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Out-of-pocket health expenditures in Australia: a semi-parametric analysis

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Abstract
Out-of-pocket health expenditures in Australia are high in international comparisons and have been growing at a faster rate than most other health costs in recent years. This raises concerns about the extent to which out-of-pocket costs have constrained access to health services for low income households. Using data from the ABS Household Expenditure Survey 2003-04, we model the relationships between health expenditure shares and equivalised total expenditure for categories of out-of-pocket health expenditures and analyse the extent of protection given by concession cards. To allow for flexibility in the relationship we adopt a semi-parametric estimation technique following Yatchew (1997). We find mixed evidence for the protection health concession cards give against high out-of-pocket health expenditures. Despite higher levels of subsidy, households with concession cards have higher total health expenditure shares than other households. Surprisingly, the major drivers of the difference are not categories of expenditure where cards offer little or no protection, such as dental services and non-prescription medicines, but prescriptions costs, where concession cards guarantee a subsidy, and specialist consultations, where bulk billing rates would be expected to be higher for cardholders. This is the first detailed distributional analysis of household health expenditures in Australia.

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1. Introduction

The unpredictable nature of adverse health events and the highly skewed distribution of health care expenditures make self insurance largely infeasible. As a result every OECD health system is financed through a mix of tax-financed public insurance, private insurance and out-of-pocket (OOP) payments. The mix of funding sources has an important bearing on the equity of the system. For example, a major reliance on financing health care through OOP payments is likely to disadvantage lower income households because patient's ability to access the system is constrained by their ability to pay for health care. It may also result in horizontal inequity in relation to health status (Wagstaff and van Doorslaer, 2000). Given the well-established empirical relationship between income and health, poorer sections of the community are likely to need relatively more health care than those on higher incomes and face higher burdens from OOP payments.

By international standards, Australia has a heavy reliance on OOP payments to finance its health care. This is despite Medicare which gives universal access to free or subsidised health care services and products. Figure 1 shows international comparisons of per capita OOP payments devoted to health care in 2002. For comparative purposes, national currencies are converted to USD using the OECD's purchasing power parity (PPP) exchange rate. Out of the 28 OECD member countries for which data are available, Australia ranks fourth highest in per capita OOP costs (OECD, 2006).

In 2003-04, $75.8 billion or 9.7% of the Australia's GDP was devoted to health care, and over the previous ten years health expenditure increased by an average of 4.6% per annum. Figure 2 shows that over the last decade OOP payments have grown more rapidly than any other source of health care funding (AIHW, 2005). Australians are spending more on their health care and are increasingly financing this expenditure through OOP payments. Aggregate statistics indicate that in 2003-04 the proportion of recurrent health expenditure financed through OOP payments was 21.4%, about three times the private health insurance share. The Australian government funded 46.5% of total health expenditure and state and local government, 20.3%. The OOP component represents about $810 per capita with the largest proportions going towards non-prescription pharmaceuticals and dental health services (AIHW 2005, Table S38). Not surprisingly, both of these areas of expenditure are characterised by a lack of a publicly funded programs.

The Australian health care system is characterised by mix of services and products some provided free of charge, some at very little charge and some at full cost. Apart from public hospitals, health care services are to a large extent privately provided and paid for on a fee-for-service basis. Private providers have the right to determine their own fees. In the presence of a tax funded system, this could be a recipe for escalating public health care costs. However, the Australian government has controlled demand by setting fixed subsidies for medical services and has put in place several restrictions on what medicines and procedures it subsidies and how much it pays for them.

There is an enormous degree of complexity around who gets charged for what service or product. For example, some GPs seek zero patient contributions for all their services, some GPs charge a patient contribution for all their services and some GPs charge some of their patients. Specialists are far less likely to bulk bill than GPs. This complexity means that all Australians face a substantial risk of being charged OOP costs for their health care however the level of OOPs depends not so much on the amount of health care purchased but the type of service and its location. To counter this risk, some additional measures have been put in place to protect individuals and households from high OOP costs. Eligible Australians can apply for a range of concession cards that entitle them to higher government subsidies for some medical services and products. Concession cards are an essential part of these protective measures because they provide additional subsidies for the most vulnerable groups in society, those on low incomes, the elderly or people with a disability or with special needs.

To date, there has been very little research and analysis of the distribution of OOP costs in Australia. Most government agencies focus their reporting on aggregate measures such as the percentage of services with zero OOP costs over time, by profession and by region (Australian Department of Health and Aged Care, 2000; Britt, Valenti et al. 2001; Australian Institute of Health and Welfare. 2005; Australian Institute of Health and Welfare. 2006). Of fifteen studies that analysed OOP costs in Australia published between 1990 and 2006, nine focused on OOP costs associated with particular diseases, such as stroke or childhood cancer (Fan, Boldy et al. 1997; March and Bachmeier 1997; Lapsley, March et al. 2001; Jenner, Campbell et al. 2002; March, Cross et al. 2002; Cohn, Goodenough et al. 2003; Hall and Hendrie 2003; Dewey, Thrift et al. 2004; March, Cross et al. 2004). Four studies examined the OOP costs associated with GP consultations, including one study that examined costs for different income groups (Young, Dobson et al. 2000; Young, Dobson et al. 2001; Arnold 2003; Young and Dobson 2003). One study estimated the personal cost of attending breast screening services and another surveyed patients about the extent to which prescription co-payments imposed a barrier to access (Hurley and Livingston 1991; Doran, Robertson et al. 2004).

This is the first Australian study to examine how health-related OOP costs vary across the distribution of household total expenditure and the extent to which concession cards provide protection from OOP costs. Section 2 of the paper describes the institutional health care arrangements in Australia and the eligibility conditions and entitlements of health care concession cards. Using data from the ABS Household Expenditure Survey 2003-04, we model the relationships between health expenditure shares and per capita total expenditure. To allow for flexibility in the relationship we adopt a semi-parametric estimation technique following Yatchew (1997). The model and empirical strategy are outlined in section 3 and in section 4 we describe the data. Results are presented in section 5 and section 6 concludes.

2. Policy setting

The Australian health care system involves a complex set of arrangements and interactions between the public and private sectors. Government health policy objectives include the provision of tax-financed medical services, medicines and acute health care for all Australians under Medicare and a commitment

to a viable private health industry to improve the choice of health services for Australians. (Commonwealth Department of Health and Ageing, 2003-04) The Australian Government has responsibility for medical services and pharmaceutical benefits. The State and Territory governments own and operate public hospitals; however, there is a significant Commonwealth contribution to public hospital operating costs, negotiated through five yearly Australian Health Care Agreements.

All Australian residents are entitled to free public hospital treatment anywhere in Australia. Public patients treated in public hospitals forego choice of medical provider and are treated by specialists paid by the hospital. Specialists may be private practitioners, paid on a sessional (or hourly) basis for treatment of public patients, or salaried staff specialists. Most private patients are admitted to private hospitals but specialists treating public patients can also admit private patients in public hospitals.

Apart from doctors treating public inpatients, most medical services are provided by private practitioners paid on a fee-for-service basis. Doctors set their own fee for each medical service provided, and the Australian Government effectively sets a floor price through the Medical Benefits Schedule (MBS) via a fixed rate of subsidy. In 2003-04 the government reimbursed doctors at 75% of the MBS fee for private inpatient services whether in a public or private hospital, and 85% for out-of-hospital services. If doctors accept the government reimbursement as the full fee the patient incurs no OOP charge. This is known as bulk billing. If the practitioner does not bulk bill, any charge above the MBS reimbursement is charged to the patient. OOP payments for doctor visits vary by area of residence and medical specialty. At the end of 2003, 66% of GP visits were bulk-billed, with the lowest rate in the ACT (34%) and the highest in NSW (75%). Most patients incur an OOP cost for specialist consultations. For example, bulk-billing rates in December 2003 were 27% for specialist consultations, 10% for anaesthetics, 41% for operations and 20% for obstetrics. There was also a Medicare Safety Net which paid 100% of the Medicare fee schedule (as opposed to the normal 85%) when families' annual aggregate gap payment (the difference between the schedule fee and amount charged) exceeded a threshold. A number of new bulk billing incentives were implemented in 2003-04: MedicarePlus provided higher payments (an increase from $5 to $7.50) to medical practitioners bulk billing children and concession cardholders, and for services provided in areas classified as rural and remote, some outer metropolitan areas, and Tasmania. In addition, the reforms increased MBS fees, as well as increasing the Medicare subsidy for GP visits to 100% of the MBS fee.

