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The REFinE-PHC Report

Primary Health Care in Australia: towards a more sustainable and equitable health care system

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A C K N O W L E D G E M E N T S

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This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either FaHCSIA or the Melbourne Institute.

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Background

Numerous editions of the Australian Government's Intergenerational Report have consistently shown that health care is the fastest growing component of the Commonwealth Government's outlays. Over the next forty years, the federal government's expenditure on health is expected to almost double in terms of share of GDP. Not surprisingly, one of the central aims for policy advisers is to make the health care system more sustainable.

Policy advisers in Australia, and internationally, are placing greater importance on the role of primary care to deliver a more sustainable health care system. A well-functioning primary care system is widely regarded as an essential element of a high performing health care system [1]. The recently announced Medical Homes trial is a good example of the way the Australian government is seeking to reform primary care and place it at the centre of the health care system. In part, such reforms are driven by the promise of better management of chronic diseases at earlier stages of disease in order to prevent further declines in health status, unnecessary hospitalisations and escalating health care costs.

With sustainability at the forefront of the policy debate, there is an urgent need to develop a better understanding of the drivers of health expenditure growth, and in particular the relationship between the role and functioning of primary care and other health care sectors.

However, health care reforms aimed at making the system more financially sustainable do so at the cost of fairness. The proposed mandatory co-payments for general practice consultations announced in the 2014 Federal Budget are a good example of this. On the one hand, the government was making the argument that the proposal would make Medicare expenditure more sustainable, but opponents argued that this would reduce access to general practitioners, particularly among low income people and the elderly. The ensuing debate was hotly contested, ideologically driven and largely absent of hard evidence. Indeed, due to the controversial nature of the 2014 co-payments, the government eventually abandoned its planned reforms altogether. One of the essential problems for Government is that the role primary care can play in making the Australian health care system more efficient and equitable is often unclear.

This report highlights the key results of one of the major work themes undertaken as part of the Centre for Research Excellence on the Financing and Economics (REFinE) of Primary Health Care. It reports on a number of projects that have developed our understanding of the drivers of health care use and expenditure. There are two themes to this report that seek to deliver a better understanding of,

- Drivers of health care costs and use (Part A)
- Access and equity in Australia's health care system (Part B)

In developing this understanding, it examines the interrelationships between primary care and other sectors of the Australian health care system, including hospital care, specialist care and emergency department care. In particular, it will address the relationship between primary health care and the short and medium term use of other health care services, particularly the substitution between general practice and specialist care; and between general practice and emergency department and admitted hospital care. It will report on our investigations of the distribution of health expenditures and determine to what extent health expenditures are associated with patient demographics, socioeconomic and health status.

This report draws on a number of papers that have been developed as part of the work undertaken at the Centre for Research Excellence on the Financing and Economics of Primary Care (REFinE). Most of these papers have been published, others are in the final stages of development. Collectively, these provide a greater understanding of the cost trajectories of people with chronic diseases.

Part A: Drivers of health care use and cost

INTRODUCTION

Health care expenditure has increased at a faster rate than national income; this phenomenon has been observed over time and across countries [1]. The real growth in health care expenditure for Australia has averaged 5.1% pa over the decade to 2012-13 [2]. Financial sustainability can be considered from the perspective of the economy and whether future economic growth can continue to support a growing share.

The perspective of the economy as a whole is a more important question than the limited perspective of the Australian government taken in the successive Intergenerational Reports. Successful constraint of Federal government outlays may simply shift cost to other payers in the system; reducing the funding of public hospitals shifts the burden to States and Territories, while consumer co-payments shifts financing to patients.

Opportunities for improving the performance and efficiency of health services can meet any challenges of rising expenditures; and as the Productivity Commission pointed out is a superior way of meeting the challenges ahead [3]. Over recent years it has become increasingly clear that policy advisers are looking towards the primary health care system to achieve overall system improvements. To achieve this there is a need to better understand what drives the use and costs of health care and identify how primary care can drive improvements. This includes a better understanding of how the primary care sector could become more efficient in itself, as well as how it could influence the demand and costs of other parts of the health care system.

The papers summarised in this section of the report provide three different perspectives of cost and utilisation,

- A disease-based approach: Diabetes and diabetes-related complications health care use and costs [4]
- A geographic approach: explaining variations in primary care use in Australia [5]
- A social approach: examines the role of living alone on hospital use [6]

Collectively, the three papers seek to develop a better understanding of the drivers of health care use and costs.

