CHERE
CENTRE FOR HEALTH ECONOMICS
RESEARCH AND EVALUATION

UNIVERSITY OF
TECHNOLOGY SYDNEY

UTS:CHERE

The Centre for Health Economics Research and Evaluation (CHERE) was established in 1991. CHERE is a centre of excellence in health economics and health services research. It is a joint Centre of the Faculties of Business and Nursing, Midwifery and Health at the University of Technology, Sydney, in collaboration with Central Sydney Area Health Service. It was established as a UTS Centre in February, 2002. The Centre aims to contribute to the development and application of health economics and health services research through research, teaching and policy support. CHERE's research program encompasses both the theory and application of health economics. The main theoretical research theme pursues valuing benefits, including understanding what individuals value from health and health care, how such values should be measured, and exploring the social values attached to these benefits. The applied research focuses on economic and the appraisal of new programs or new ways of delivering and/or funding services. CHERE's teaching includes introducing clinicians, health services managers, public health professionals and others to health economic principles. Training programs aim to develop practical skills in health economics and health services research. Policy support is provided at all levels of the health care system by undertaking commissioned projects, through the provision of formal and informal advice as well as participation in working parties and committees.

University of Technology, Sydney
City campus, Haymarket
PO Box 123 Broadway NSW 2007
Tel: +61 2 9514 4720
Fax: + 61 2 9514 4730
Email: mail@chere.uts.edu.au
www.chere.uts.edu.au

Do financial incentives for supplementary private health insurance reduce pressure on the public system? Evidence from Australia

Mingshan Lu[1] and Elizabeth Savage[2]

CHERE WORKING PAPER 2006/11

1. Department of Economics
University of Calgary
2500 University Drive NW
Calgary, Alberta, Canada T2N 1N4
lu@ucalgary.ca

2. Centre for Health Economics Research and Evaluation
Faculty of Business
University of Technology, Sydney
elizabeth.savage@uts.edu.au

First Version: August 2006
Current Version: August 2006

Abstract
In many developed countries, budgetary pressures have made government investigate private insurance to reduce pressure on their public health system. Between 1997 and 2000 the Australian government implemented a series of reforms intended to increase enrollment in private health insurance and reduce public health care costs. Using the ABS 2001 National Health Survey, we examine the impact of increased insurance coverage on use of the hospital system, in particular on public and private admissions and lengths of stay. We model probability of hospital admission and length of stay for public (Medicare) and private patients. We use Propensity Score Matching to control for selection in the insurance decision and estimate a two-part model for hospital admission and length of stay on the matched sample. Our results indicate that there is selection associated with insurance choice. We also find that unconditional public patient and private patient lengths of stay in 2001 differ markedly depending on insurance duration. Those with shorter periods of insurance coverage behave more like the uninsured than those insured prior to the insurance incentives. While the insurance incentives substantially increased the proportion of the population with supplementary cover, the impact on use of the public system appears to be quite modest. Increased private usage outweighs reduced public usage and the insurance incentives appear to be an extremely costly way of reducing pressure on the public hospital system.

Acknowledgements
This research is supported by an NHMRC program grant. Lu thanks the financial support from the Alberta Heritage Foundation for Medical Research and the Institute of Health Economics. We are grateful to the Australian Bureau of Statistics in providing the RADL service in using the data for this study. We thank Denise Doiron, Denzil Fiebig, Jane Hall, Tony Harris, Glenn Jones, Eddy van Doorslaer, Carol Propper, and participants at the 2nd Summer Workshop in Health Economics, Centre for Applied Economic Research, University of New South Wales, for their comments. Views expressed in this paper do not reflect those of the funding agencies.

1. Introduction

In many countries, budgetary pressures have made government investigate private health insurance as a means to reduce pressure on their public health system (OECD 2004). The options available to increase demand for privately funded health care and the effect on demand for public services depend on the extent of health cover provided by the public system, interactions between the public and private systems, and the role of private insurance which all vary across countries. Private insurance may cover services or individuals excluded from the public system (US, Netherlands and Germany), co-payments associated with universal public services (France), services not provided publicly (Canada and Switzerland), or duplicate private provision of services provided by the public system (UK, Australia, Ireland and New Zealand). Many countries have a mix of roles for supplementary private health insurance depending upon population subgroups or specific forms of care.

Public policy plays an important role in private insurance markets. Policies that restrict benefits, payments, provider networks and eligibility under the public system, drive demand for supplementary private insurance and influence the characteristics of those privately insured. For example, in countries with extensive public provision, it is not surprising to find a smaller proportion of the population with supplementary cover. Regulation of the supplementary market can encourage or discourage the purchase of private coverage. For example, policies offering the opportunity to opt-out of the public system may increase the size of private insurance market and use of the private health system; subsidies to private insurance or private provision can also potentially reduce the demand for public health care.

In Australia a universal public health care system, Medicare, was introduced in 1984. Subsequently the private health insurance coverage of the population fell steadily reaching its lowest level of just over 30% in 1998. This lead to a number of government initiatives designed to increase coverage and relieve pressure on the public hospital system by diverting hospital use from the public to the private system. In 1997 the government introduced a private insurance tax rebate for low income singles and families and a tax surcharge, of 1% of taxable income, for those on high incomes. The size of the rebate varied with the extent of cover (hospital and/or ancillary insurance) and with family size. The tax surcharge could be avoided by purchasing private health insurance. In 1999, the income-tested rebate was replaced with a constant 30% premium rebate, available to all regardless of income. In 2000 the third insurance incentive introduced an age gradient into the premium schedule. After July 15, 2000 all new enrollees aged over 30 pay a premium loading in future period of two percent for each year of age over 30 at entry. The loading is capped at 70 percent. Irrespective of age, people already insured prior to the deadline who maintain their cover are exempt from the loading. The 2000 reform was accompanied by extensive publicly-funded advertising under the theme “Run for Cover”. As a result of the insurance incentives, private insurance coverage in Australia increased from 30.1 percent in 1998 to 43 percent in 2000, a jump of nearly 50 percent, most of which occurred just prior to July 2000. There was also a change in the mix of the insured population with large fall in the percentage aged over 65 (Ellis and Savage, 2005).

This paper addresses a number of health policy questions. To what extent have the incentives for supplementary private insurance reduced public usage and thus reduced the demand for scarce public resources? What has been the impact on the private usage? Have the insurance incentives been a cost-effective way to relieve pressure on the public system? Using the 2001 Australian

National Health Survey (NHS), we model probability of hospital admission and length of stay for public and private patients. To control for selection in the insurance decision, we use Propensity Score Matching (PSM) and model hospital admission and length of stay using two part estimation. We determine how predicted unconditional lengths of stay vary with insurance status and duration, and compare the results from the matched and original datasets. We find that insurance choice is affected by the existence of selection.

In terms of hospital use, either as a Medicare or private patient, the newly-insured do not, at least in the short term, act like the long-term insured. They use the public hospital system more than the long-term insured and, compared with the uninsured, their increased private usage outweighs reduced public usage. The insurance incentives increased the proportion of the population with private cover substantially, but the impact on use of the public system appears to be less pronounced. Our results indicate that the incentives were a very expensive way to reduce pressure on the public system.

The paper is organized as follows. Section 2 summarizes the literature on the association between supplementary insurance and health service use. Section 3 reviews the role of supplementary health insurance, government intervention in private health insurance market, as well as the public and private hospital system in Australia. Data used for this study and descriptive statistics are described in Section 4. Section 5 discusses empirical strategies. Results are presented in Section 6 and section 7 concludes the study.

2. Health insurance and hospital utilization in Australia

The Australian Medicare system provides universal, tax-financed assistance for health care. It provides free treatment in a public hospital anywhere in Australia. It also subsidises GP and specialist consultations, medical services provided to private inpatients and drugs listed on the Pharmaceutical Benefits Scheme. Medicare reimburses 85% and 75% of the set fee on the Medical Benefits Schedule for outpatient and private inpatient medical services, respectively. Except for salaried doctors in public hospitals, doctors set their own fees and patients face out-of-pocket costs arising from gaps between the fee charged and the Medicare reimbursement, as well as from hospital charges for private treatment, and prescription co-payments (Hall and Savage, 2005).

Public patients treated in public hospitals forego choice of medical provider and are treated by specialists paid by the hospital. These specialists may be private practitioners, paid on a sessional basis or salaried staff specialists who are hospital employees but who also have rights to admit private patients. Waiting times for free treatment as a Medicare patient vary considerably depending on procedure.

Private health insurance in Australia is limited to covering private inpatient treatment in either a public or private hospital, to some portion of out-of-pocket medical gap for private in-hospital treatment, prostheses and devices provided to private in-patients, and to ancillary services such as dental and optical care, physiotherapy, chiropractic treatment and acupuncture. Hospital and ancillary insurance may be purchased separately although a majority of the insured population has both hospital and ancillary cover. Annual premiums vary depending upon the extent of cover, the front-end deductible and the state of residence. All applicants for a policy must be accepted by the fund and, prior to 2000, the premium charged for a policy could not vary by age, health status or any other personal characteristic.

Prior to the insurance incentives the private hospital sector was growing, despite the declining private insurance coverage of the population. During the ten years to 1996-97, the private hospital share of acute hospital admissions had been increasing at almost double the rate of public admissions and private bed-days at eight times the public growth rate (Hall and Savage, 2005). The private hospital share continued to increase after the implementation of the insurance incentives; between 1997-98 and 2001-02, total private hospital admissions increased by 7.9% per year compared with 1.3% for public hospital admissions. However the extent to which this can be attributed to the incentives is not clear from the aggregate data; in the three years prior to the commencement of the insurance incentives, the annual average growth rate for private admissions was also high at 7.1%.

3. Literature on supplementary private insurance and health utilization

There is a growing literature on the links between private cover and utilisation of the health system. Cutler and Zeckhauser (2000) provide a broad overview of the literature on the demand for health insurance. Studies in the US mainly focus on the evidence from the Medigap program, which provides supplementary coverage for Medicare patients (those aged over 65). For example, Ettner (1997) estimates a logit model of supplementary insurance and two-part models of US Medicare utilisation and expenditures using the 1991 Medicare Current Beneficiary Survey. For the supplementary insurance decision she finds modest but mixed evidence of self-selection on the basis of observed health status and strong wealth effects. Those who purchase their supplementary insurance as individuals are found to have higher total and physician expenditures than those with employer-provided policies.

In the UK about 14% of the population has private cover. Using several years of the British Social Attitudes Survey, Besley, Hall and Preston (1999) find that the demand for private health insurance is related to barriers to public care such as waiting time and that private coverage is associated with higher socio-economic status. They argue that individuals who opt out of public sector treatment free up resources for those who rely exclusively on the public system, although high-income individuals who are privately insured continue to use the National Health Service for a large array of treatments. Using the British Household Panel Survey, Propper (2000) finds finds considerable movement between the public and private sectors, revealing a complex relationship between public and private sector use.

In Ireland, private insurance coverage increased from 15% to about 40% between 1970 and 2000, despite increased access to public care, annual premium increases and reduced tax relief. Harmon and Nolan (2001) examine this growth and jointly estimate the insurance and the utilisation of inpatient hospital services using data from the 1994 Living in Ireland Survey. Treating insurance as exogenous, they find that private cover increases utilisation by about 3%; this increases to 6% when the insurance decision is treated as endogenous.

In France, public coverage is universal but incomplete and most people (85%) have supplementary insurance to lower out-of-pocket costs. Using data from the 1998 Enquete sur la sante et la protection sociale, Buchmueller et al. (2004) find no evidence that sicker people purchase more cover. Despite this, supplementary insurance is found to have a large and statistically significant effect on the probability of a physician visit.