The Pharmaceutical Benefits Scheme, PBS, provides subsidised access to listed medicines. In 2003-04 the total cost of the scheme was $5,607.5 million and it provided 165.4 million prescriptions. In 2003 the prescription copayment was $23.10 for general patients and $3.70 for concessional patients. Once annual OOP expenditure reached specified thresholds ($708.40 for general patients and $192.40 for cardholders) the OOP payment per prescription fell to zero for concessional patients and to the concessional rate for general patients. In 2003-04, 83% of all prescriptions and 72% of overall costs of the PBS were concessional.

Dental services in Australia are almost entirely privately provided under fee-for-service private practice arrangements. State and Territory governments operate some public dental services with an emphasis on emergency care for low income groups. The Commonwealth initiated a public dental health program for prevention and treatment for the same target group in 1994 but it was discontinued in 1996.

The extent to which consumers face OOP costs for devices, prosthesis, aids and appliances (appliances from here on) depends on a range of factors. Consumers face zero OOP for appliances received as part of a public inpatient episode. For private inpatient episodes, consumers face zero OOP cost if the device is listed on the Australian Government's no-gap list. In June 2007, consumers made OOP payments for approximately 10% of 9,000 devices. For appliances provided outside of the hospital setting, consumers face the majority of costs. In 2002-03, consumers paid 78% of the $2.3 billion spent on appliances in the out-of-hospital setting through OOP payments. Private health insurers contributed approximately 10% for consumers with ancillary insurance. The Australian Government's hearing services program accounts for the majority of public expenditure on appliances.

Health insurance can be purchased to cover out-of-pocket costs associated with private inpatient treatment in either private or public hospitals and to cover other procedures and items such as prostheses and devices provided to private in-patients, and ancillary services which include dental care, allied health services and complementary care. Depending on agreements between insurers, private hospitals and medical specialists, private inpatients may face zero (no-gap) or specified (known-gap) OOP payments.

Concession cardholders are entitled to a range of additional subsidies and reduced prices for health care services and products, depending on the type of card they have. Table 1 lists the available health concession cards, their eligibility rules as well as the cardholders' entitlements. Eligibility for a pensioner, health care and seniors' health care card is primarily linked to whether an individual or household is a recipient of qualifying government benefits such as the age or disability allowance or are in receipt of specified allowance and have sufficiently low income to qualify for the full rate of Family Tax Benefit Part A. Veterans of Australia's defence forces who have qualifying service may be eligible to one of the three types of DVA cards.

Every concession card entitles the card holder to the concessional rate for listed prescription medicines. The Safety Net card provides further subsidies for families who accrue high OOP expenses from prescription medicines through the. Some cardholders are also entitled to free hearing services and aids. DVA cardholders may be entitled to a wider range of subsidies. DVA 'Gold' cardholders do not face any OOP costs for their health care services as long as the provider agrees to charge patients in line with DVA arrangements. In general, these arrangements are more generous than similar government subsidies aimed at the general population. 'White' cardholders have similar entitlements but only if the service or product is in connection with a specified war-related condition.

3. Model and empirical strategy

The focus of this paper is the form of the relationship linking health OOP expenditure shares and total expenditure, that is, Engel curve estimation. Engel curves can be estimated parametrically, however even flexible parametric specifications, such as Piglog, can fail to capture relationships inherent in the data. The relationship between expenditure share and log of expenditure may be quite non-linear if households' responses to increases in total expenditure change across the distribution. For example, households at the lower end of the distribution may derive a larger health gain from a given health expenditure compared with those higher in the distribution. To better understand the relationship between health care demand and total expenditure, it is important to use an estimation technique that allows the full range of responses. Nonparametric estimation methods, such as the lowess (locally weighted scatterplot smoothing) estimator of Cleveland (1979), makes no assumptions about functional form and so achieves this goal (see Delgado and Robinson, 1992). However nonparametric regressions are generally limited to the analysis of bivariate relationships. If relevant covariates are omitted, nonparametric estimates may be biased. For example, if age positively affects demand for health care and negatively affects total expenditures, excluding age would cause an upward bias in the estimated coefficient on expenditures at low expenditures and a downward bias at high expenditures. When there are many potential regressors, fully nonparametric analysis becomes impractical and it is common to estimate a semi-parametric model which combines parametric and nonparametric components.

We estimate a partial linear model using the semi-parametric approach of Yatchew (1997). The dependent variable is the jth out-of-pocket health expenditure share for household i, w_{ij}. The conditional mean expenditure share is a linear regression function of a number of controls, z_i and a non-linear function of the log of equivalised total household expenditure, $g_j(\ln(x_i))$. The forms of the function $g_j(.)$ are unspecified:

$$E\left[w_{ij} \middle| z_i, x_i\right] = z_i\beta_{ij} + g_j(\ln x_i) + \varepsilon \quad (1)$$

For each health expenditure share, the data is ordered by equivalised household expenditure and differencing is used to remove the non-parametric effects of total expenditure. The parameters, β, of the linear component of the model are estimated on the differenced data. The parameters are then applied to the non-differenced data and subtracted from the expenditure share. The form of the function between the adjusted share and the log of equivalised total household expenditure is estimated non-parametrically.

$$w_{ij} - z_i\hat{\beta}_{ij} = z_i\left(\beta_{ij} - \hat{\beta}_{ij}\right) + g_j(\ln x_i) + \varepsilon_{ij} \cong g_j(\ln x_i) + \varepsilon_{ij} \quad (2)$$

The approximation in equation (2) holds because $\hat{\beta}$ converges sufficiently quickly to β.

The Yatchew partially linear model is a development of the procedure of Robinson (1988). The Yatchew approach eliminates the necessity for non-parametric estimation of the relationship between each of the control variables in the parametric component of the model and total expenditure. Partially linear models

have been adopted in many applied settings. Yatchew (1997) includes an application investigating the relationship between electricity distribution costs and scale of operation. Recent applications of partially linear techniques include new business startups (Mesnard and Ravallion, 2006), temperature trends (Gao and Hawthorne, 2006), systemic inflammatory response syndrome (Liang 2006), the personal computer market (Stengos and Zacharias, 2006) and credit foreclosures (Pence, 2006).

Engel curve applications more closely related to this paper include Bhalotra and Attfield (1998) and Blundell, Duncan and Pendakur (1998). Bhalotra and Attfield use Robinson's model to estimate semi-parametric Engel curves for rural Pakistan using a large household survey and estimate the effects of household size and composition on consumption patterns. The household composition variables are then used to infer patterns of intra-household allocation between children and adults. Blundell et al (1998) undertake semi-parametic estimation of Engel curve relationships using data from the British Family Expenditure Survey. Yatchew, Sun and Deri (2003) estimate semi-parametric equivalence scales and test for base-independence using South African data.

4. Data

The Household Expenditure Survey 2003–04 was conducted on a sample of dwellings throughout Australia from July 2003 to June 2004. The 6,957 households in the survey were selected from those not recently included in an ABS household survey and excluded non–private dwellings (such as hospitals, institutions, nursing homes, hotels and hostels) and dwellings in collection districts defined as very remote or indigenous communities. Information was collected from all persons aged 15 years and over in the selected household. Personal interviews were conducted and survey participants were also required to record in a diary all their expenditures over a two week period.

Total household expenditure, equivalised using the OECD equivalence scale, provides our welfare ordering. We exclude expenditures on income tax and mortgage repayments which are often negative and delete observations with negative expenditures on transport and on recreation. This leaves a sample of 6,693 households, of which 2,876 (43%) had access to one or more health concession cards in the household.

Figure 3 presents kernel densities of the distribution of log equivalised household expenditure by card status for the sample. Not surprisingly, given the eligibility rules, the density function for cardholders lies to the left of that for non-cardholders although there is considerable overlap. Table 2 presents mean equivalised total expenditure and mean health expenditures by quintile of equivalised total expenditure for the whole sample. The top panel includes all observations and the bottom two panels split the sample by card status. In the lowest quintile there are only 240 non-cardholder households (18% of the quintile population) and this proportion is reversed in the top quintile. Total health expenditure is lower for cardholders in the bottom two quintiles and higher in the top three, with cardholder expenditure in the top quintile almost double that of households without concession cards. This difference is driven by a small number of cardholder observations with large OOPs for hospital episodes and appliances.