STUDY A1: A DISEASE-BASED APPROACH TO UNDERSTANDING HEALTH CARE COSTS – THE CASE OF DIABETES

Introduction

Diabetes is a complex condition with a high and rising prevalence, and with serious potential complications. Diabetes is a leading cause of cardiovascular disease, blindness, foot amputations and kidney failure that can result in the need for a kidney transplant or dialysis [7]. However, there is strong evidence that due to its strong links with obesity, a substantial proportion of diabetic cases can be prevented; and with appropriate care and careful control of the disease, many of these complications can be avoided [8]. This requires well-designed diabetic care pathways that are aligned to the best available evidence and practice guidelines, and involve multiple providers over long periods of time. The focus is on providing high quality primary care services to manage diabetes effectively and efficiently.

This paper examines the consumption of health services and costs associated with the management and treatment of diabetes and a number of diabetes-related complications.

The figures derived in this analysis provide a measure of the potential savings that could be made through more effective prevention and management of diabetes.

Methods

The study used data from the Sax Institute's 45 and Up Study. This survey covers more than 267,000 non-institutionalised people aged 45 and over in the state of New South Wales (NSW) [9]. The sample in terms of most demographic and socioeconomic characteristics, such as age, gender, marital status, and employment, is nationally representative [10]. The 45 and Up Study is linked to several health administrative datasets by the Sax Institute, including Medicare claims data[1] and the Pharmaceutical Benefits Schedule (PBS), as well as the NSW Admitted Patient Data Collection (APDC), and Emergency Department (ED) Data Collection (EDDC), between 2006 and 2011. Collectively, these administrative datasets provide the most comprehensive and accurate measure of health care costs in Australia.

The information contained in the 45 and Up Study and the linked medical administrative data was used to identify the target groups in this project. The groups were,

- General population: all individuals in 2011 were selected from the 45 and Up study and the linked datasets
- Diabetic population: all patients who purchased at least three months of treatment of insulin or an oral antidiabetic in the year of study
- Diabetic patients who have undergone lower-extremity amputation. All patients whose records in the APDC dataset indicate that they have been admitted to hospital with the diagnosis stated in the selection rule or a diagnosis with diabetes.
- Diabetic patients with renal failure: all patients with end-stage renal failure complications among the population of those with diabetes during the study year.

Cost information was derived from (i) MBS doctor fees for medical services; (ii) the PBS gross price of prescriptions; (iii) national cost weights for public and private hospitals; and (iv) EDDC data to estimate the costs of ED visits.

Results

The entire 45 and Up sample consists of 259,369 residents of NSW. Using the criteria described above reveals that 6.6% (n=17,120) of people aged 45 years and over can be classified as diabetic patients. Table 1 summarises the composition of the diabetic population and subgroups.

Table 1: Diabetic population

	Age group (years)				
	45-54	**55-64**	**65-74**	**Over75**	**Total**
Total population	45,759	87,620	68,694	57,296	259,369
Total diabetic population	965	3,721	6,636	5,798	17,120
Total diabetic population by subgroup	528	2,621	5,745	5,216	14,110
Subgroup 1. Low extremity amputation	0	2	3	9	14
Subgroup 2. End-stage renal failure	25	70	102	163	360

[1] Participants' consent is sought for linking the administrative data to the survey data. The 45 and up study is bound by Commonwealth and State privacy legislation. Details of the governance and ethics can be found at https://www.saxinstitute.org.au/our-work/45-up-study/governance/.

It should be noted that there is a large overlap of patients in subgroups 1 and 2. The majority of patients who had experienced a lower extremity amputation also suffered from end-stage renal disease.

Table 2 presents the average annual health care cost per person in the 45 and Up study. It allocates costs on the basis of the source of funding (public or private); where privately funded health care can include costs paid for by patients directly as well as those paid by private health funds. The figures show that the cost of diabetes care is almost twice as high as those of the general population. The biggest cost items were those associated with hospital care, prescriptions and specialists.