In Catalonia Spain, the public national health system coexists with a developing supplementary private system. Using a representative survey from Catalonia, Costa-Font and Font-Vilalta (2004)

simultaneously model the use of the NHS and demand for private insurance and find that private cover lowers the use of publicly provided primary and specialized services.

Using data from 4 waves of the European Community Household panel, Jones, Koolman and van Doorslaer (2004) estimate the impact of private health insurance on specialist visits in Ireland, Portugal, Italy, Spain and the UK. They find that private cover increases with income and sometimes with better self-reported health status, and that private cover increases the probability of a specialist visit.

In Australia, factors influencing the demand for private insurance coverage have been examined using data from the National Health Surveys undertaken by the Australian Bureau of Statistics. Using 1989 and 1995 NHS data respectively, Savage and Wright (2003) and Barrett and Conlon (2003) find a strong association between demand for insurance and income. Savage and Wright also examine the association between utilisation and insurance for private hospital length of stay. They find that insurance can more than double the average length of private hospital stay. In this paper, we focus on the impact of insurance and insurance duration on public and private hospital use in the period following the introduction of the insurance incentives.

4. Data and descriptive results

We use the NHS 2001 to study the impacts of the private insurance reforms on public and private hospital treatment. The survey is a representative household survey and provides a rich source of data on demographics and household composition, employment, risk-related behaviours, long-term conditions, insurance status and use of the health system. It is a representative sample of 17,918 private dwellings across Australia and has data on 26,862 individuals. Within each household there is data on one adult (> age 18), all children aged 0 – 6 years, and one child aged 7-17 years. For this study, we restrict our sample to non-dependent individuals aged 18 or more, leaving a sample of 17,694 individuals across Australia.

A key variable in the data relates to the duration of private insurance cover for those currently insured at the time of the survey. Starting from 1997, the Australian government imposed a series of incentive policies to encourage the uptake of private insurance. Figure 1 shows the insurance coverage of the population between 1983 and 2004. The dashed vertical lines indicate the timing of the insurance incentives implemented in 1997, 1999, and 2000. The shaded area shows the period over which the NHS 2001 survey was undertaken.

Figure 1 near here

Using data on time of purchase of insurance, we create five duration dummies: five or more years (dge5); two to less than five years ago (d2tolt5); one to less than two years (d1tolt2); less than one year (dlt1); and not insured (d0). These dummies capture not only how long ago an individual took up private insurance, but are also indicative of whether her/his decision to purchase the private insurance was potentially influenced by one of the government incentives. For example, those who have had private insurance cover for five or more years, the “long-term insured”, purchased private insurance before the Australian government implemented the incentive policies. Those who have held private insurance for less than five years are the “newly-insured”. Among this group, those who have had private insurance for two to five years were likely to be influenced by the government 1997 incentive policy; and less than two years by some combination of the 1999 private insurance rebate and the 2000 “Run for Cover” policy.

For each individual, the NHS provides data on hospital admissions in last 12 months. We also know their patient status at the most recent admission – Medicare if they chose to be admitted as a public patient and face no out-of-pocket costs; or private if they chose to be admitted as a private patient and fund their treatment by some combination of private insurance and out-of-pocket costs. There is also data on length of most recent hospital stay.

Figure 2 near here

Figure 2 shows the data structure of the sample to be analysed. Of the sample, 47% have private cover and two thirds of these were insured more than five years. Most of the new enrolees obtained cover during the later years of the insurance reforms. Irrespective of insurance status, about 14.5% were admitted to hospital in the last 12 months. Interestingly, insurance status influences but does not wholly determine patient status when admitted to hospital; of privately insured hospitalised individuals, 22% choose to be public patients and of uninsured hospitalised individuals, about 12% choose to be private patients.

Table 1 near here

Table 1 presents means for demographic variables, educational qualifications, income of the unit, location, self-reported health status, risk factors and prevalence rates of a large array of long term health conditions for the full sample and also broken down by insurance status. Table 1 also presents tests of difference between means for the two insurance groups. To determine whether observed characteristics are significantly different between these two groups, t-tests are used for continuous variables and chi-square tests for binary variables; p-values of these tests are presented in the final column of the table. For most covariates, there is a significant difference between the insured and uninsured groups ($p<0.01$). Relative to the uninsured, those with supplementary insurance are more likely to be middle-aged and married, more highly educated, with higher family income, less eligible for additional health care assistance and more likely to reside in capital cities. Where there are significant differences in the prevalence of long term conditions, the insured tend to have lower incidence. They also have better self-reported health, are more likely to exercise and much less likely to be a regular smoker.

Focusing on those who were hospitalized in the last year, we distinguish four groups: a) those with private hospital coverage treated as Medicare patient; b) those with private hospital coverage treated as private patient; c) those without private hospital coverage treated as Medicare patient; and d) those without private hospital coverage treated as a private patient. Means and standard deviations for these four subgroups are presented in Table 2. Those for whom patient status was 'not stated' are excluded from the means in Table 2 and from the subsequent analysis. A much higher proportion of the long term insured choose to be private patients when admitted to hospital than those with shorter insurance durations. The uninsured and those with supplementary insurance for less than two years have similar public patient admission rates. There appear to be some interesting patterns in the prevalence of long term conditions for those choosing public versus private treatment and this differs depending on insurance status; there is higher prevalence of many conditions for uninsured individuals who choose to be admitted as private patients.

Table 2 near here

5. Empirical strategies

There two major empirical challenges for the analysis. First, we have a continuous non-negative outcome variable, length of hospital stay, with large numbers of zeros and a skewed conditional distribution. To address this we use the multivariate two-part model developed by Duan et al. to examine how insurance affects hospital use (Duan et al. 1983). Multi-part models were developed as part of the RAND Health Insurance Experiment (Manning et al. 1987). The approach is commonly used to model health care utilisation (Ettner 1997; Liu et al. 1999; Seshamani and Gray 2004). To control for individual characteristics we include a large number of explanatory variables in the two-part estimation, including demographic characteristics, household structure, qualifications, income and concession card status, states and regions, self-assessed health and risk factors, and long term conditions.

The second challenge is the potential endogeneity in insurance choice. An individual's decision to purchase supplementary private insurance is affected by many factors, such as her perception of her health status, expected health cost, as well as socioeconomic status and level of risk aversion. These factors are also likely to impact on hospital utilization. Controlling for individual characteristics in the two-part estimation does not necessarily reduce the bias associated with selection due to insurance choice. Individual characteristics may confound with insurance choice in a nonlinear fashion. Furthermore, the distribution of these covariates may have little overlap between the insured and uninsured.

In order to deal with these issues, we use propensity score matching (PSM) to identify the effect of private insurance on hospital utilisation. By matching treatment and control observations that have similar insurance propensities, the technique aims to eliminate the potential selection bias. It has been shown that matching on the propensity score is equivalent to matching on the basis of the individual characteristics vector (Rubin 1973; Rosenbaum and Rubin 1983, 1985). It is important to note that the PSM method eliminates the selection bias only if, conditioning on the propensity score, the insurance choice is unrelated to any unobserved variables. In other words, if insurance choice is not random among individuals with the same value of propensity score, selection bias remains.[1] On the other hand, if the observable characteristics are correlated with the unobservables, then using PSM model could "balance out" the latter by controlling for the former. PSM methods are increasingly used in health economics to address the issue of selection bias (Shen 2002).

To create propensity scores we run a logit model of insurance choice. We use the predicted insurance probabilities to match treatment observations (the insured) with controls (the uninsured). We use the Greedy 5->1 digit match algorithm (Parsons 2000), made available by the author.[2] The procedure makes "best" matches first then "next-best" matches in a hierarchical sequence until no more matches can be made. Best matches are those with the highest digit match on propensity score. The algorithm proceeds sequentially to the lowest digit match on propensity score. We modify Parson's Greedy algorithm to introduce replacement of matched controls after each level of digit match.[3] Using this technique, 7,369 (88.6 percent) of those with private

[1] To control for the selection bias caused by unobservable factors, methods such as instrumental variable approach or structural estimation could be used. However, the NHS data do not provide any variable that could serve as valid instrument for insurance.
[2] Available at http://www2.sas.com/proceedings/sugi26/p214-26.pdf
[3] Abadie and Imbens (2002) provide arguments in favour of replacement.

insurance in the original sample were matched to a control.[4] Matching aims to balance the distributions of observed covariates between "treatment" and "control" groups based on similar assignment probabilities.

We run two-part models on both the original and matched samples, for both Medicare and private admissions and Medicare and private lengths of stay. Stage 1 involves the estimation of a multinomial logit model for probability of admission (non-admission, Medicare admission, private admission). The results for the matched samples are presented in Appendix Table A1. In stage 2, OLS regressions of the log of length of stay are run for the two subgroups of admitted patients. The results for the matched dataset are presented in Appendix Table A2.

Predicted admission probability and lengths of stay for all observations are combined to give estimates of unconditional Medicare and private length of stay. Finally we calculate the marginal effects of key variables (time insured) on the unconditional outcomes and use bootstrapping to derive confidence intervals around the estimates of marginal effects.

6. Results

Table 3 near here

Table 3 presents means of explanatory variables for the matched sample by insurance status. Differences between means for matched pairs are evaluated and p-values presented in the final column of the table. In contrast to the results for the unmatched data presented in Table 1, there are no longer significant differences between the insured and uninsured groups except for two variables (age 20 to 30, and significant ear, nose and throat disorder). This provides evidence that the matching technique addresses the issue of selection bias in insurance choice due to observable differences.

Tables 4 and 5 near here

Using the estimated probabilities of admission and predicted lengths of stay, we calculate predicted probabilities of hospital admission, length of stay conditional on admission and unconditional length of stay for Medicare admissions (Table 4) and private admissions (Table 5). In each case, results are presented for the matched and original samples and for five cases: no supplementary insurance (p0), insurance duration less than 1 year (plt1), between 1 and 2 years (p1tolt2), between 2 and 5 years (p2tolt5), and more than 5 years (pgt5). Bootstrapped standard errors are derived using 500 draws from the matched and original datasets. Figures 3 and 4 present the results graphically.

Figures 3 and 4 near here

For the matched sample the average predicated probability of a Medicare admission for the uninsured is 8.7%. This declines monotonically with duration of insurance, from 7.6% for those insured less than 1 year to 2.1% for those insured more than 5 years. For those with a Medicare admission, length of stay is quite flat across the range of insurance status; however there is a peak of 3.8 days for those who became insured during the earliest period of the insurance reforms. The unconditional Medicare length of stay (calculated as the product of predicted probability and

[4] Estimation results for the insurance decision are available on request.

predicted length of stay for the whole sample) is, not surprisingly, highest for the uninsured (0.25 days). However, those with shorter insurance durations are predicted to have Medicare lengths of stay between 2 and 3 times as long as the long term insured.

For the matched sample, the probability of a private admission is predicted to be low (1.5%) for the uninsured. The highest admission probability is 17.1% for those insured between 2 and 5 years, exceeding that for those insured more than 5 years (14.2%). For those admitted as private patients, length of stay is again quite flat across the range of insurance status; and again it is longest for insurance durations between 2 and 5 years (4.3 days). Unconditional private length of stay is very low for the uninsured (0.04 days) and tends to rise with insurance duration with a peak of 0.74 days for the 2 to 5 year insurance duration.

Comparing the results for the matched samples with those for the original samples, we find that the selection associated with insurance choice overstates Medicare admission probabilities, especially for the uninsured and those with shorter insurance durations. This pattern carries through to unconditional Medicare lengths of stay. For private admissions, the impact of selection is smaller; however unconditional lengths of stay of private admission are somewhat understated without the correction for selection.