Table 3 presents health expenditure shares by quintile for the three groups. These are the dependent variables, w_{ij} , of our partial linear model. While the unconditional total health expenditure share is about 3% across all quintiles, there is a slight fall for households without cards and a rise for those with cards across the distribution. The quintile average shares are also generally higher for cardholders. The pattern differs across categories of expenditure. GP average shares fall across the distribution, with cardholders' shares being slightly lower in all quintiles. In contrast, specialist shares rise for most of the distribution irrespective of card status. Prescription OOP shares fall across the distribution and they are generally higher for those with concession cards, despite the concessional co-payment rate and the PBS safety net. The shares for dental OOPs are substantially higher for those without concession cards.

Many of these differences are likely to be driven by health status, with cardholders being older and in poorer health. Doctor fees may also vary by location. Bulk billing rates tend to be higher in cities than regional areas, particularly for GP visits. In the parametric part of the partial linear model we control for age and location. Table 4 presents means of the control variables for the whole sample and by card status. The age distribution is very different by card status; cardholders are about 15 years older on average in every quintile. There appears to be little difference between the two groups by location, either by state of residence or region.

The proportion of zero expenditures in the data varies by expenditure category and card status. Of households with a health concession card, 11% have zero total health expenditures over the two-week diary period, compared with 7% for households with no card. Higher proportions of zero GP expenditures for cardholders could arise from either lower use or a higher rate of bulk billing. The proportions of zero expenditure on specialist visits and over-the-counter medicines are very similar for the two groups. This contrasts with dental expenditures. Cardholders have a lower rate of zero prescription expenditures reflecting higher average age and probably a higher incidence of chronic conditions. Only about 3.5% of households have non-zero hospital expenditures. Because public treatment in a public hospital is free, non-zero hospital expenditures indicate admission as a private patient. The rates do not differ by card status which is an unexpected result, given the relative incomes and insurance coverage by card status, and despite only DVA cards providing government assistance for private hospital treatment.

5. Results

In the semi-parametric specification we include controls for ten year age bands (age 40-49 omitted), state of residence (NSW omitted) and a capital city dummy. Age is clearly related to health need and we include states to control for varying supply conditions and price regimes. In the 2003-04 HES data items relating to health were not collected.

The data is ordered by equivalised household expenditure and the parameters, β , of the linear component of the model are estimated on the differenced data for each health expenditure share for the whole sample and separately by card status. (All regression results for these models are available on request from the authors.) The parameters estimated on the differenced data are applied to the non-differenced data and the predicted linear component of the model is subtracted from the expenditure share. The form of the

function between the adjusted share and the log of equivalised total household expenditure is estimated using lowess.

Figure 4 presents the estimated semi-parametric relationships between each health expenditure share and log of equivalised total expenditure. Figure 5 presents corresponding results split by card status. Both control for age and region. For some health expenditures, the highly non-linear relationships shown in Figure 4 arise from combining the two distinct subsamples distinguished by card status. This is particularly so for the shares of total health expenditure and allied health. However, for dental expenditures both subsamples exhibit quite complex non-linear relationships. Given the Engel curve specification, a positive slope of the lowess curve indicates an expenditure elasticity exceeding one and a negative slope an elasticity of less than one.

At the same level of equivalised total expenditure, cardholders generally have higher total health expenditure shares than non-cardholders across the middle of the distribution. While the difference in the unadjusted level of expenditure is about $4 per week, the corresponding difference in shares adjusted for age and location is closer to $2 per week.

The pattern of expenditure shares varies with subcategories of expenditure. Hospital expenditure shares are extremely small for both groups reflecting the low frequency of hospital admissions in the very short diary period and the high level of public subsidy for public hospital treatment. Cardholder hospital expenditure shares are higher across the whole distribution and tend to rise with expenditure. For the bulk of the distribution the two relationships show a closely aligned overall rising pattern.

For medical practitioners, concession cards might generally be assumed to give protection through moral suasion on providers to reduce the size of co-payments or to bulk bill. The results in Figure 5 suggest that this is effective for GP consultations but not for specialists. Bulk billing rates are much higher for GP visits than for specialists. The level of OOP payment for a GP consultation is unlikely to exceed $30 however there is greater potential variation in fees for specialist consultations and a single non bulk billed visit can involve an OOP payment of hundreds of dollars. While cardholders have higher expenditure shares for specialist services, their use of unsubsidised allied health professionals is low relative to other households.

An unexpected result revealed in Figure 5 is the higher expenditure shares for prescription drugs at the lower end of the distribution. Neither the PBS concession rate nor the Safety Net appears to provide protection against high OOPs for prescriptions for poorer cardholders. For non prescription medicines shares across the middle of the distribution are relatively flat for both subsamples.

There is a very different pattern between dental and optical services which are both largely non-subsidised. Dental services are found to be a luxury for cardholders. For households without cards, the dental share is U-shaped across most of the distribution while for those with cards it is very low for the poorest households and then has a rising pattern. Optical shares for non-cardholders are generally constant across the distribution but rise for cardholders and for most of the distribution the share is higher.

In general prices are likely to be the same for dental and optical services irrespective of card status. Use of dental services is relatively low for cardholders for most of the distribution. Cardholders appear to forego non-subsidised dental services compared with non-subsidised optical services. This is unlikely to result from reimbursement of OOPs via ancillary insurance since non-cardholders are 70% more likely to be insured.

6. Conclusions

Over 21% of health expenditure was funded by OOP payments in 2003-04. On average this represents just over 3% of total household expenditure, 3.4% for households with concession cards and 2.9% for those without. Across the middle three quintiles of the distribution and controlling for age and location, cardholders have higher total health expenditure shares despite higher levels of subsidy. The major drivers of this difference are not categories of expenditure where cards offer little or no protection: dental, non-prescription medicines and allied health. They are specialist consultations, appliances and, most surprisingly, prescriptions, where concession cards guarantee a subsidy. This suggests that the considerably lower prescription co-payment for cardholders is more than offset by higher rates of utilisation. It is also unlikely that the lower dental share by cardholders is due to significantly better dental health. More likely is that lower dental utilisation is driven by price. The Commonwealth dental program, which was targeted on concession card and pension status, was removed in 1996. Since then dental expenditures are paid wholly out-of-pocket for those without private insurance and remaining state dental programs provide very limited assistance. Both GPs and specialists have the choice to bulk bill concession cardholders and the results in this paper indicate that GPs take up the option more than specialists and that this concentrates gains in the lower end of the distribution. Perhaps a greater policy focus should be placed on specialist bulk billing rates than those of GP which have been a major focus in recent years.