Table 2: average health care cost per person by health sector and source of funding – general and diabetes population

	General Population		**Diabetes population**	
	Public	**Private**	**Public**	**Private**
	$	**$**	**$**	**$**
GP visits	407.00	42.35	712.40	31.60
Specialist visits	893.61	372.21	1,530.53	441.72
Diet counselling	1.45	0.16	4.88	0.45
Drugs	785.14	135.42	2,066.09	268.04
Pathology/imaging (blood, urine, ECG) *	183.83	20.78	307.66	26.40
Specific preventive care^	1.33	0.06	12.58	0.42
Hospital admission †	2,875.26	-	5,096.57	
Emergency Department visits ‡	129.84	-	243.52	
Total	5,278	571	9,974	769

** All the pathology service items are included in this category.*

^ All service items under the Diabetes Service Incentive Payment (SIP) programme are included in this category.

† The total cost of hospital admission is estimated by the costs/charges provided in the National Hospital Cost Data Collection (NHCDC) and the Hospital Casemix Protocol (HCP). The contribution from the benefits paid by the Australian Medicare Program is not available.

‡ The total cost of Emergency Department visits is estimated by the costs provided in New South Wales Costs of Care Standards. The contribution from the benefits paid by the Australian Medicare Program is not available.

Table 3 presents cost information for the two diabetes sub-groups identified in the study: those who have undergone a diabetes-related lower extremity amputation and those with end-stage renal failure. Health care costs for patients suffering from these two complications rise substantially, compared to either the general population or patients with diabetes. For patients with a lower extremity amputation, the annual cost is just under $100,000 and for those with end-stage renal failure, the cost is over $37,000 per year. The vast majority of these costs are paid for through public financing sources. More than 75% of costs are incurred at the hospital. This compares to around 50% for the general population and the diabetes population.

The high health care cost for the lower extremity amputation subgroup is partly explained by the high cost of the hospital admission relating to the amputation procedure. However, costs

remain high in subsequent years as well for this group. In the year following the procedure the average annual health care for this patient group is A$51,155.

Table 3: average health care cost per person by health sector and source of funding – diabetes complications

	Subgroup 1: Lower extremity amputation[10]		**Subgroup 2: End-stage renal failure**	
	Public	**Private**	**Public**	**Private**
	$	**$**	**$**	**$**
GP visits	1,140	2.40	942	53
Specialist visits	4,031	2,181	2,432	868
Diet counselling	3.60	-	4.00	1.00
Drugs	1,955	259	2,885	263
Pathology (blood, urine, ECG) *	1,085	299	579	112
Specific preventive care^	7.40		11	0.13
Hospital admission †	89,672		29,300	
Emergency Department visits ‡	1,871		1,213	
Total	99,767	2,742	37,366	1,297

** All the pathology service items are included in this category.*

^ All service items under the Diabetes Service Incentive Payment (SIP) programme are included in this category.

† The total cost of hospital admission is estimated by the costs/charges provided in the National Hospital Cost Data Collection (NHCDC) and the Hospital Casemix Protocol (HCP). The contribution from the benefits paid by the Australian Medicare Program is not available.

‡ The total cost of Emergency Department visits is estimated by the costs provided in New South Wales Costs of Care Standards. The contribution from the benefits paid by the Australian Medicare Program is not available.

Discussion

Diabetic patients are greater users of health care services than the general population. The cost of managing diabetes is nearly double the cost of the general population aged 45 and over. Costs escalate considerably when patients suffer from diabetes-related complications. For those with lower extremity amputation costs rise to around $100,000 in the year the amputation takes place but also remain high in subsequent years. For those who suffer from end-stage renal failure the costs rise to around $37,000 per year. This provides a justification from both a health and financial perspective to invest in programs and policies that can prevent or delay the onset of diabetes and its complications.

As complications arise, a greater proportion of the costs are incurred by public hospitals which, in turn, are the responsibility of state governments. The figures reveal one of the underlying challenges of Australia's system of health care funding. As patients become more complex and health status declines, greater responsibilities fall on public hospitals and state government budgets. However, these institutions have limited powers within the primary care sector to actively prevent patients from escalating down a path of worsening health outcomes and higher health care costs.

STUDY A2: WHAT EXPLAINS THE GEOGRAPHIC VARIATION IN THE USE OF GENERAL PRACTITIONERS IN AUSTRALIA?