Table 6 near here

To determine a measure of the overall impact on hospital use of the insurance reforms, Table 6 combines the simulation results for Medicare and private admissions for the matched sub-sample. The upper part of the table shows how Medicare, private and total unconditional length of stay change with insurance status and the lower part of the table presents corresponding changes in admission probabilities; both are relative to the uninsured. Overall, shorter insurance durations are associated with higher probabilities of hospital admission and longer unconditional lengths of stay compared with the uninsured. This is because increases in private admission probabilities and length of stay more than offset the falls in Medicare treatment associated with increased insurance coverage. For those with short insurance durations the predicted unconditional Medicare length of stay is quite close to that of the uninsured; it remains approximately half that of the long-term insured even for insurance durations of 2 to 5 years.

The results provide evidence that the insurance incentives reduced pressure on the public hospital system at least to some extent. However, it is not clear that the budgetary cost associated with the incentives is justified by the reduction in public inpatient treatment. In 2001/2 the government's 30% subsidy to private health insurance premiums amounted to $A2.1 billion. Using the estimated reductions in Medicare admissions and hospital days, we undertake a preliminary analysis of the cost effectiveness of the private insurance incentives. We find that the cost of the rebate amounts to $28,606 per reduced Medicare admission or $11,055 per reduced Medicare patient day. We can compare these with the actual average cost per admission and per day in a public hospital in 2001/02: $2,861 per admission and $858 per day. The comparison would be even more dramatic if we took account of the budgetary cost of the medical subsidies to private hospital treatment associated with higher rates of private hospital usage of the newly insured.

In the longer term, as individuals gain experience with the private system the behaviour of the newly insured could become more like that of the long-term insured. If we recalculate the cost effectiveness of the rebate applying rates of Medicare use for the long-term insured to those newly

insured, the costs are reduced to $11,835 per admission and $4,091 per day, still far exceeding the average costs of public treatment.

7. Discussion

Our results on admission probabilities and unconditional lengths of stay differ for the original and matched samples, indicating the existence of selection associated with insurance choice. Unconditional Medicare and private lengths of stay also differ by length of time with private insurance cover. Shorter periods in cover are associated with behaviour more like that of the uninsured than those insured prior to the insurance incentives. Even for insurance durations between 2 and 5 years (well after any waiting period for reimbursement for private treatment would have been exhausted) the use of Medicare system resembles that of the uninsured more than the long term insured. We find robust evidence that among those with private hospital insurance, those who were insured for less that two years are consistently more likely to use public hospital as Medicare patient, and even stay in public hospital longer than those insured more than 5 years. The use of the private system is highest for those insured between 2 and 5 years with considerably larger unconditional lengths of stay for this group than any other.

In summary, the insurance incentives increased supplementary private cover substantially but the impact on their use of the public system appears to be less pronounced. The newly-insured do not, at least in the short term, act like the long-term insured in terms of Medicare and private hospital use. Increased private usage outweighs reduced public usage. This effect may change with longer insurance durations, a topic for future research. Even if this happens, the insurance incentives appear to be a relatively ineffective and extremely costly way of reducing pressure on the public hospital system.

References

Abadie, A. and G. Imbens, 2002, Simple and Bias-Corrected Matching Estimators for Average Treatment Effects, NBER technical working paper no. 283

Australian Bureau of Statistics (ABS) 2002, National Health Survey 2001, Confidentialised Unit Record Files

Barrett, G.F. and Conlon, R, 2003, Adverse selection and the contraction in the market for private health insurance: 1989-1995, Economic Record

Besley, Timothy, Hall, John and Preston, Ian, 1999, The Demand for Private Health Insurance: do waiting lists matter, Journal of Public Economics, 72, 155-181

Buchmueller, Thomas C, Couffinhal, Agnes, Grognon, Michel and Perronnin, Marc, 2004, Access to Physician Services: does supplemental insurance matter? evidence from France, 2004, Health Economics, 13, 669-687

Butler, J.R.G 2002, Policy Change and Private Health Insurance: Did the Cheapest Policy do the Trick?, Australian Health Review, 25(6), 33-41.

Costa-Font, Joan and Font-Vilalta, 2004, Preference for National Health Service Use and the Demand for Private Health Insurance in Spain, The Geneva Papers on Risk and Insurance, 29, 705-718

Cutler, D. M., and R. J. Zeckhauser, 2000, The Anatomy of Health Insurance, in: J. A. Culyer and J. P. Newhouse, eds., Handbook of Health Economics (Amsterdam: Elsevier, Chapter 11).

Duan, N., W.G. Manning, C.N. Morris, and J.P. Newhouse, 1983. A comparison of alternative models for the demand for medical care. Journal of Business & Economic Statistics, 1(2): 115-126.

Duan, N., W.G. Manning, C.N. Morris, and J.P. Newhouse, 1984. Choosing between the sample-selection model and the multi-part model. Journal of Business & Economic Statistics, 2(3): 283-289.

Ettner, Susan L, 1997, Adverse Selection and the purchase of Medigap insurance by the elderly, Journal of Health Economics, 16, 543-562

Hall, J. De Abreu Lourenco R, and Viney R (1999) Carrots and Sticks – the rise and fall of private health insurance in Australia, Health Economics, 8, 653-660.

Harmon, C. and Nolan, B. 2001. Health insurance and health services utilization in Ireland. Health Economics 10:135-145.

Hall, Jane and Elizabeth Savage, 2005, The role of the private sector in the Australian healthcare system, in The Public-Private Mix for Health Maynard, Alan (ed) The Nuffield Trust

Liu JL, Liu JT, Hammitt JK, Chou SY, 1999, The price elasticity of opium in Taiwan, 1914-1942. Journal of Health Economics 8(6):795-810

Manning, W.G. et al., 1987. Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment. American Economic Review 77(3): 251-277.

OECD, 2004, Private Health Insurance in OECD Countries. ISBN: 9264015639.

Parsons, LS., 2000, Using SAS_ Software to Perform a Case-Control Match on Propensity Score in an Observational Study, Proceedings of the Twenty-Fifth Annual SAS Users Group International Conference, Cary, NC: SAS Institute Inc., 2000; 1166-1171.

Propper, Carol, 2000, The Demand for Private Health Care in the UK, Journal of Health Economics, v. 19, iss. 6, pp. 855-76

Rosenbaum, P.R., Rubin, D.B., 1983. The central role of the propensity score in observational studies for causal effects. Biometrika 70: 41-55.

Rosenbaum, P.R., Rubin, D.B., 1985. Constructing a control group using multivaritate matched sampling methods that incorporate the propensity score. The American Statistician 39: 33-38.

Rubin, D.B., 1973. The use of matched sampling and regression adjustment to remove bias in observational studies. Biometrics 29: 185-203.

Savage, E. and D. Wright, Moral Hazard and Adverse Selection in Australian Private Hospitals: 1989-90, 2003, Journal of Health Economics, 22, 331 – 359

Seshamani M, Gray AM, 2004, A longitudinal study of the effects of age and time to death on hospital costs. Journal of Health Economics 23(2):217-35.

Shen Y.C., 2001. The effect of hospital ownership choice on patient outcomes after treatment for acute myocardial infarction. Journal of Health Economics 21: 901-922.