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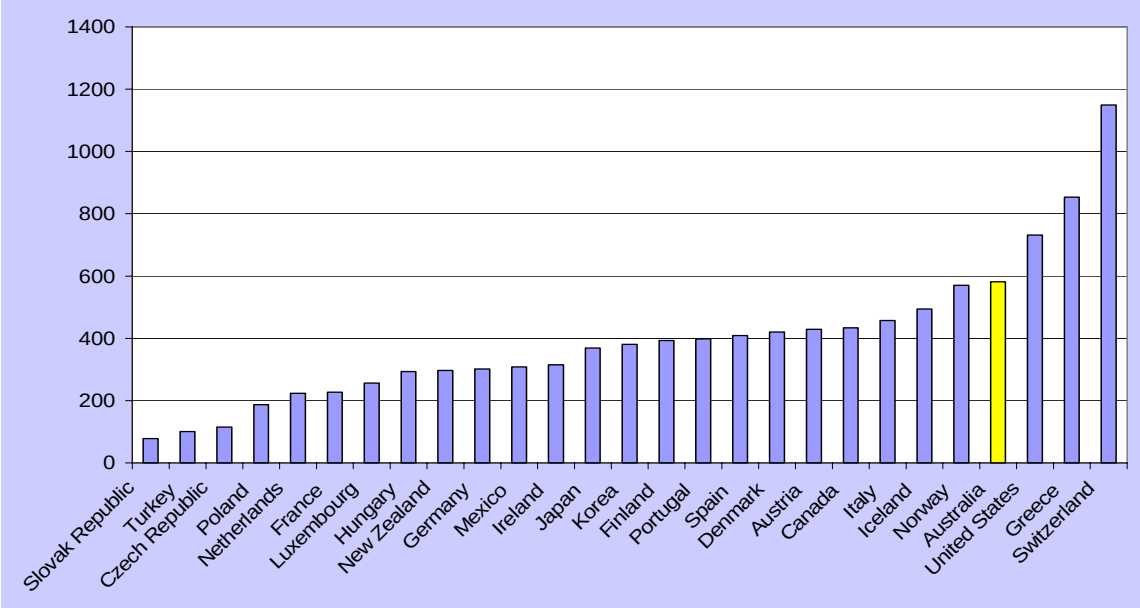
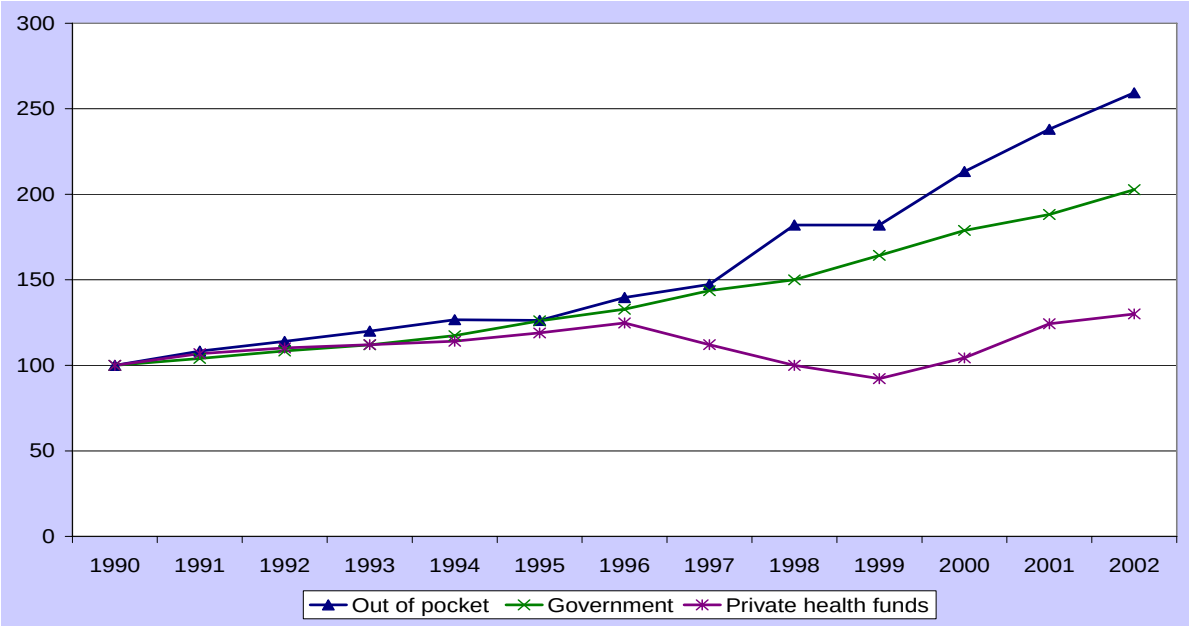
Figure 1: International comparisons of per capita out-of-pocket health care costs, 2002 $USPPP



Source: OECD Health Data 2006

Figure 2: Growth in per capita health care financing by source, Australia, 1990 - 2002



Source: OECD Health Data 2006

Table 1: Health care card eligibility and entitlements

Type	Eligibility	Entitlements
Pensioner Concession Card (Household)	▪ Age or Disability Support Pension, Parenting or Carer Payment ▪ Mature Age Allowance ▪ Age>60 years plus Newstart, Widow, Sickness, Parenting or Partner Allow	▪ PBS concessional rate ▪ Medicare Safety Net lower threshold ▪ Hearing services and aids
Health Care Card (Household)	▪ A qualifying social security benefit or supplementary payment ▪ Maximum rate of Family Tax Benefit Part A and a Carer (child) or a Mobility Allowance.	▪ PBS concessional rate ▪ Medicare Safety Net lower threshold ▪ Hearing services and aids (if in receipt of Sickness Allowance)
Commonwealth Seniors Health Card (Individual)	▪ No income support payment, service pension or supplement and age-pension age and taxable income less than $50,000 (single) or $80,000 (couple)	▪ PBS concessional rate ▪ Medicare Safety Net lower threshold
HIC Safety Net Concession Card (Household)	▪ Concession card holder and PBS-related OOP costs greater than $253.80	▪ Free PBS prescriptions
HIC Safety Net Card (Household)	▪ PBS-related OOP costs greater than $960.10	▪ PBS concessional rate
DVA Gold Card all health conditions (Individual)	▪ Veterans : ex-prisoners of war, receive disability pension, age or invalidity pension and satisfy income and asset test and have qualifying service	▪ PBS concessional rate ▪ Medicare Safety Net lower threshold ▪ Hearing services and aids ▪ All health care services if provider agrees to treat under DVA arrangements
DVA White Card limited health conditions (Individual)	▪ Veterans: with an accepted war or service caused injury or disease, malignant cancer, TB, post-traumatic stress, anxiety or depression	▪ PBS concessional rate ▪ Medicare Safety Net lower threshold ▪ Hearing services and aids (if in receipt of Sickness Allowance) ▪ All health care services relating to limited conditions if provider agrees to treat under DVA arrangements
DVA Orange Card (Individual)	▪ Veterans: qualifying service from WW1 or II, age greater than 70 and resident in Australia more than 10 years.	▪ PBS concessional rate

Figure 3: Distribution of total expenditure by card status, Australia 2003 - 4

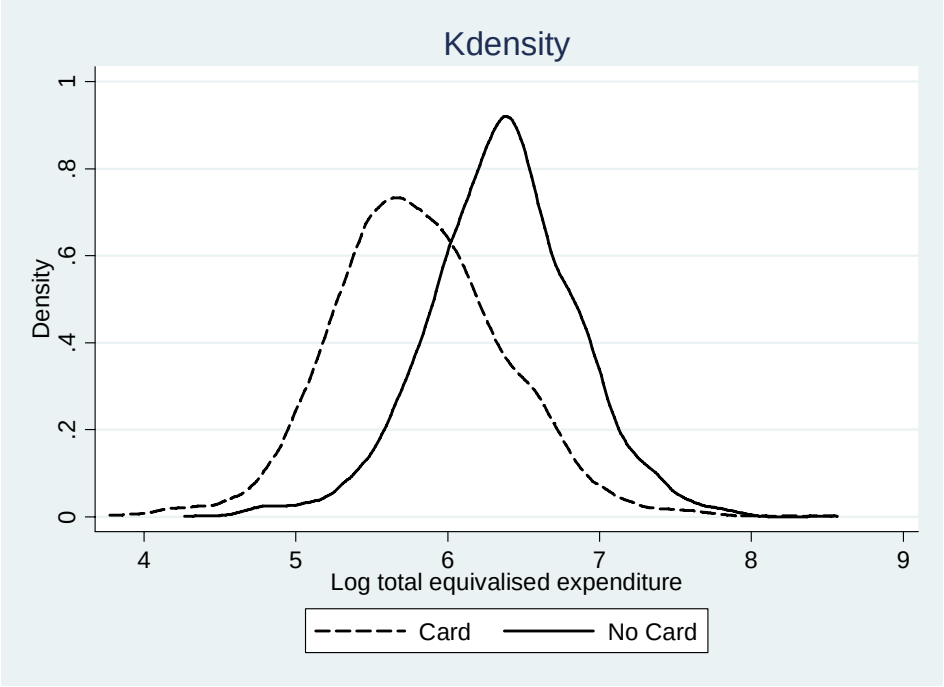


Table 2: Health expenditures by quintile of equivalised total expenditure and card status ($/week)