Introduction

Across Medicare Local populations in Australia, the average number of GP consultations varies from 2.4 per capita to 7.4 [11]. Some variation can be accounted for by differences in health status and cultural or patient preferences. However, variation that is uncorrelated with population needs may signal inefficiency and inequality of a health care system. Specifically, it may suggest that people in low-use areas cannot access the GP care they need or unnecessary health care is being provided to people in high-use areas. Given the continuing increase in health care spending and an urgent need to reduce inefficient health care costs worldwide, identifying and understanding the sources of geographic variation can inform policy interventions that aim to improve efficiency and equity of health care delivery.

There are three aspects that underline the importance of the investigation of variation in GP use at an area level. First, it is the local areas that always take responsibility in formulating policies and strategies to improve coordination of care to ensure their patients receive the right care in the right place at the right time. Second, the supply conditions and accessibility of health care are usually measured at an area level rather than at an individual level. Additionally, the investigation of the substitutability and complementarity of different health care providers is more appropriate at area level.

Methods

Data were drawn from the Social Health Atlas (SHA) of Australia by SLA, which is released by the Public Health Information Development Unit (PHIDU).[2] In total, 1,094 SLAs are included in the SHA data and includes a range of population characteristics, including socioeconomic status, health status, risk factors, and use of health and welfare services in each SLA.

These data were used to investigate the factors that influence GP use. In general terms, the analysis investigates three different types of factors that can help explain regional variation: (i) population health care need, (ii) practice patterns of health care providers, and (iii) characteristics of the local health care system.

To analyse the factors that influence geographic variation in GP use and how their effects vary among different levels of GP usage, a Latent Class Model (LCM) is employed. The LCM can identify distinct groups of SLAs based on unobserved heterogeneity that is characterised by the population's latent health care need and unobserved features of the regional health care system; moreover, it can accommodate differential effects of observed factors at different levels of GP use.

Results

Table 4 reports the estimated parameters for the single- and two-class LCMs. Model performance measures indicate that LCM approach is justified. The proportion of SLAs belonging to Class 1, the low-GP-use class, is 0.671, indicating that the probability of a sample falling into this group is 67.1%.

[2] These data are part of the Public Health Information Development Unit's Social Health Atlas series.

Table 4: Estimation results for the single- and two-class latent class models

	Dependent variable: number of GP visits per capita by SLAs		
	Single-class model	**Two-class normal LCM**	
Variables	**(OLS)**	**Class 1: the low-GP-use group**	**Class 2: the high-GP-use group**
Age distribution (base is age 30-44)			
Age 0-9	0.069***	0.130***	-0.077
	(0.023)	(0.030)	(0.057)
Age 10-29	-0.018	-0.019	-0.019
	(0.015)	(0.017)	(0.047)
Age 45-64	0.001	0.013	0.003
	(0.013)	(0.017)	(0.035)
Age 65 and above	0.062***	0.027	0.066**
	(0.016)	(0.021)	(0.032)
Share of male	-0.027	-0.072**	0.005
	(0.029)	(0.036)	(0.055)
ASGC remoteness index (base is major city)			
Inner regional area	-0.999***	-1.462***	-0.117
	(0.100)	(0.165)	(0.244)
Remote and very remote areas	-1.269***	-1.711***	-0.381
	(0.125)	(0.217)	(0.321)
SEIFA-IRSD index (base is above 75th percentile - the most advantaged)			
25th percentile and below (the most disadvantaged)	1.401***	1.663***	1.302***
	(0.116)	(0.133)	(0.305)
25th-50th percentile	0.762***	1.012***	0.558***
	(0.105)	(0.125)	(0.203)
50th-75th percentile	0.492***	0.693***	0.352**
	(0.086)	(0.106)	(0.167)
Proportion of Aboriginal population	-0.036***	-0.074***	-0.010
	(0.012)	(0.012)	(0.012)
Number of EDs by SLAs (base is no EDs)			
1-2 EDs	0.107	0.183**	0.087
	(0.077)	(0.092)	(0.149)
3 or more EDs	0.130	0.156	0.283
	(0.117)	(0.140)	(0.266)
Constant	5.632***	7.276***	5.679
	(1.690)	(2.323)	(3.485)

*Note: Numbers in parentheses are White robust standard errors. * Significant level p<0.10, ** p<0.05, *** p<0.01.*

The results for the single-class model and the two-class LCM differ considerably. For the low-GP-use group, the proportion of males is found to have a statistically significant and negative association with GP usage; whereas it plays no role among the high-GP-use group. In addition, the results reveal that the higher the proportion of the Aboriginal

population, the less the GP usage, particularly for the low-GP-use class. The effect of geographic remoteness also varies between the two latent classes. Among the low-GP-use class, areas located outside major cities have lower GP use than those in major cities. The gap in GP usage widens with increasing remoteness. However, for the high-GP-use class, remoteness has a negative but statistically insignificant impact.