Figure 1: Timing of the private health insurance incentives

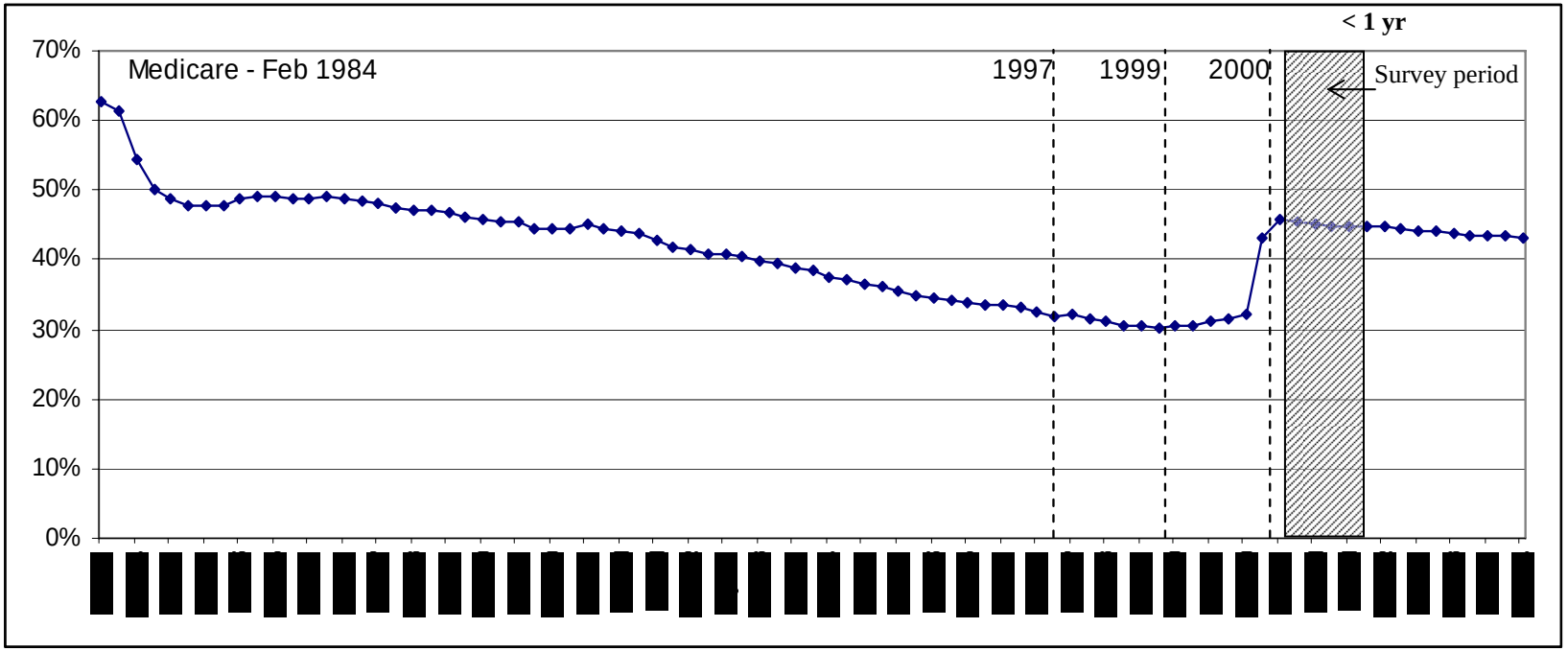


Figure 2: Breakdown of the sample by insurance and admission status

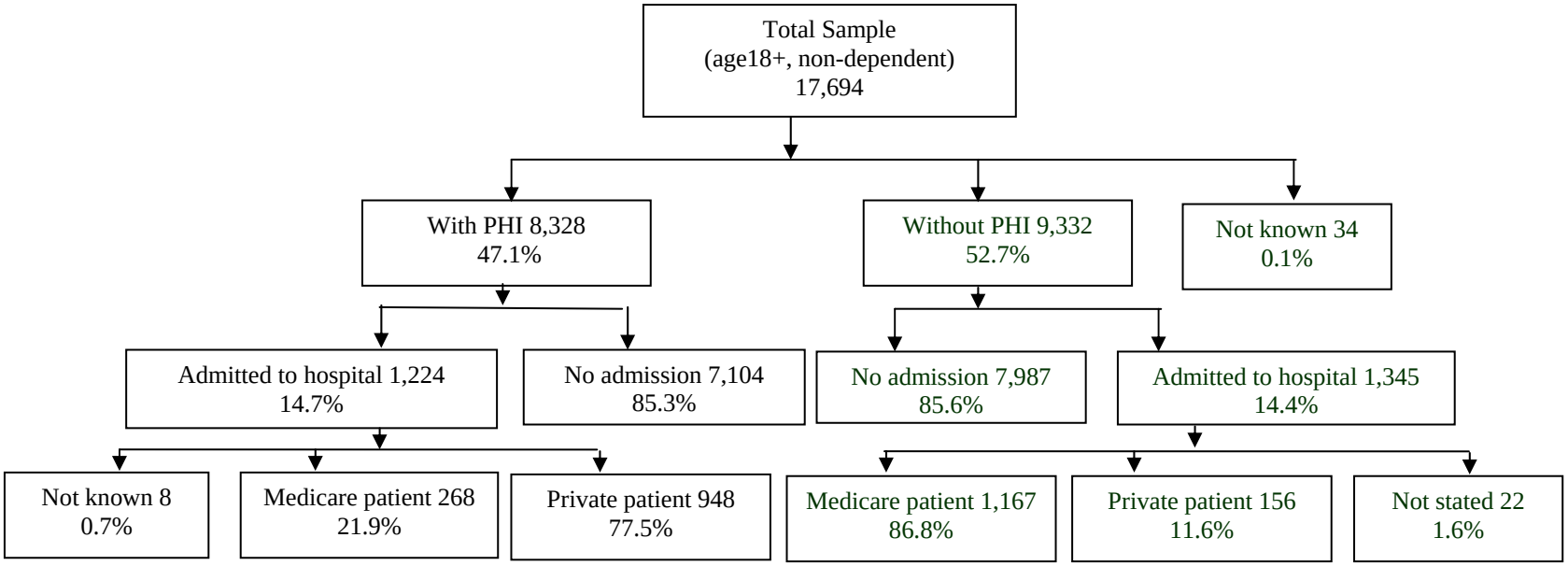


Table 1: Means and tests of difference between means for the full sample and insured and uninsured sub-samples

	Full sample 17,694		Uninsured 9,366		Insured 8,328		Test of means
Variable	***Mean***	***Std Dev***	***Mean***	***Std Dev***	***Mean***	***Std Dev***	***P-value***
age20lt30	0.153	0.360	0.204	0.403	0.095	0.294	**<.0001**
age30lt40	0.219	0.413	0.212	0.409	0.227	0.419	**0.018**
age40lt50	0.211	0.408	0.175	0.380	0.252	0.434	**<.0001**
age50lt60	0.152	0.359	0.119	0.324	0.189	0.391	**<.0001**
age60lt65	0.061	0.240	0.058	0.235	0.064	0.245	0.106
age65lt75	0.102	0.303	0.106	0.308	0.098	0.297	0.069
agege75	0.083	0.276	0.099	0.299	0.066	0.248	**<.0001**
female	0.545	0.498	0.542	0.498	0.548	0.498	0.491
married	0.563	0.496	0.466	0.499	0.671	0.470	**<.0001**
children	0.676	1.050	0.666	1.056	0.688	1.043	0.165
tertiary	0.163	0.369	0.094	0.292	0.240	0.427	**<.0001**
diploma	0.095	0.293	0.075	0.263	0.117	0.322	**<.0001**
otherqual	0.245	0.430	0.249	0.432	0.241	0.428	0.228
incomek	0.886	0.636	0.676	0.450	1.122	0.726	**<.0001**
missoinc	0.390	0.488	0.178	0.382	0.184	0.388	0.268
concard	0.017	0.130	0.533	0.499	0.228	0.420	**<.0001**
dvapen	0.021	0.144	0.024	0.154	0.009	0.096	**<.0001**
dvawid	0.220	0.414	0.033	0.179	0.008	0.087	**<.0001**
NSW	0.207	0.405	0.223	0.416	0.217	0.412	0.313
VIC	0.176	0.381	0.208	0.406	0.206	0.404	0.750
QLD	0.117	0.321	0.187	0.390	0.162	0.369	**<.0001**
SA	0.123	0.329	0.119	0.324	0.114	0.318	0.286
WA	0.065	0.247	0.115	0.319	0.133	0.340	**0.000**
TAS	0.015	0.121	0.067	0.251	0.062	0.242	0.175
NT	0.077	0.267	0.015	0.122	0.014	0.119	0.631
ACT	0.666	0.472	0.065	0.246	0.091	0.287	**<.0001**
capital	0.048	0.215	0.628	0.483	0.708	0.455	**<.0001**
notcapurban	0.236	0.424	0.050	0.219	0.046	0.210	0.198
otherurban	0.119	0.324	0.270	0.444	0.197	0.398	**<.0001**
rural	0.119	0.324	0.119	0.324	0.119	0.324	0.996
excellent	0.172	0.377	0.149	0.356	0.198	0.398	**<.0001**
verygood	0.318	0.466	0.286	0.452	0.354	0.478	**<.0001**
good	0.311	0.463	0.319	0.466	0.302	0.459	**0.015**
fair	0.147	0.354	0.174	0.380	0.116	0.320	**<.0001**
poor	0.052	0.223	0.072	0.259	0.030	0.170	**<.0001**
thin	0.078	0.268	0.088	0.283	0.066	0.249	**<.0001**
normal	0.465	0.499	0.472	0.499	0.458	0.498	0.054
overweigt	0.307	0.461	0.287	0.453	0.328	0.470	**<.0001**
obese	0.150	0.357	0.153	0.360	0.148	0.355	0.343
missbmi	0.087	0.282	0.103	0.303	0.070	0.255	**<.0001**
exhigh	0.058	0.234	0.054	0.226	0.063	0.243	**0.010**
exmod	0.248	0.432	0.233	0.423	0.265	0.441	**<.0001**
exlow	0.384	0.486	0.362	0.481	0.409	0.492	**<.0001**
exsed	0.009	0.097	0.009	0.096	0.010	0.098	0.828
exno	0.300	0.458	0.342	0.474	0.254	0.435	**<.0001**
smokes	0.233	0.423	0.308	0.462	0.148	0.355	**<.0001**
drinks	1.177	2.443	1.177	2.753	1.177	1.922	0.996
missalc	0.000	0.017	0.000	0.021	0.000	0.019	0.823

Table 1: continued

	Whole sample 17,694		Uninsured 9,366		Insured 8,328		Test of means
Variable	***Mean***	***Std Dev***	***Mean***	***Std Dev***	***Mean***	***Std Dev***	***P-value***
Other Infectious Diseases	0.058	0.234	1.177	2.753	1.177	1.922	0.996
Breast, Prostate, Colon Cancers	0.248	0.432	0.000	0.021	0.000	0.019	0.823
Other Neoplasms	0.384	0.486	0.019	0.136	0.017	0.128	0.292
Diabetes with No Complications	0.009	0.097	0.038	0.191	0.027	0.162	**<.0001**
Type I Diabetes Mellitus	0.300	0.458	0.006	0.080	0.005	0.072	0.278
Other Endocrine/ disorders	0.233	0.423	0.081	0.273	0.088	0.283	0.125
Peptic Ulcer, Hemorrhage, etc	0.036	0.186	0.039	0.193	0.033	0.178	**0.036**
Other Gastrointestinal Disorders	0.077	0.266	0.075	0.263	0.079	0.270	0.238
Rheumatoid Arthritis, etc	0.035	0.183	0.039	0.194	0.030	0.170	**0.001**
Disorders of the Vertebrae, Spine	0.006	0.078	0.006	0.080	0.006	0.076	0.584
Osteoporosis, Bone/Cartilage	0.034	0.182	0.033	0.179	0.035	0.185	0.420
Other Musculoskeletal	0.417	0.493	0.421	0.494	0.413	0.492	0.253
Disorders of Immunity	0.003	0.054	0.003	0.053	0.003	0.055	0.780
Iron Deficiency and Anemias	0.020	0.138	0.021	0.142	0.018	0.134	0.238
Drug/Alcohol Abuse	0.010	0.098	0.014	0.119	0.005	0.067	**<.0001**
Personality Disorders	0.056	0.230	0.067	0.250	0.043	0.204	**<.0001**
Depression	0.007	0.084	0.010	0.098	0.004	0.066	**<.0001**
Anxiety Disorders	0.056	0.230	0.064	0.244	0.048	0.213	**<.0001**
Other Psychiatric Disorders	0.036	0.186	0.044	0.205	0.027	0.161	**<.0001**
Other Developmental Disability	0.001	0.034	0.001	0.037	0.001	0.029	0.279
Seizure Disorders Convulsions	0.007	0.084	0.009	0.093	0.006	0.074	**0.014**
Mononeuropathy, Neurological	0.080	0.271	0.081	0.274	0.077	0.267	0.325
Unstable Angina, Ischemic	0.010	0.097	0.010	0.101	0.009	0.093	0.243
Angina Pectoris/Old Myocardial	0.021	0.143	0.029	0.169	0.012	0.108	**<.0001**
Hypertensive Heart Disease	0.146	0.353	0.144	0.351	0.148	0.355	0.378
Other and Unspecified Heart	0.001	0.034	0.001	0.031	0.001	0.036	0.477
Cerebrovascular Disease	0.031	0.174	0.038	0.191	0.024	0.153	**<.0001**
Vascular Disease	0.015	0.123	0.018	0.133	0.012	0.111	**0.002**
Other Circulatory Disease	0.043	0.204	0.042	0.201	0.045	0.207	0.414
Chronic Obstructive Pulmonary	0.009	0.096	0.013	0.113	0.005	0.072	**<.0001**
Asthma	0.109	0.312	0.115	0.320	0.102	0.303	**0.005**
Other Lung Disorders	0.035	0.184	0.041	0.199	0.028	0.164	**<.0001**
Glaucoma	0.014	0.116	0.014	0.118	0.013	0.113	0.518
Cataract	0.029	0.168	0.031	0.174	0.027	0.162	0.099
Other Eye Disorders	0.664	0.472	0.619	0.486	0.715	0.451	**<.0001**
Significant Ear, Nose, Throat	0.003	0.057	0.002	0.046	0.004	0.067	**0.007**
Hearing Loss	0.142	0.349	0.145	0.352	0.138	0.345	0.199
Other Ear, Nose, Throat, Mouth	0.297	0.457	0.284	0.451	0.311	0.463	**0.000**
Urinary Obstruction Retention	0.027	0.163	0.028	0.166	0.027	0.161	0.502
Incontinence	0.015	0.121	0.014	0.117	0.016	0.125	0.307
Other Urinary Tract Disorders	0.017	0.127	0.016	0.127	0.017	0.128	0.853
Male Genital Disorders	0.003	0.053	0.002	0.048	0.003	0.057	0.259
Other Dermatological Disorders	0.037	0.188	0.035	0.183	0.039	0.193	0.186
Other Injuries	0.055	0.229	0.057	0.232	0.053	0.225	0.243
Major Abnormalities	0.004	0.066	0.005	0.069	0.004	0.062	0.332
Minor Symptoms, Signs	0.122	0.328	0.120	0.325	0.125	0.331	0.250

Table 2: Means for those admitted to hospital in the last 12 months by insurance and patient type