	Q1	Q2	Q3	Q4	Q5
All					
Observations	1339	1339	1338	1339	1338
Equivalised total expenditure	203	337	469	631	1,057
Quintile upper bound	275	401	543	740	5,323
Total	9.55	17.00	26.05	33.00	52.98
GP	0.65	1.23	1.75	2.13	2.36
Specialist	0.97	2.49	4.10	5.16	7.55
Prescriptions	2.23	2.89	3.94	4.89	5.27
Non-prescription medicines	2.69	4.92	5.84	7.43	8.31
Dental	1.58	2.70	5.00	7.00	11.83
Optical	0.43	0.92	1.34	1.32	2.20
Allied health	0.41	0.86	1.48	2.24	2.97
Appliances	0.14	0.22	0.73	0.92	4.53
Hospital	0.26	0.46	1.26	1.17	7.35
No Card					
Observations	240	570	860	1046	1101
Total	11.11	17.80	24.58	31.60	46.59
GP	0.97	1.72	1.90	2.25	2.55
Specialist	0.95	2.53	3.44	5.25	7.73
Prescriptions	1.73	2.91	4.08	4.42	5.25
Non-prescription medicines	2.48	4.35	5.46	7.05	8.11
Dental	3.00	3.89	4.81	6.72	12.20
Optical	0.50	0.67	1.25	1.12	2.25
Allied health	1.06	1.00	1.46	2.33	3.11
Appliances	0.17	0.09	0.86	0.69	1.11
Hospital	0.24	0.37	0.88	1.01	3.65
Card					
Observations	1099	769	478	293	237
Total	9.21	16.41	28.70	38.00	82.68
GP	0.57	0.88	1.48	1.69	1.49
Specialist	0.98	2.46	5.29	4.83	6.73
Prescriptions	2.34	2.88	3.71	6.56	5.35
Non-prescription medicines	2.74	5.35	6.54	8.77	9.22
Dental	1.27	1.82	5.33	8.01	10.11
Optical	0.42	1.11	1.49	2.03	1.98
Allied health	0.26	0.75	1.52	1.92	2.30
Appliances	0.13	0.31	0.49	1.73	20.46
Hospital	0.27	0.52	1.95	1.75	24.54

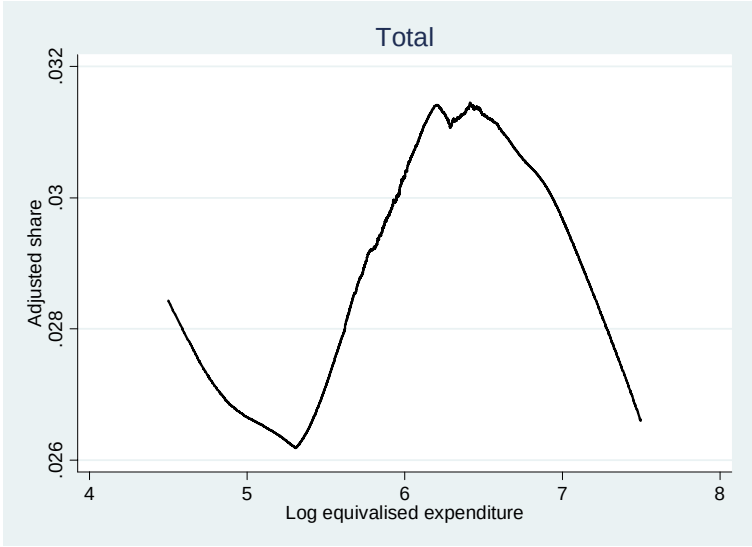
Table 3: Health expenditure shares (%) by quintile of equivalised total expenditure and card status

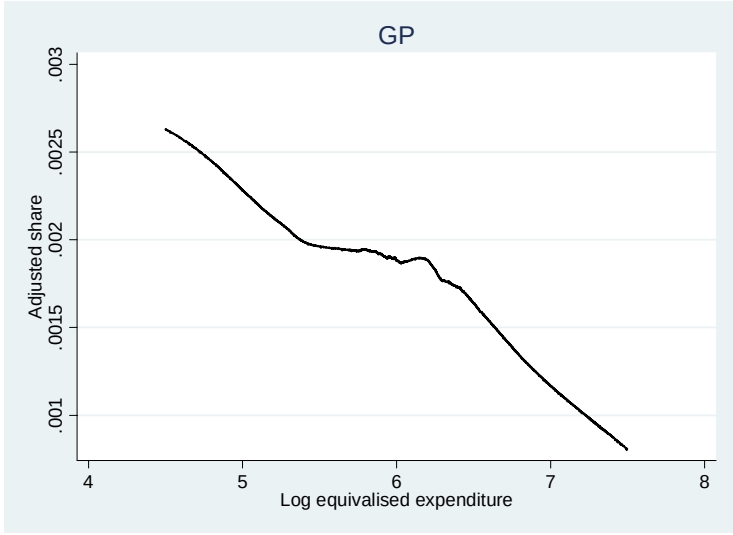
	Q1	Q2	Q3	Q4	Q5
All					
Total	3.33	3.07	3.33	3.05	2.95
GP	0.24	0.21	0.22	0.19	0.14
Specialist	0.34	0.45	0.52	0.46	0.46
Prescriptions	0.84	0.54	0.51	0.48	0.33
Non-prescription medicines	0.92	0.93	0.74	0.68	0.51
Dental	0.49	0.45	0.64	0.62	0.69
Optical	0.13	0.16	0.15	0.13	0.13
Allied health	0.14	0.14	0.20	0.21	0.18
Appliances	0.04	0.05	0.08	0.10	0.15
Hospital	0.10	0.08	0.20	0.10	0.31
No Card					
Total	3.50	2.86	3.03	2.86	2.82
GP	0.31	0.28	0.23	0.20	0.15
Specialist	0.30	0.36	0.40	0.46	0.47
Prescriptions	0.63	0.50	0.53	0.44	0.32
Non-prescription medicines	0.72	0.73	0.67	0.63	0.50
Dental	0.89	0.59	0.60	0.58	0.71
Optical	0.19	0.11	0.14	0.11	0.14
Allied health	0.34	0.16	0.19	0.22	0.18
Appliances	0.04	0.01	0.10	0.07	0.07
Hospital	0.08	0.06	0.12	0.09	0.23
Card					
Total	3.29	3.23	3.86	3.73	3.55
GP	0.23	0.16	0.20	0.15	0.10
Specialist	0.35	0.51	0.73	0.47	0.43
Prescriptions	0.88	0.57	0.49	0.64	0.35
Non-prescription medicines	0.97	1.07	0.86	0.86	0.56
Dental	0.41	0.34	0.72	0.79	0.62
Optical	0.12	0.21	0.17	0.19	0.12
Allied health	0.10	0.13	0.21	0.19	0.14
Appliances	0.04	0.07	0.05	0.19	0.50
Hospital	0.10	0.10	0.33	0.15	0.71

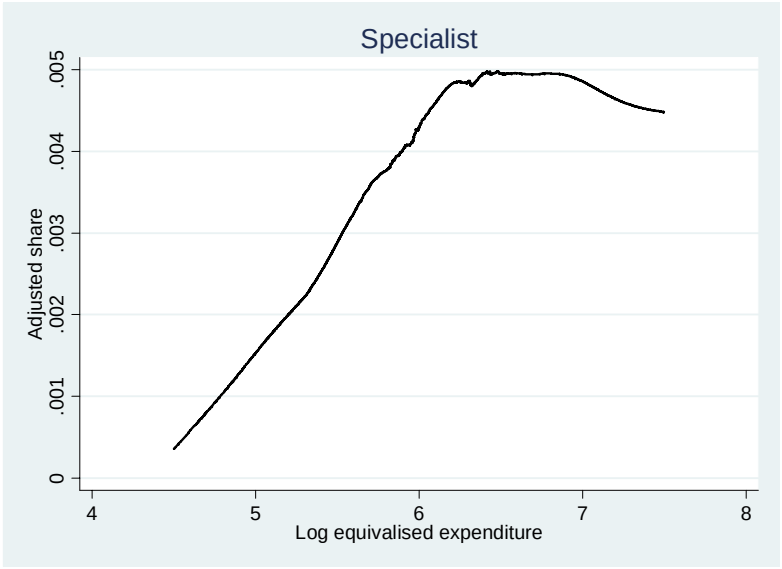
Table 4: Means of control variables by quintile of equivalised total expenditure and card status