More disadvantaged areas have more GP visits than the less disadvantaged areas for both classes, but this effect seems to be larger for the low-GP-use class. There is no evidence that the number of EDs and intensity of GP consultations are substitutes for each other.

Discussion

The study suggests that the effects of regional and population characteristics on regional GP usage vary with the intensity of use and should be taken into account for policy making. The results provide evidence of lower GP usage outside major cities after controlling for health care needs, socioeconomic status and local health care characteristics. SLA with higher proportions of the population aged 0-9, more females, high social-economic status, more GPs, fewer specialists, and a fewer number of EDs were more likely to belong to the high GP-use class. This finding can help predict which areas will become high users of GP services and is important for the design of future health policies, particularly to ensure equity in access.

STUDY A3: DOES LIVING ALONE CONFER A HIGHER RISK OF HOSPITALISATION?

Introduction

There has been considerable growth in one person households worldwide over the last three decades [12,13] In Australia, the proportion of one person households has increased from 15.7% in 1976 to 24.3% in 2011 and is projected to represent 30.2% of all households in 2026. [14-16] An increase in one person households means less informal care is available within households, which in turn has important implications for the use of health care services.

There is mixed evidence on the relationship between informal care and formal care. Informal support may reduce the use of formal care due to care received within a household; thus, informal care is a substitute for formal care [17]. Despite considerable literature identifying the effect of informal care on formal health care, little is known about the relationship between living alone and hospitalisation.

This study examines the effect of living alone on hospitalisation in Australia, in terms of both the probability of hospitalisations and the length of stay once hospitalised.

Methods

Data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey is used for this analysis. The HILDA study tracks around 7,700 Australian households (around 20,000 individuals) yearly, starting in 2001. In 2009, a “health module” was included for the first time; this analysis focuses on this particular wave. The main variable of interest is the number of nights spent in hospital. An indicator for living alone is constructed based on an individual’s household type, available in all waves of HILDA. The household type variable consists of 26 sub-categories that can be combined into four groups,

- couple family (with or without children aged 15 or less, non-dependent children, other related or not related persons, and/or dependent students)

- lone parent family (with children aged 15 or less, non-dependent children, dependent students, and/or other related or not related persons)
- group or multiple-family household
- lone person household.

Individuals who report living in a single person household, i.e. group (4), are treated as living alone. People who belong to the other three household groups are treated as living in a multi-person household. The analysis only includes individuals aged 45 and above. After excluding observations with missing responses, 5,247 observations remain in the sample.

The analysis consists of a two-part model. The first part is a binary choice model (logit model) that analyses the probability of hospitalisation. The second part uses ordinary least squares (OLS) to analyse the length of hospitalisations, conditional on having been hospitalised in the past 12 months.

An individual's probability of being hospitalised is a function of household type, such as living alone or not, health status, demographic and income characteristics, and other consumption goods, such as insurance.

To reduce the risk of biased results, the analysis includes a large number of indicators of health status, including self-reported health status, presence of long-term conditions, mental health, and health status during childhood. This strategy should limit the possibility of possible confounding between living alone and hospital use. In dealing with the possibility of reverse causality, the analysis investigates the transition patterns of living alone across waves of the HILDA data.

Results

Figure 1 shows the relationship between age, gender and number of days in hospital according to living arrangements. It shows that for both males and females, the older generation tends to have longer hospital stays, conditional on being hospitalised, than younger individuals. Further, the average number of hospital nights is higher for single individuals than for those in multi-person households for the 45 and over group for both males and females. This pattern is distinct from that of the less than 45 year olds and adds support to the choice of subsample to be analysed.