	Insured				Uninsured			
	Medicare 268		Private 948		Medicare 1,167		Private 156	
Variable	*Mean*	*Std Dev*	*Mean*	*Std Dev*	*Mean*	*Std Dev*	*Mean*	*Std Dev*
dge5	0.411	0.493	0.784	0.411	.	.	.	.
d2tolt5	0.072	0.259	0.079	0.270	.	.	.	.
d1tolt2	0.250	0.434	0.090	0.286	.	.	.	.
dlt1	0.267	0.443	0.047	0.212	.	.	.	.
age20lt30	0.114	0.319	0.087	0.282	0.233	0.423	0.112	0.316
age30lt40	0.280	0.450	0.203	0.402	0.188	0.391	0.161	0.369
age40lt50	0.182	0.387	0.158	0.365	0.124	0.330	0.126	0.333
age50lt60	0.191	0.394	0.155	0.363	0.102	0.303	0.077	0.267
age60lt65	0.051	0.220	0.085	0.279	0.068	0.252	0.028	0.165
age65lt75	0.102	0.303	0.171	0.377	0.127	0.333	0.091	0.288
agege75	0.076	0.266	0.134	0.341	0.138	0.345	0.406	0.493
female	0.597	0.491	0.618	0.486	0.617	0.486	0.490	0.502
married	0.686	0.465	0.667	0.472	0.472	0.499	0.399	0.491
children	0.818	1.176	0.624	1.055	0.773	1.162	0.399	0.806
tertiary	0.199	0.400	0.188	0.391	0.066	0.248	0.077	0.267
diploma	0.114	0.319	0.121	0.327	0.072	0.259	0.091	0.288
otherqual	0.263	0.441	0.240	0.428	0.254	0.436	0.217	0.414
incomek	1.064	0.676	0.975	0.695	0.579	0.378	0.651	0.555
concard	0.314	0.465	0.371	0.483	0.693	0.462	0.643	0.481
dvapen	0.013	0.112	0.009	0.097	0.026	0.158	0.196	0.398
dvawid	0.013	0.112	0.021	0.144	0.031	0.174	0.329	0.471
NSW	0.220	0.415	0.186	0.389	0.222	0.416	0.238	0.427
VIC	0.203	0.403	0.219	0.414	0.201	0.401	0.273	0.447
QLD	0.114	0.319	0.174	0.380	0.194	0.395	0.245	0.431
SA	0.110	0.314	0.115	0.320	0.121	0.326	0.049	0.217
WA	0.157	0.364	0.141	0.349	0.121	0.326	0.056	0.231
TAS	0.059	0.237	0.081	0.273	0.061	0.239	0.070	0.256
NT	0.025	0.158	0.015	0.123	0.018	0.134	0.007	0.084
ACT	0.110	0.314	0.067	0.250	0.062	0.242	0.063	0.244
capital	0.648	0.479	0.683	0.466	0.568	0.496	0.587	0.494
notcapurban	0.038	0.192	0.049	0.217	0.053	0.225	0.091	0.288
otherurban	0.275	0.448	0.220	0.415	0.335	0.472	0.273	0.447
rural	0.140	0.348	0.124	0.329	0.116	0.320	0.133	0.341
excellent	0.131	0.339	0.146	0.353	0.080	0.271	0.063	0.244
verygood	0.233	0.424	0.240	0.428	0.206	0.405	0.196	0.398
good	0.309	0.463	0.318	0.466	0.302	0.459	0.280	0.450
fair	0.220	0.415	0.212	0.409	0.236	0.425	0.280	0.450
poor	0.106	0.308	0.084	0.277	0.176	0.381	0.182	0.387
thin	0.085	0.279	0.066	0.248	0.097	0.296	0.105	0.307
normal	0.364	0.482	0.412	0.493	0.436	0.496	0.420	0.495
overweight	0.347	0.477	0.343	0.475	0.272	0.445	0.301	0.460
obese	0.203	0.403	0.179	0.384	0.195	0.397	0.175	0.381
exhigh	0.051	0.220	0.047	0.212	0.023	0.150	0.014	0.118
exmod	0.208	0.406	0.213	0.410	0.209	0.407	0.210	0.409
exlow	0.394	0.490	0.418	0.494	0.362	0.481	0.322	0.469
exsed	0.008	0.092	0.014	0.118	0.013	0.113	0.007	0.084
exno	0.339	0.474	0.307	0.462	0.393	0.489	0.448	0.499
Smoke	0.182	0.387	0.124	0.329	0.332	0.471	0.189	0.393
drinks	1.023	2.139	0.963	1.691	1.007	2.689	0.999	2.231

Table 2: continued

	Insured				Uninsured			
	Medicare 268		Private 948		Medicare 1,167		Private 156	
Variable	*Mean*	*Std Dev*	*Mean*	*Std Dev*	*Mean*	*Std Dev*	*Mean*	*Std Dev*
Other Infectious Diseases	0.017	0.129	0.015	0.123	0.017	0.131	0.021	0.144
Breast, Prostate, Colon Cancers	0.017	0.129	0.020	0.140	0.016	0.124	0.035	0.184
Other Neoplasms	0.042	0.202	0.031	0.172	0.040	0.197	0.084	0.278
Diabetes with No Complications	0.034	0.181	0.048	0.215	0.060	0.237	0.042	0.201
Type I Diabetes Mellitus	0.008	0.092	0.008	0.090	0.018	0.134	0.014	0.118
Other Endocrine/ disorders	0.106	0.308	0.112	0.315	0.106	0.309	0.154	0.362
Peptic Ulcer, Hemorrhage, etc	0.059	0.237	0.051	0.219	0.058	0.233	0.098	0.298
Other Gastrointestinal Disorders	0.081	0.273	0.125	0.331	0.107	0.310	0.175	0.381
Rheumatoid Arthritis, etc	0.047	0.211	0.059	0.236	0.060	0.237	0.133	0.341
Disorders of the Vertebrae, Spine	0.008	0.092	0.007	0.084	0.011	0.104	0.000	0.000
Osteoporosis, Bone/Cartilage	0.042	0.202	0.091	0.287	0.061	0.239	0.105	0.307
Other Musculoskeletal	0.466	0.500	0.492	0.500	0.500	0.500	0.636	0.483
Disorders of Immunity	0.008	0.092	0.005	0.069	0.006	0.074	0.014	0.118
Iron Deficiency and Anemias	0.042	0.202	0.031	0.172	0.045	0.207	0.035	0.184
Drug/Alcohol Abuse	0.017	0.129	0.006	0.077	0.018	0.134	0.021	0.144
Personality Disorders	0.068	0.252	0.067	0.250	0.102	0.303	0.091	0.288
Depression	0.004	0.065	0.005	0.069	0.010	0.100	0.007	0.084
Anxiety Disorders	0.064	0.244	0.053	0.224	0.086	0.281	0.105	0.307
Other Psychiatric Disorders	0.068	0.252	0.055	0.229	0.079	0.270	0.042	0.201
Other Developmental Disability	0.000	0.000	0.002	0.049	0.002	0.043	0.000	0.000
Seizure Disorders Convulsions	0.030	0.170	0.009	0.097	0.017	0.127	0.007	0.084
Mononeuropathy, Neurological	0.102	0.303	0.075	0.264	0.107	0.310	0.091	0.288
Unstable Angina, Ischemic	0.030	0.170	0.026	0.159	0.027	0.161	0.070	0.256
Angina Pectoris/Old Myocardial	0.025	0.158	0.039	0.193	0.069	0.253	0.154	0.362
Hypertensive Heart Disease	0.182	0.387	0.234	0.424	0.195	0.397	0.217	0.414
Other and Unspecified Heart	0.000	0.000	0.002	0.049	0.002	0.043	0.000	0.000
Cerebrovascular Disease	0.064	0.244	0.059	0.236	0.086	0.281	0.133	0.341
Vascular Disease	0.021	0.144	0.034	0.182	0.046	0.209	0.077	0.267
Other Circulatory Disease	0.047	0.211	0.073	0.260	0.062	0.242	0.042	0.201
Chronic Obstructive Pulmonary	0.025	0.158	0.007	0.084	0.030	0.171	0.049	0.217
Asthma	0.114	0.319	0.126	0.332	0.177	0.382	0.105	0.307
Other Lung Disorders	0.047	0.211	0.027	0.162	0.060	0.237	0.049	0.217
Glaucoma	0.021	0.144	0.021	0.144	0.018	0.134	0.056	0.231
Cataract	0.025	0.158	0.052	0.222	0.052	0.223	0.105	0.307
Other Eye Disorders	0.653	0.477	0.771	0.420	0.650	0.477	0.748	0.436
Significant Ear, Nose, Throat	0.008	0.092	0.002	0.049	0.003	0.052	0.007	0.084
Hearing Loss	0.182	0.387	0.203	0.402	0.172	0.378	0.315	0.466
Other Ear, Nose, Throat, Mouth	0.331	0.471	0.312	0.464	0.273	0.446	0.245	0.431
Urinary Obstruction Retention	0.055	0.229	0.047	0.212	0.048	0.213	0.049	0.217
Incontinence	0.055	0.229	0.027	0.162	0.021	0.144	0.042	0.201
Other Urinary Tract Disorders	0.047	0.211	0.021	0.144	0.029	0.169	0.035	0.184
Male Genital Disorders	0.004	0.065	0.007	0.084	0.006	0.074	0.007	0.084
Other Dermatological Disorders	0.042	0.202	0.042	0.202	0.032	0.176	0.042	0.201
Other Injuries	0.076	0.266	0.073	0.260	0.078	0.268	0.112	0.316
Major Abnormalities	0.004	0.065	0.001	0.034	0.007	0.085	0.014	0.118
Minor Symptoms, Signs	0.157	0.364	0.176	0.381	0.173	0.379	0.175	0.381

Table 3: Means and tests of difference between means for the insured and uninsured matched sub-samples

	Uninsured 9,366		Insured 8,328		Test of means
Variable	***Mean***	***Std Dev***	***Mean***	***Std Dev***	***P-value***
age20lt30	0.121	0.327	0.106	0.308	**0.004**
age30lt40	0.228	0.419	0.231	0.422	0.624
age40lt50	0.240	0.427	0.240	0.427	0.969
age50lt60	0.176	0.381	0.171	0.377	0.421
age60lt65	0.065	0.247	0.065	0.247	0.920
age65lt75	0.094	0.292	0.104	0.305	0.057
agege75	0.067	0.250	0.072	0.258	0.300
female	0.547	0.498	0.551	0.497	0.631
married	0.650	0.477	0.644	0.479	0.438
children	0.664	1.025	0.670	1.035	0.755
tertiary	0.196	0.397	0.194	0.396	0.803
diploma	0.122	0.327	0.112	0.315	0.054
otherqual	0.248	0.432	0.255	0.436	0.092
incomek	0.978	0.570	0.974	0.555	0.661
missoinc	0.196	0.397	0.199	0.400	0.562
concard	0.250	0.433	0.257	0.437	0.344
dvapen	0.009	0.093	0.010	0.102	0.271
dvawid	0.010	0.098	0.009	0.093	0.545
NSW	0.218	0.413	0.216	0.411	0.689
VIC	0.208	0.406	0.205	0.404	0.669
QLD	0.162	0.369	0.166	0.372	0.491
SA	0.112	0.316	0.115	0.319	0.568
WA	0.136	0.343	0.131	0.338	0.384
TAS	0.058	0.234	0.064	0.244	0.158
NT	0.016	0.124	0.015	0.121	0.688
ACT	0.089	0.285	0.087	0.282	0.749
capital	0.695	0.460	0.694	0.461	0.886
notcapurban	0.045	0.207	0.048	0.213	0.388
otherurban	0.203	0.402	0.208	0.406	0.403
rural	0.121	0.326	0.122	0.328	0.762
excellent	0.196	0.397	0.189	0.392	0.316
verygood	0.352	0.478	0.345	0.476	0.417
good	0.304	0.460	0.310	0.463	0.382
fair	0.118	0.323	0.122	0.328	0.463
poor	0.031	0.172	0.033	0.178	0.424
thin	0.068	0.252	0.067	0.250	0.768
normal	0.455	0.498	0.460	0.498	0.530
overweight	0.325	0.469	0.322	0.467	0.647
obese	0.152	0.359	0.151	0.358	0.945
missbmi	0.069	0.254	0.074	0.262	0.264
exhigh	0.063	0.242	0.061	0.239	0.632
exmod	0.252	0.434	0.258	0.438	0.427
exlow	0.407	0.491	0.400	0.490	0.392
exsed	0.011	0.102	0.009	0.097	0.509
exno	0.267	0.443	0.272	0.445	0.565
smokes	0.152	0.359	0.162	0.368	0.094
drinks	1.114	2.152	1.146	1.930	0.340
missalc	0.000	0.016	0.000	0.020	0.655