	All					No Card					Card				
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
age lt 30	0.07	0.10	0.10	0.12	0.12	0.08	0.10	0.12	0.14	0.14	0.07	0.10	0.08	0.06	0.06
age 30 to 39	0.13	0.20	0.23	0.25	0.23	0.22	0.26	0.28	0.28	0.26	0.11	0.15	0.15	0.13	0.08
age 40 to 49	0.14	0.22	0.26	0.25	0.26	0.25	0.32	0.31	0.28	0.28	0.11	0.15	0.19	0.15	0.16
age 50 to 59	0.16	0.16	0.19	0.23	0.23	0.25	0.21	0.21	0.24	0.23	0.14	0.12	0.15	0.20	0.22
age 60 to 69	0.17	0.15	0.12	0.09	0.11	0.10	0.09	0.07	0.05	0.07	0.19	0.20	0.22	0.25	0.29
age 70 to 79	0.22	0.12	0.07	0.05	0.03	0.05	0.01	0.02	0.01	0.01	0.25	0.20	0.18	0.18	0.12
age gt 79	0.11	0.04	0.02	0.01	0.01	0.04	0.00	0.00	0.00	0.00	0.13	0.07	0.04	0.03	0.05
nsw	0.23	0.24	0.24	0.26	0.28	0.25	0.23	0.24	0.26	0.29	0.23	0.25	0.24	0.27	0.28
vic	0.22	0.22	0.24	0.20	0.21	0.27	0.21	0.23	0.21	0.21	0.21	0.23	0.26	0.20	0.22
qld	0.13	0.14	0.13	0.12	0.11	0.11	0.15	0.13	0.13	0.11	0.14	0.13	0.14	0.09	0.12
sa	0.14	0.14	0.13	0.10	0.11	0.10	0.14	0.13	0.10	0.11	0.15	0.14	0.14	0.10	0.11
wa	0.11	0.10	0.10	0.11	0.10	0.13	0.12	0.11	0.10	0.09	0.11	0.10	0.08	0.16	0.12
tas	0.10	0.08	0.08	0.08	0.06	0.07	0.07	0.07	0.07	0.06	0.10	0.09	0.09	0.11	0.08
nt/act	0.06	0.07	0.08	0.11	0.13	0.08	0.09	0.09	0.13	0.15	0.06	0.06	0.05	0.07	0.08
capital city	0.56	0.61	0.64	0.64	0.65	0.58	0.61	0.65	0.64	0.65	0.56	0.60	0.61	0.64	0.62

Figure 4: Semi-parametric relationship between shares and equivalised total expenditure







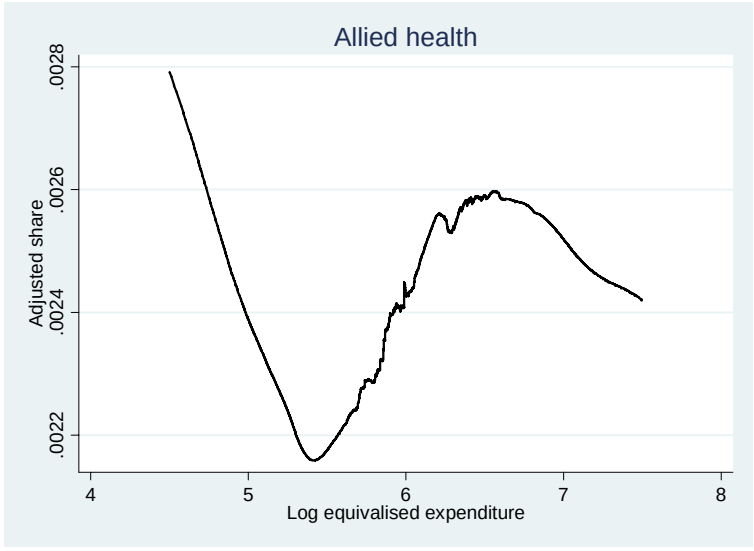
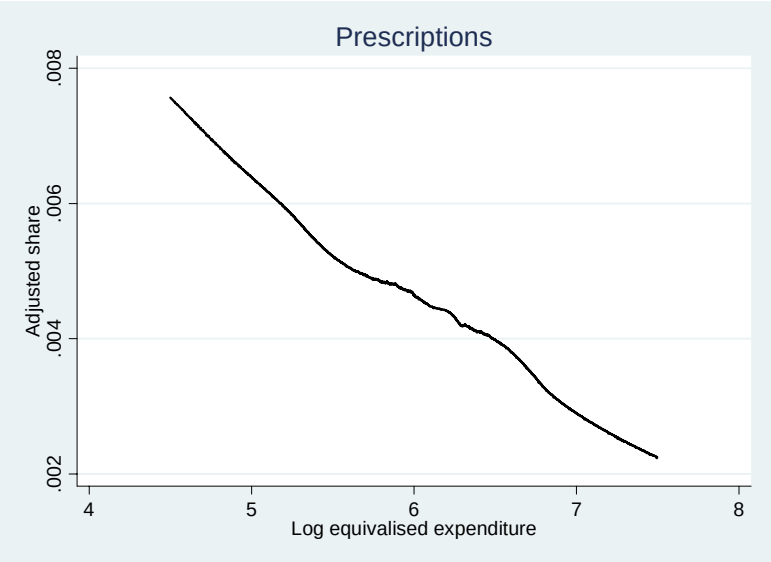
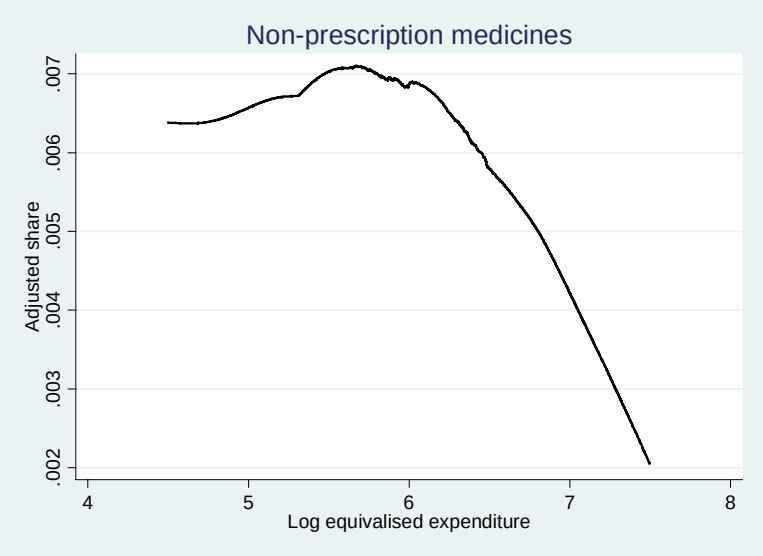
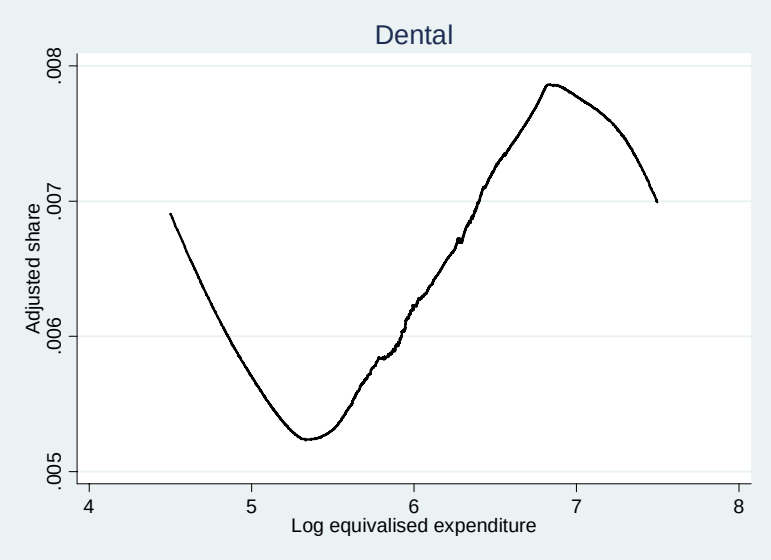


Figure 4 continued: Semi-parametric relationship between shares and equivalised total expenditure







