.10
Age ^{4} – power 4	0.000	4.51
Partner's age	0.018	3.34
Partner's age ^{2} – squared	−0.000	2.80
Partner's age ^{3} – cubed	0.000	2.32
Partner's age ^{4} – power 4	−0.000	1.95
Living with a partner	−0.293	3.52
Male	0.010	7.36
Other adult in household	−0.014	8.84
Person has child	0.021	11.61
Income / 1000	0.317	67.06
(Income / 1000) squared	−0.085	40.20
(Income / 1000) cubed	0.006	27.87
Employee	0.032	15.60
Self-employed	0.007	1.77
Owns home	0.053	32.15
Educated to A-level	0.038	21.42
College-educated	0.032	16.58
Still in education	0.107	13.31
Other information included	Chi–squared	p-value
Occupational dummies	768.94	0.000
Regional dummies[b]	1914.48	0.000
Household savings	357.61	0.000
Interaction of savings with having a partner	49.98	0.000
Year dummies	12.11	0.007
Month dummies	26.33	0.006
No. of observations	214,334	
Pseudo R-squared	0.197	

Note: [a]Or has a partner aged 60 or over. [b]Greater London and the south-east being the areas with the highest rates of coverage. A full set of results is available from the authors upon request.

REFERENCES

1. Emmerson C, Frayne C, Goodman A. *Pressures in UK Health care: Challenges for the NHS*. Commentary no. 81. London: Institute for Fiscal Studies and King's Fund, 2000.

2. Department of Health. *The NHS Plan: a plan for investment, a plan for reform*. Cm 4818-I. London: The Stationery Office, 2000.

3. Chennells L, Dilnot A, Emmerson C. *IFS Green Budget: January 2000*. Commentary no. 80. London: Institute for Fiscal Studies, 2000.

4. Office of Fair Trading. *Health Insurance*. London: OFT, 1996.

5. Office of Health Economics. *Compendium of Health Statistics*. 11th ed. London: OHE, 1999.

6. Laing and Buisson. *UK Market Sector Report 2000*. London: Laing and Buisson Publications Ltd, 2000.

7. Propper C, Rees H, Green K. *The demand for private medical insurance in the UK: a cohort analysis*. Working Paper no. 99/013. Bristol: University of Bristol, Centre for Market and Public Organisation, 1999.

8. Propper C. *The demand for private health care in the UK*. mimeo. Bristol: University of Bristol, Department of Economics, 1999.

9. HM Treasury. *Equipping Britain for our long-term future: Financial Statement and Budget Report, July 1997*. Hc85. London: HM Treasury, 1997.

10. HM Treasury. *Building a Stronger Economic Future for Britain: Financial Statement and Budget Report, March 1999*. Hc298. London: HM Treasury, 1999.

11. Brook L, Hall J, Preston I. What drives support for higher public spending? In: Taylor-Gooby P, editor. *Choice and Public Policy: The Limits to Welfare Markets*. London: MacMillan, 1998.

12. Monopolies and Mergers Commission. *Private Medical Services*. Cm 2452. London: HMSO, 1994.

13. Hennell T. People covered by private health insurance will not reduce consumption of NHS services. Letter. *BMJ* 2000; 321 (7265): 898.

14. Le Grand J, Mays N, Mulligan J. *Learning from the NHS Internal Market: A Review of the Evidence*. London: King's Fund, 1998.

15. Propper C, Croxson B, Perkins A. Do doctors respond to financial incentives? UK family doctors and the GP fundholder scheme. *Journal of Public Economics* 2001; 79 (2): 375–98.

16. Department of Health. *The New NHS: Modern, dependable*. Cm 3807. London: The Stationery Office, 1997.

17. Crawford I, Smith Z, Tanner S. Alcohol taxes, tax revenues, and the Single European Market. *Fiscal Studies* 1999; 20 (3): 287–304.

18. Gruber J, Poterba J. Tax incentives and the decision to purchase health insurance: evidence from the self-employed. *Quarterly Journal of Economics* 1994; 109 (3): 701–33.

19. Calnan M, Cant S, Gabe J. *Going Private: Why People Pay for their Health Care*. Oxford: Oxford University Press, 1996.

20. Besley T, Hall J, Preston I. *Private Health Insurance and the State of the NHS*. Commentary no. 52. London: Institute for Fiscal Studies, 1996.

21. Besley T, Hall J, Preston I. The demand for private health insurance: do waiting lists matter? *Journal of Public Economics* 1999; 72: 155–81.