Table 3: continued

	Uninsured 9,366		Insured 8,328		Test of means
Variable	***Mean***	***Std Dev***	***Mean***	***Std Dev***	***P-value***
Other Infectious Diseases	0.010	0.100	0.011	0.105	0.520
Breast, Prostate, Colon Cancers	0.004	0.059	0.005	0.073	0.106
Other Neoplasms	0.016	0.126	0.017	0.129	0.697
Diabetes with No Complications	0.032	0.175	0.029	0.168	0.388
Type I Diabetes Mellitus	0.006	0.075	0.005	0.073	0.825
Other Endocrine/ disorders	0.084	0.278	0.085	0.279	0.882
Peptic Ulcer, Hemorrhage, etc	0.031	0.172	0.034	0.182	0.194
Other Gastrointestinal Disorders	0.073	0.260	0.078	0.269	0.213
Rheumatoid Arthritis, etc	0.028	0.164	0.031	0.174	0.206
Disorders of the Vertebrae, Spine	0.006	0.079	0.006	0.078	0.916
Osteoporosis, Bone/Cartilage	0.033	0.179	0.034	0.182	0.648
Other Musculoskeletal	0.403	0.491	0.418	0.493	0.082
Disorders of Immunity	0.003	0.051	0.003	0.053	0.752
Iron Deficiency and Anemias	0.016	0.126	0.019	0.136	0.186
Drug/Alcohol Abuse	0.003	0.058	0.005	0.071	0.127
Personality Disorders	0.046	0.210	0.046	0.209	0.875
Depression	0.003	0.053	0.005	0.068	0.097
Anxiety Disorders	0.047	0.212	0.049	0.216	0.590
Other Psychiatric Disorders	0.026	0.159	0.027	0.163	0.682
Other Developmental Disability	0.001	0.029	0.001	0.026	0.763
Seizure Disorders Convulsions	0.005	0.071	0.006	0.079	0.322
Mononeuropathy, Neurological	0.075	0.264	0.078	0.268	0.536
Unstable Angina, Ischemic	0.009	0.094	0.009	0.094	0.930
Angina Pectoris/Old Myocardial	0.015	0.120	0.013	0.114	0.481
Hypertensive Heart Disease	0.145	0.352	0.149	0.356	0.471
Other and Unspecified Heart	0.001	0.029	0.001	0.037	0.317
Cerebrovascular Disease	0.025	0.157	0.026	0.161	0.640
Vascular Disease	0.012	0.109	0.013	0.112	0.655
Other Circulatory Disease	0.045	0.208	0.046	0.209	0.874
Chronic Obstructive Pulmonary	0.004	0.066	0.006	0.076	0.203
Asthma	0.097	0.296	0.103	0.304	0.272
Other Lung Disorders	0.029	0.168	0.029	0.169	0.845
Glaucoma	0.011	0.104	0.013	0.115	0.175
Cataract	0.025	0.157	0.028	0.165	0.331
Other Eye Disorders	0.704	0.457	0.701	0.458	0.679
Significant Ear, Nose, Throat	0.002	0.044	0.004	0.060	**0.042**
Hearing Loss	0.136	0.342	0.140	0.347	0.444
Other Ear, Nose, Throat, Mouth	0.309	0.462	0.306	0.461	0.721
Urinary Obstruction Retention	0.023	0.149	0.026	0.161	0.151
Incontinence	0.015	0.122	0.016	0.125	0.689
Other Urinary Tract Disorders	0.015	0.123	0.017	0.129	0.513
Male Genital Disorders	0.003	0.055	0.003	0.057	0.768
Other Dermatological Disorders	0.036	0.187	0.038	0.192	0.460
Other Injuries	0.052	0.223	0.054	0.225	0.713
Major Abnormalities	0.003	0.053	0.004	0.065	0.165
Minor Symptoms, Signs	0.118	0.322	0.123	0.329	0.299

Table 4: Probability of Medicare admission, conditional length of stay conditional and unconditional length of stay by time in cover for the original and matched samples

	Matched		Original			Matched		Original			Matched		Original	
Variable	Mean	Std Dev	Mean	Std Dev	Variable	Mean	Std Dev	Mean	Std Dev	Variable	Mean	Std Dev	Mean	Std Dev
p0	0.087	0.004	0.108	0.003	losp0	2.841	3.589	2.930	0.247	unc_los0	0.254	0.099	0.315	0.028
plt1	0.076	0.010	0.091	0.009	loslt1	2.672	4.237	2.806	0.983	unc_loslt1	0.205	0.148	0.253	0.103
p1tolt2	0.055	0.010	0.069	0.009	los1tolt2	3.221	3.988	3.618	0.749	unc_los1tolt2	0.180	0.126	0.246	0.072
p2tolt5	0.039	0.010	0.045	0.010	los2tolt5	3.763	4.406	3.727	2.317	unc_los2tolt5	0.145	0.139	0.163	0.136
pge5	0.021	0.003	0.024	0.002	losge5	2.944	3.829	2.902	0.596	unc_losge5	0.063	0.034	0.068	0.020

Table 5: Probability of private admission, conditional length of stay conditional and unconditional length of stay by time in cover for the original and matched samples

	Matched		Original			Matched		Original			Matched		Original	
Variable	Mean	Std Dev	Mean	Std Dev	Variable	Mean	Std Dev	Mean	Std Dev	Variable	Mean	Std Dev	Mean	Std Dev
p0	0.015	0.002	0.015	0.001	losp0	2.899	1.599	2.556	1.036	unc_los0	0.044	0.023	0.047	0.027
plt1	0.058	0.009	0.058	0.008	loslt1	2.426	2.831	2.521	2.181	unc_loslt1	0.161	0.148	0.143	0.138
p1tolt2	0.094	0.010	0.089	0.009	los1tolt2	3.159	2.178	3.159	1.442	unc_los1tolt2	0.317	0.162	0.282	0.186
p2tolt5	0.171	0.021	0.169	0.016	los2tolt5	4.287	2.776	4.227	1.752	unc_los2tolt5	0.744	0.451	0.704	0.346
pge5	0.142	0.006	0.140	0.006	losge5	3.393	1.599	3.517	1.257	unc_losge5	0.525	0.165	0.469	0.241

Figure 3: Probability of Medicare admission, conditional length of stay and unconditional length of stay by duration of supplementary cover

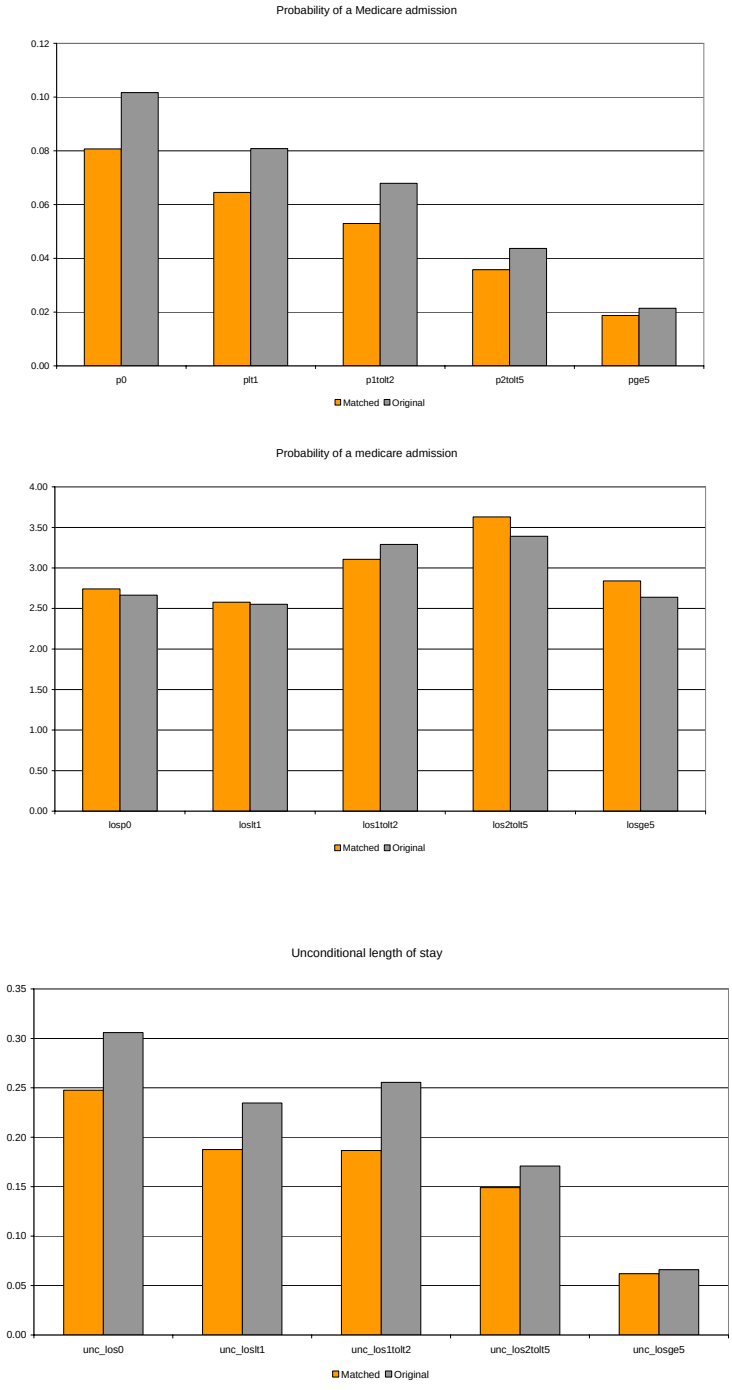
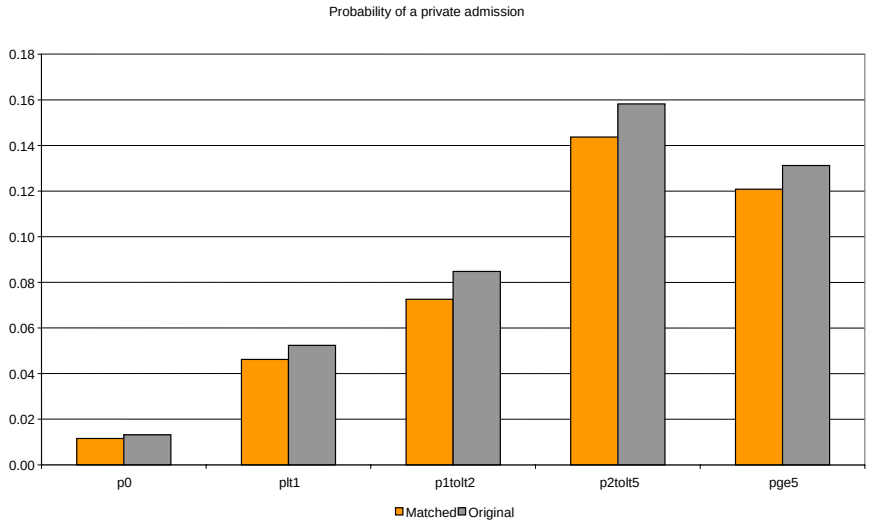
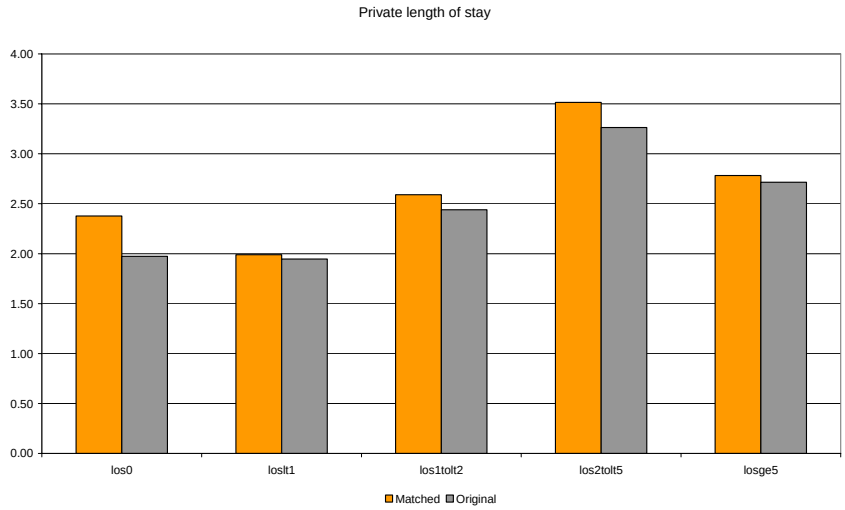