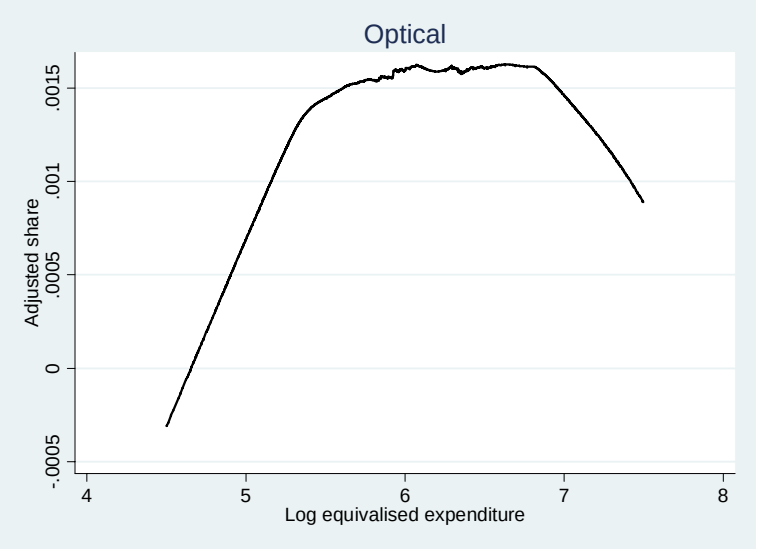
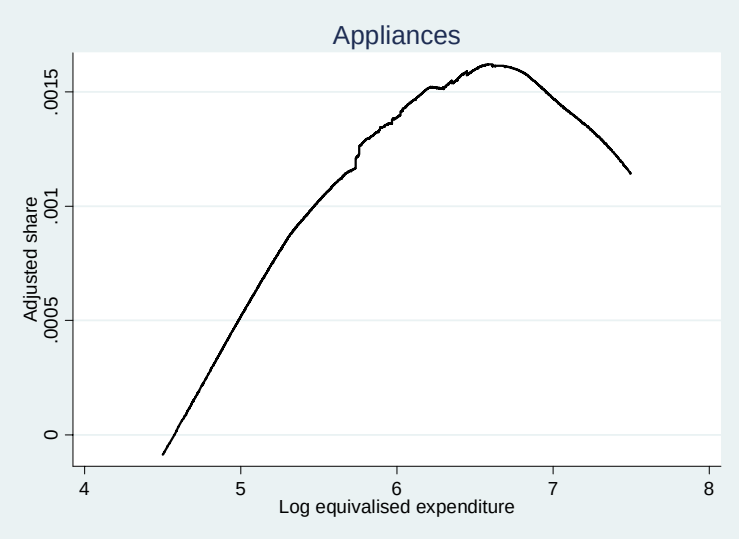


Figure 4 continued: Semi-parametric relationship between shares and equivalised total expenditure



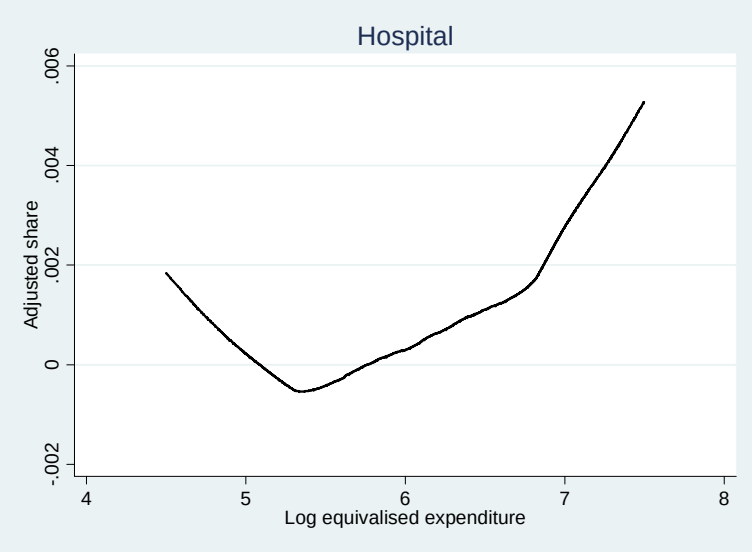


Figure 5: Semi-parametric relationship between shares and equivalised total expenditure by card status

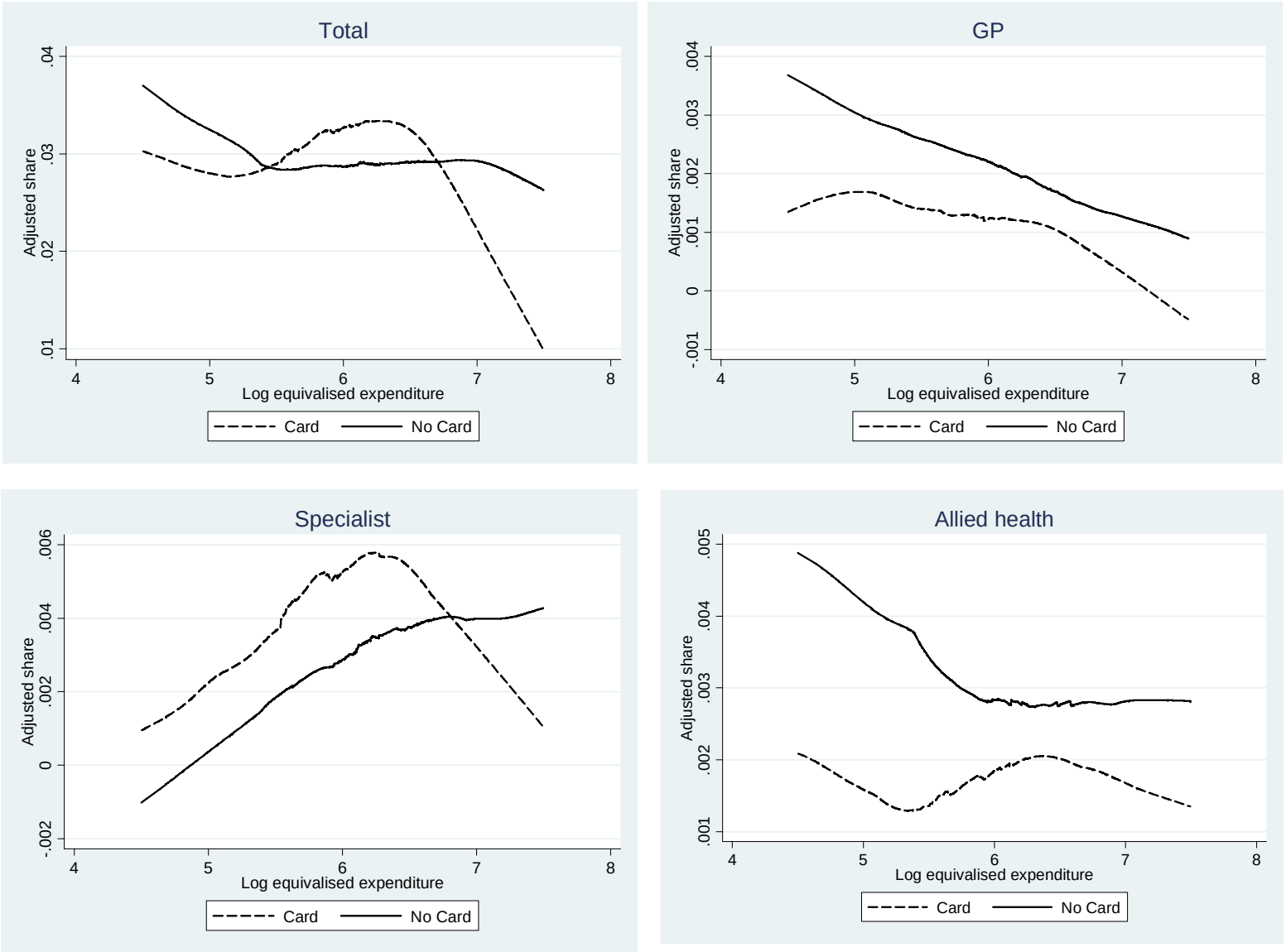
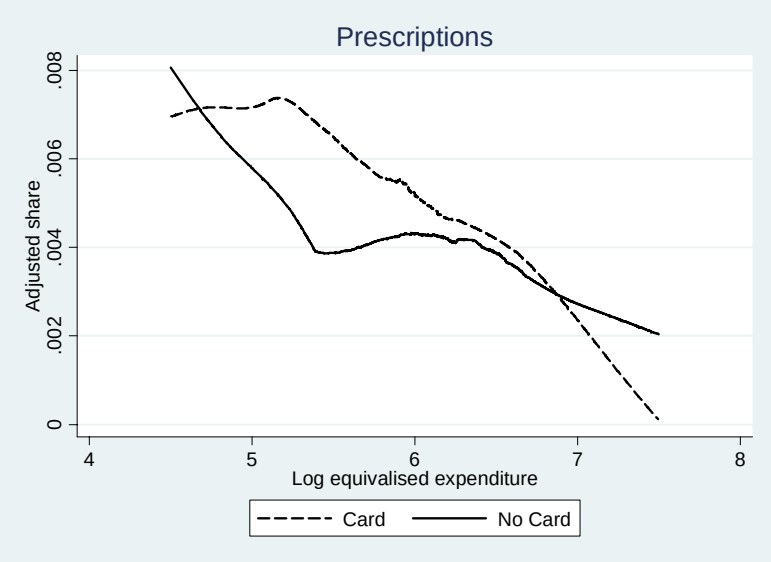
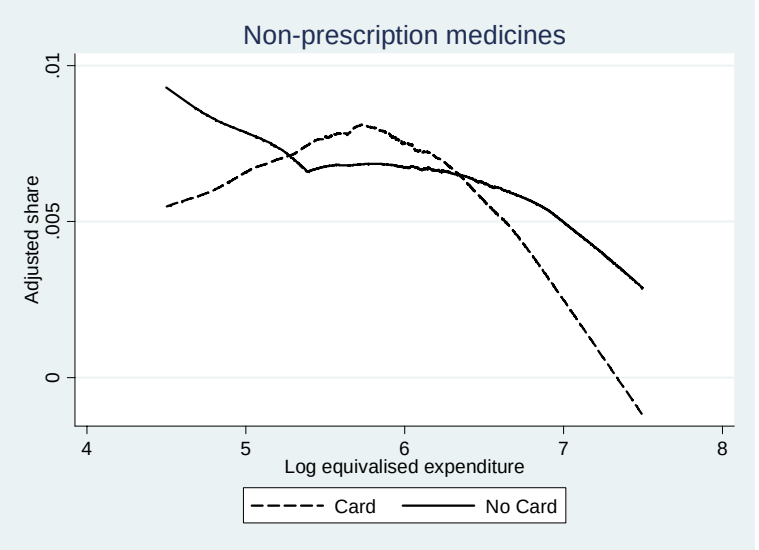
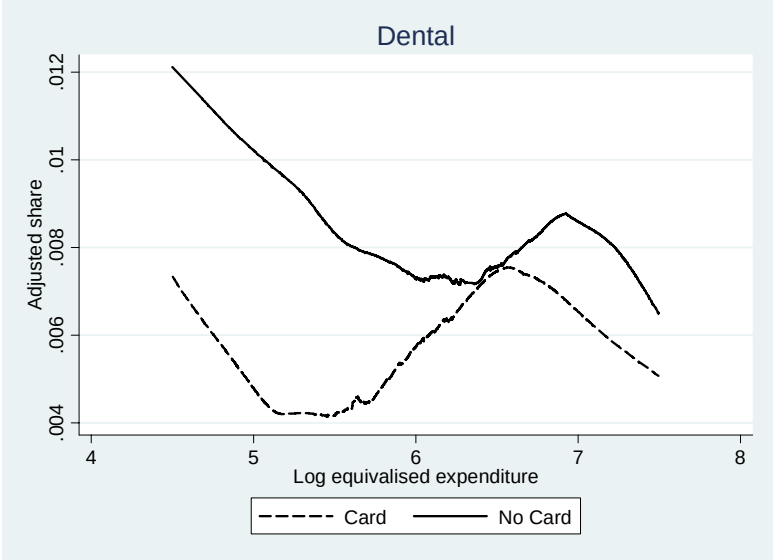