Figure 4: Probability of Private admission, conditional length of stay and unconditional length of stay by duration of supplementary cover





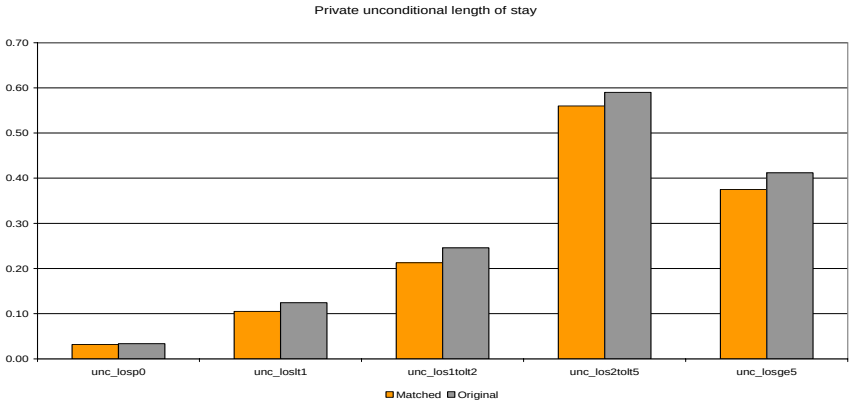


Table 6: Overall predicted impact on hospital use

Unconditional length of stay

	Medicare		Private		Total	
Insurance status	LOS	Change	LOS	Change	LOS	Change
Not insured	0.254		0.044		0.298	
Less than 1 year	0.205	-0.048	0.161	0.117	0.366	0.069
1 to 2 years	0.180	-0.074	0.317	0.273	0.497	0.199
2 to 5 years	0.145	-0.109	0.744	0.700	0.889	0.591
5 or more years	0.063	-0.191	0.525	0.481	0.588	0.290

Probability of admission

	Medicare		Private		Total	
Insurance status	Prob	Change	Prob	Change	Prob	Change
Not insured	8.7%		1.5%		10.2%	
Less than 1 year	7.6%	-1.1%	5.8%	4.3%	13.4%	3.2%
1 to 2 years	5.5%	-3.2%	9.4%	7.9%	14.9%	4.7%
2 to 5 years	3.9%	-4.9%	17.1%	15.6%	21.0%	10.7%
5 or more years	2.1%	-6.6%	14.2%	12.7%	16.3%	6.1%

Table A1: MNL model results for matched sample

	Medicare admission				Private admission			
Parameter	*Estimate*	*Odds*	*Lower*	*Upper*	*Estimate*	*Odds*	*Lower*	*Upper*
Intercept	-4.545**				-2.757 **			
noins	1.361**	3.90	3.14	4.85	-2.410 **	0.09	0.07	0.11
dlt1	1.266**	3.55	2.56	4.91	-0.963 **	0.38	0.28	0.53
d1tolt2	0.952**	2.59	1.84	3.65	-0.500 **	0.61	0.47	0.78
d2tolt5	0.696**	2.01	1.19	3.39	0.291 **	1.34	1.01	1.78
age30lt40	-0.349**	0.71	0.55	0.91	-0.072	0.93	0.70	1.23
age40lt50	-0.712**	0.49	0.37	0.65	-0.539 **	0.58	0.43	0.79
age50lt60	-0.544**	0.58	0.42	0.79	-0.481 **	0.62	0.45	0.86
age60lt65	-0.672**	0.51	0.34	0.77	-0.401 *	0.67	0.45	1.01
age65lt75	-0.536**	0.59	0.39	0.88	-0.053	0.95	0.63	1.42
agege75	-0.590**	0.55	0.35	0.87	0.019	1.02	0.66	1.57
female	0.027	1.03	0.86	1.23	0.150 *	1.16	0.97	1.39
married	0.033	1.03	0.86	1.24	0.055	1.06	0.88	1.26
children	0.181**	1.20	1.10	1.30	0.083 *	1.09	0.99	1.19
EmployPT	-0.013	0.99	0.79	1.24	0.326 **	1.39	1.11	1.73
Unemp	0.257	1.29	0.76	2.20	0.361	1.43	0.78	2.65
NotinLF	0.389**	1.48	1.16	1.88	0.491 **	1.63	1.29	2.07
study	-0.124	0.88	0.67	1.16	-0.186	0.83	0.62	1.12
incomek	0.174	1.19	0.73	1.95	-0.159	0.85	0.56	1.30
incuksq	-0.108	0.90	0.76	1.06	0.096	1.10	0.97	1.26
missuinc	-0.191*	0.83	0.67	1.01	0.022	1.02	0.85	1.23
concard	0.158	1.17	0.92	1.49	-0.232 *	0.79	0.63	1.00
dvapen	-0.236	0.79	0.38	1.65	-0.330	0.72	0.38	1.35
dvawid	-0.302	0.74	0.35	1.55	1.104 **	3.02	1.82	5.00
VIC	0.010	1.01	0.81	1.26	0.194 *	1.21	0.97	1.52
QLD	-0.173	0.84	0.66	1.07	0.275 **	1.32	1.04	1.66
SA	-0.032	0.97	0.74	1.27	0.195	1.22	0.93	1.58
WA	0.167	1.18	0.92	1.52	0.228 *	1.26	0.98	1.62
TAS	-0.451**	0.64	0.45	0.91	0.180	1.20	0.87	1.65
NT	-0.963**	0.38	0.17	0.84	0.237	1.27	0.69	2.33
ACT	0.553**	1.74	1.31	2.30	0.101	1.11	0.81	1.51
notcapurban	-0.161	0.85	0.58	1.26	-0.121	0.89	0.62	1.26
otherurban	0.546**	1.73	1.43	2.08	0.037	1.04	0.86	1.26
rural	0.279**	1.32	1.05	1.67	0.081	1.08	0.86	1.36
verygood	0.282**	1.33	1.04	1.69	-0.049	0.95	0.76	1.20
good	0.408**	1.50	1.17	1.94	0.228 *	1.26	1.00	1.58
fair	0.768**	2.16	1.61	2.89	0.612 **	1.84	1.41	2.42
poor	1.293**	3.64	2.49	5.32	0.928 **	2.53	1.73	3.69
thin	0.176	1.19	0.89	1.59	0.081	1.08	0.81	1.45
overweight	0.132	1.14	0.95	1.37	0.110	1.12	0.94	1.33
obese	0.325**	1.38	1.12	1.71	0.116	1.12	0.90	1.40
missbmi	-0.038	0.96	0.71	1.30	-0.236	0.79	0.58	1.08
Smoke	-0.036	0.96	0.78	1.19	-0.005	1.00	0.80	1.23
drinks	-0.018	0.98	0.94	1.02	-0.002	1.00	0.96	1.04
missalc	-9.155	<0.001	<0.001	>999.999	-9.883	<0.001	<0.001	>999.999
exhigh	0.008	1.01	0.71	1.44	0.086	1.09	0.78	1.53
exmod	0.014	1.01	0.84	1.23	-0.174 *	0.84	0.70	1.01
exsed	0.456	1.58	0.87	2.87	0.427	1.53	0.80	2.94
exno	0.106	1.11	0.93	1.33	0.027	1.03	0.86	1.22

Table A1: continued

	Medicare admission				Private admission			
Parameter	*Estimate*		*Odds*	*Lower*	*Upper*	*Estimate*	*Odds*	*Lower*	*Upper*
tertiary	0.034		1.04	0.82	1.31	-0.024	0.98	0.78	1.22
diploma	0.244	**	1.28	1.00	1.63	0.076	1.08	0.85	1.37
otherqual	0.199	**	1.22	1.02	1.47	0.039	1.04	0.87	1.25
missqual	0.694	**	2.00	1.37	2.93	0.086	1.09	0.67	1.77
bornaust	0.007		1.01	0.84	1.20	0.135	1.15	0.96	1.37
Other Infectious Diseases	0.000		1.00	0.53	1.88	0.598	** 1.82	1.05	3.13
Breast, Prostate, Colon Cancers	1.217	**	3.38	1.59	7.15	1.238	** 3.45	1.78	6.69
Other Neoplasms	0.527	**	1.69	1.09	2.64	0.380	* 1.46	0.95	2.26
Diabetes with No Complications	0.048		1.05	0.73	1.51	-0.111	0.90	0.62	1.29
Type I Diabetes Mellitus	1.154	**	3.17	1.70	5.91	0.479	1.62	0.73	3.57
Other Endocrine/ disorders	-0.063		0.94	0.73	1.21	0.001	1.00	0.78	1.28
Peptic Ulcer, Hemorrhage, etc	0.246		1.28	0.92	1.79	0.128	1.14	0.81	1.60
Gastrointestinal Disorders	0.159		1.17	0.91	1.50	0.381	** 1.46	1.16	1.84
Rheumatoid Arthritis, etc	0.241		1.27	0.89	1.82	0.456	** 1.58	1.14	2.18
Disorders of the Vertebrae, Spine	0.650	*	1.92	0.99	3.71	0.056	1.06	0.46	2.44
Osteoporosis, Bone/Cartilage	0.438	**	1.55	1.12	2.14	0.497	** 1.64	1.22	2.22
Other Musculoskeletal	0.074		1.08	0.92	1.26	0.035	1.04	0.89	1.21
Disorders of Immunity	0.760		2.14	0.82	5.60	0.586	1.80	0.64	5.04
Iron Deficiency and Anemias	0.824	**	2.28	1.53	3.40	0.324	1.38	0.88	2.17
Drug/Alcohol Abuse	0.110		1.12	0.43	2.87	0.294	1.34	0.56	3.24
Personality Disorders	-0.166		0.85	0.60	1.19	0.376	** 1.46	1.06	2.01
Depression	0.110		1.12	0.39	3.24	-0.117	0.89	0.30	2.68
Anxiety Disorders	0.075		1.08	0.78	1.49	-0.242	0.79	0.56	1.11
Other Psychiatric Disorders	0.924	**	2.52	1.83	3.47	0.782	** 2.19	1.55	3.08
Other Developmental Disability	0.179		1.20	0.13	10.89	0.906	2.47	0.41	14.99
Seizure Disorders Convulsions	0.847	**	2.33	1.21	4.49	0.418	1.52	0.72	3.20
Mononeuropathy, Neurological	0.172		1.19	0.92	1.53	0.110	1.12	0.86	1.45
Unstable Angina, Ischemic	0.508	*	1.66	0.95	2.92	0.622	** 1.86	1.09	3.18
Angina Pectoris/Old Myocardial	0.617	**	1.85	1.19	2.88	0.416	* 1.52	0.96	2.39
Hypertensive Heart Disease	0.275	**	1.32	1.06	1.63	0.142	1.15	0.94	1.41
Unspecified Heart Disease	0.120		1.13	0.23	5.63	-0.06	0.94	0.17	5.11