Figure 5 continued: Semi-parametric relationship between shares and equivalised total expenditure by card status







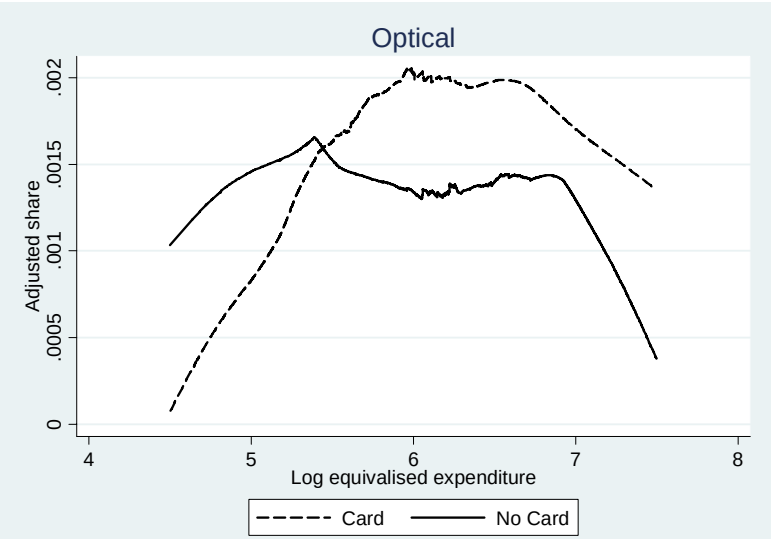
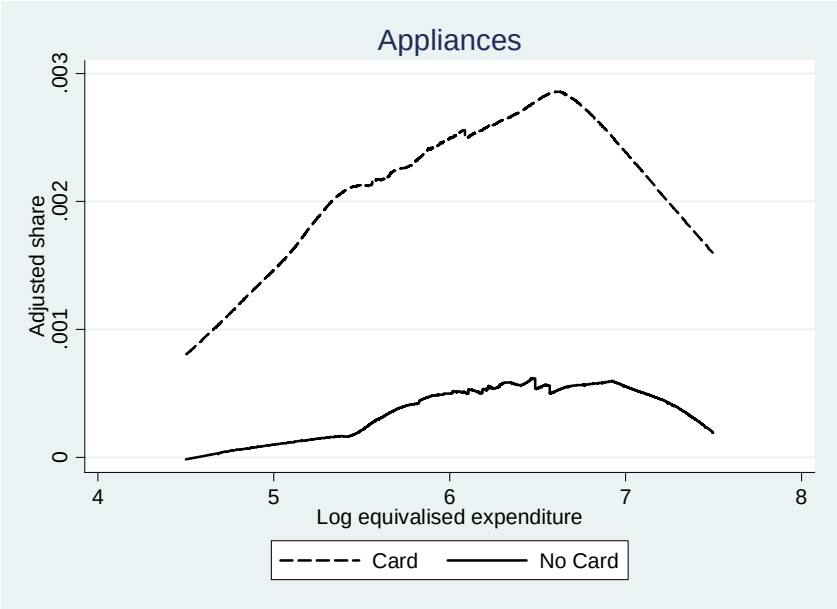
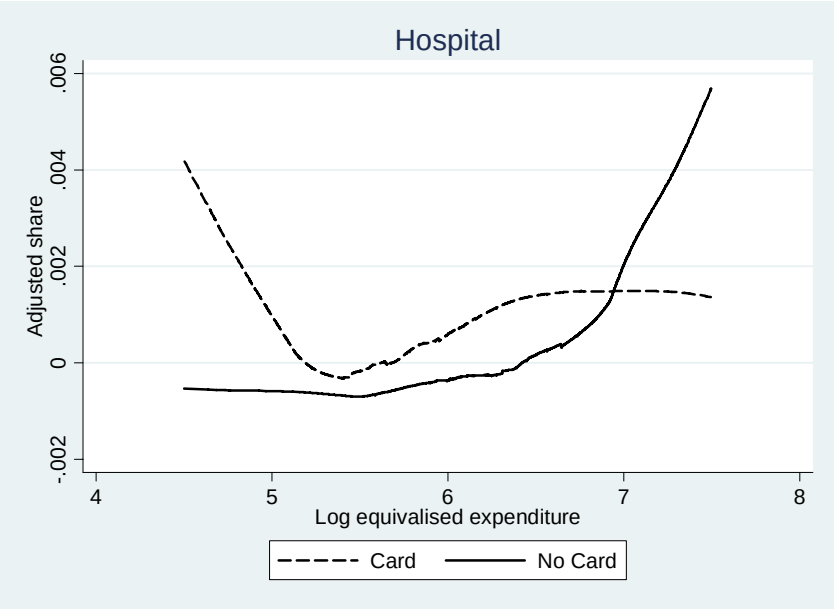



Figure 5 continued: Semi-parametric relationship between shares and equivalised total expenditure by card status