Table A1: continued

	Medicare admission				Private admission			
Parameter	*Estimate*	*Odds*	*Lower*	*Upper*	*Estimate*	*Odds*	*Lower*	*Upper*
Vascular Disease	0.697 **	2.01	1.24	3.27	0.568 **	1.76	1.11	2.81
Other Circulatory Disease	-0.170	0.84	0.61	1.18	0.135	1.15	0.85	1.55
Chronic Obstructive Pulmonary Disease	-0.047	0.95	0.43	2.12	-0.893 *	0.41	0.16	1.04
Asthma	0.135	1.14	0.91	1.43	0.140	1.15	0.92	1.44
Other Lung Disorders	0.244	1.28	0.89	1.83	-0.228	0.80	0.52	1.21
Glaucoma	0.211	1.23	0.70	2.17	0.020	1.02	0.60	1.74
Cataract	0.224	1.25	0.85	1.85	0.019	1.02	0.71	1.46
Other Eye Disorders	-0.243 **	0.78	0.65	0.95	0.040	1.04	0.86	1.26
Significant Ear, Nose, and Throat Disorders	-0.174	0.84	0.27	2.64	-0.775	0.46	0.13	1.62
Hearing Loss	-0.051	0.95	0.77	1.18	0.137	1.15	0.94	1.40
Other Ear, Nose, Throat, and Mouth Disorders	-0.179 **	0.84	0.71	0.98	-0.082	0.92	0.79	1.08
Urinary Obstruction and Retention	0.112	1.12	0.75	1.68	0.283	1.33	0.92	1.91
Incontinence	0.130	1.14	0.72	1.80	-0.077	0.93	0.58	1.47
Other Urinary Tract Disorders	0.784 **	2.19	1.44	3.34	-0.086	0.92	0.54	1.55
Male Genital Disorders	-0.353	0.70	0.16	3.13	0.361	1.44	0.52	3.96
Other Dermatological Disorders	0.438 **	1.55	1.13	2.13	-0.014	0.99	0.69	1.41
Other Injuries	0.389 **	1.48	1.12	1.94	0.360 **	1.43	1.09	1.89
Major Symptoms, Abnormalities	0.222	1.25	0.48	3.25	-1.067	0.34	0.08	1.55
Minor Symptoms, Signs, Findings	0.059	1.06	0.86	1.31	0.066	1.07	0.87	1.31

Table A2: Log length of stay regressions for the matched sample

	Medicare			Private		
Variable	Estimate	StdErr	P-value	Estimate	Error	P-value
Intercept	**0.943**	**0.265**	**0.000**	**1.102**	**0.237**	**<.0001**
noins	-0.036	0.103	0.729	-0.157	0.115	0.171
dlt1	-0.097	0.152	0.524	**-0.335**	**0.154**	**0.030**
d1tolt2	0.090	0.154	0.559	-0.071	0.120	0.550
d2tolt5	0.245	0.247	0.321	0.234	0.124	0.059
age30lt40	0.159	0.117	0.173	-0.038	0.123	0.755
age40lt50	0.079	0.132	0.550	-0.222	0.132	0.094
age50lt60	0.266	0.146	0.068	0.161	0.152	0.289
age60lt65	0.218	0.190	0.251	-0.126	0.181	0.484
age65lt75	**0.407**	**0.181**	**0.025**	-0.180	0.178	0.310
agege75	**0.660**	**0.195**	**0.001**	0.103	0.192	0.594
female	0.095	0.085	0.265	0.113	0.079	0.153
married	0.089	0.085	0.298	-0.085	0.079	0.280
children	**0.099**	**0.041**	**0.016**	0.072	0.042	0.086
EmployPT	-0.031	0.111	0.783	-0.058	0.103	0.576
Unemp	-0.417	0.238	0.081	0.036	0.266	0.893
NotinLF	-0.092	0.111	0.409	0.190	0.103	0.064
study	0.087	0.128	0.500	0.155	0.136	0.258
incomek	-0.381	0.259	0.142	**-0.523**	**0.183**	**0.004**
incuksq	0.091	0.092	0.323	**0.191**	**0.056**	**0.001**
missuinc	-0.106	0.094	0.258	0.033	0.083	0.689
concard	-0.023	0.110	0.832	-0.095	0.101	0.347
dvapen	-0.547	0.314	0.082	0.115	0.264	0.662
dvawid	0.602	0.323	0.063	0.166	0.196	0.396
VIC	**0.199**	**0.100**	**0.048**	-0.066	0.100	0.510
QLD	0.169	0.114	0.140	-0.077	0.106	0.470
SA	0.129	0.122	0.290	-0.102	0.120	0.398
WA	**0.238**	**0.113**	**0.035**	-0.185	0.114	0.105
TAS	0.145	0.152	0.341	-0.024	0.137	0.864
NT	-0.139	0.350	0.691	-0.059	0.259	0.819
ACT	**0.279**	**0.130**	**0.033**	0.143	0.145	0.323
notcapurban	0.028	0.174	0.872	0.232	0.154	0.131
otherurban	**-0.273**	**0.083**	**0.001**	-0.025	0.086	0.769
rural	-0.122	0.104	0.240	-0.013	0.101	0.900
Other Infectious Diseases	0.384	0.266	0.149	**0.675**	**0.227**	**0.003**
Breast, Prostate, Colon cancer	-0.256	0.278	0.356	-0.183	0.240	0.447
Other Neoplasms	0.129	0.183	0.480	0.150	0.177	0.395
Diabetes No Complications	0.303	0.160	0.058	0.217	0.154	0.160
Type I Diabetes Mellitus	0.173	0.273	0.527	0.301	0.349	0.389
Other Endocrine/ Metabolic/	0.145	0.117	0.218	0.035	0.113	0.758
Peptic Ulcer, Haemorrhage, Specified Gastrointestinal	-0.244	0.154	0.114	-0.254	0.145	0.080
Other Gastrointestinal s	0.119	0.113	0.291	-0.115	0.098	0.241
Rheumatoid Arthritis,etc Connective Tissue Disease	0.008	0.146	0.954	-0.039	0.129	0.764
Disorders of Vertebrae Spine	-0.319	0.275	0.247	0.483	0.380	0.203
Osteoporosis Bone/Cartilage	-0.028	0.137	0.837	0.176	0.121	0.146
Other Musculoskeletal	0.038	0.073	0.605	0.056	0.068	0.413
Disorders of Immunity	-0.510	0.398	0.201	-0.649	0.408	0.112
Iron Deficiency and Anaemia	**0.384**	**0.169**	**0.023**	-0.043	0.193	0.823

	Medicare			Private		
Variable	Estimate	StdErr	P-value	Estimate	Error	P-value
Drug/Alcohol Abuse	-0.001	0.372	0.998	0.409	0.358	0.254
Personality Disorders	-0.063	0.155	0.687	0.230	0.141	0.103
Depression	0.186	0.518	0.720	0.164	0.476	0.731
Anxiety Disorders	-0.252	0.149	0.092	-0.053	0.149	0.722
Other Psychiatric Disorders	0.174	0.133	0.190	-0.022	0.136	0.874
Developmental Disability	-0.156	0.924	0.866	-0.951	0.641	0.138
Seizure Convulsions	-0.027	0.252	0.914	-0.156	0.314	0.618
Mononeuropathy, Neurological	-0.105	0.122	0.388	0.034	0.117	0.773
Unstable Angina and Ischemic	-0.258	0.229	0.260	0.167	0.201	0.408
Angina Pectoris/Old MCI	-0.159	0.175	0.363	0.074	0.178	0.678
Hypertensive Heart Disease	0.149	0.094	0.116	-0.128	0.088	0.143
Other and Unspecified Heart Disease	-0.815	0.936	0.385	-0.850	0.644	0.188
Cerebrovascular Unspecified	0.260	0.144	0.072	0.125	0.143	0.381
Vascular Disease	0.107	0.187	0.566	-0.100	0.182	0.581
Other Circulatory Disease	0.052	0.146	0.724	**0.292**	**0.128**	**0.023**
COPD	0.242	0.311	0.437	-0.170	0.379	0.654
Asthma	-0.072	0.102	0.476	**0.236**	**0.101**	**0.019**
Other Lung Disorders	-0.023	0.163	0.886	-0.286	0.189	0.130
Glaucoma	-0.038	0.237	0.871	0.197	0.229	0.390
Cataract	-0.117	0.172	0.496	-0.143	0.152	0.350
Other Eye Disorders	-0.004	0.086	0.965	**0.188**	**0.089**	**0.035**
Significant Ear, Nose, Throat	**-1.311**	**0.497**	**0.009**	**1.518**	**0.645**	**0.019**
Hearing Loss	-0.049	0.098	0.620	-0.063	0.085	0.455
Other Ear, Nose, Throat Mouth	-0.046	0.073	0.526	**-0.187**	**0.070**	**0.008**
Urinary Obstruction n	0.098	0.174	0.574	-0.165	0.160	0.304
Incontinence	-0.211	0.199	0.288	0.167	0.195	0.393
Other Urinary Tract Disorders	**-0.362**	**0.180**	**0.045**	**0.469**	**0.226**	**0.038**
Male Genital Disorders	-0.254	0.922	0.783	-0.221	0.388	0.569
Other Dermatological	0.003	0.150	0.985	-0.001	0.153	0.996
Other Injuries	0.103	0.122	0.399	-0.051	0.120	0.673
Major Abnormalities	-0.183	0.468	0.696	0.663	0.678	0.329
Minor Symptoms, Signs,	-0.083	0.097	0.391	-0.062	0.089	0.485
verygood	-0.199	0.113	0.079	-0.046	0.107	0.668
good	-0.137	0.118	0.249	0.071	0.106	0.505
fair	-0.248	0.132	0.060	**0.329**	**0.121**	**0.007**
poor	0.215	0.158	0.174	0.288	0.160	0.073
thin	0.207	0.132	0.118	0.106	0.130	0.417
overweight	-0.082	0.082	0.319	0.101	0.077	0.189
obese	**-0.189**	**0.093**	**0.042**	0.082	0.096	0.397
missbmi	-0.081	0.134	0.547	**0.293**	**0.140**	**0.037**
Smoke	-0.024	0.092	0.794	-0.174	0.098	0.076
drinks	0.003	0.013	0.804	**-0.045**	**0.020**	**0.023**
exhigh	-0.142	0.180	0.429	0.052	0.159	0.746
exmod	-0.154	0.088	0.080	0.017	0.085	0.843
exsed	-0.246	0.257	0.339	0.423	0.266	0.113
exno	-0.027	0.079	0.729	0.008	0.077	0.921
tertiary	-0.047	0.109	0.669	0.107	0.098	0.271
diploma	-0.205	0.110	0.063	0.137	0.105	0.192
otherqual	-0.086	0.083	0.301	0.043	0.082	0.599
missqual	0.227	0.176	0.197	-0.363	0.209	0.083
bornaust	**0.176**	**0.080**	**0.029**	-0.085	0.076	0.264

CHERE
CENTRE FOR HEALTH ECONOMICS
RESEARCH AND EVALUATION

UNIVERSITY OF
TECHNOLOGY SYDNEY