Figure 1 The relationship between hospitalisation and living arrangements by age and gender – for hospitalised individuals of all ages

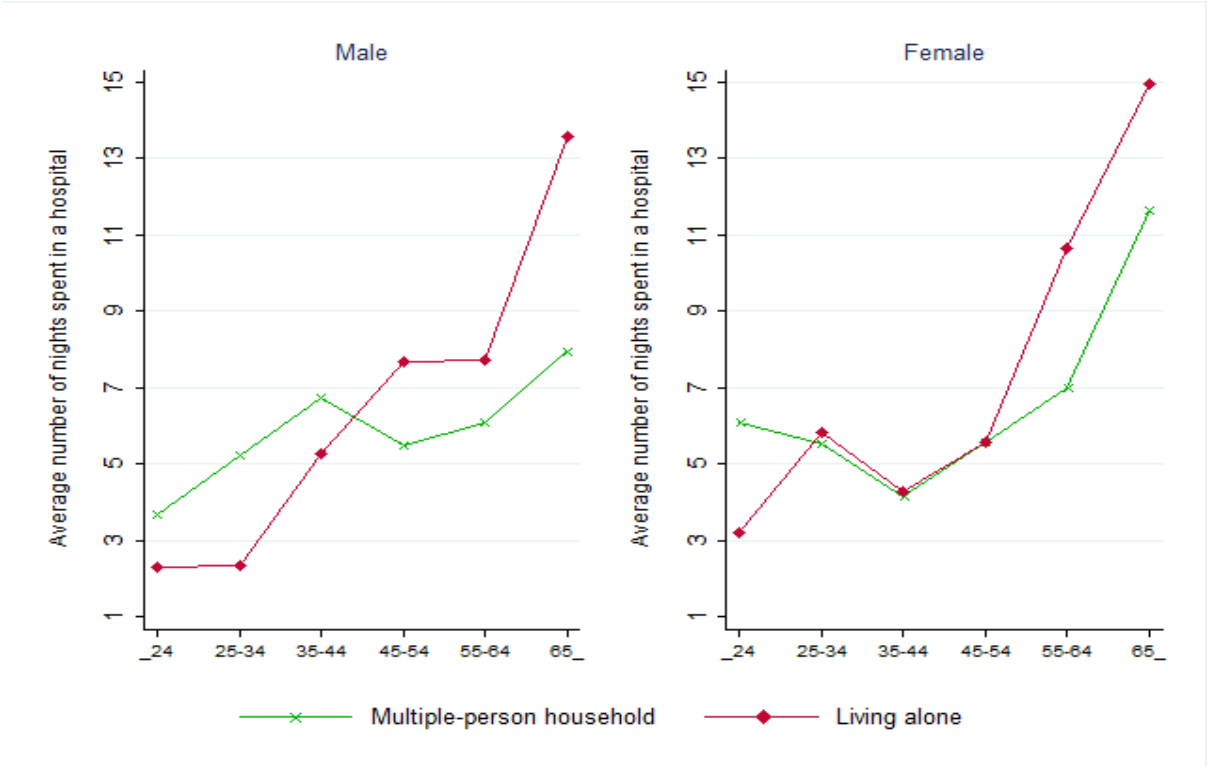


Table 5 presents the estimated parameters for the two-part model. The first two columns report the estimated coefficients and standard errors for the probability of hospitalisation, followed by those for the number of hospital nights once hospitalised in the last two columns.

Table 5: Estimation results for the two-part model – effect of living alone status

Variables	**Probability of hospitalisation**		**Number of hospital nights conditional on hospitalisation**	
Living alone	0.239**	(0.100)	3.768**	(1.790)
Self-reported health status (base is poor health)				
Fair health	-0.610***	(0.162)	-8.543***	(2.684)
Good health	-0.980***	(0.171)	-8.695***	(2.847)
Very good health	-1.362***	(0.194)	-9.427***	(3.389)
Excellent health	-1.212***	(0.259)	-9.241**	(4.677)
Have long-term conditions	0.411***	(0.096)	1.995	(1.818)
Employment status (base is out of labour force)				
Full-time employment	-0.249*	(0.134)	-1.255	(2.474)
Part-time employment	-0.052	(0.136)	-0.568	(2.496)
Constant	-2.412***	(0.476)	7.408	(8.507)
Observations	5,247		795	

*Note :Numbers in parentheses are standard errors. * p<0.10, ** p<0.05, *** p<0.01.*

Statistically insignificant coefficients not shown relate to age, gender, education, region and state of residence, private health insurance, mental health and health during childhood, employment status and income

Table 5 shows that living alone is positive and statistically significant in both models. From the first-part, the marginal effect, calculated at mean values of all covariates suggests that living alone leads to a 2.9% increase in the probability of hospitalisation. This is substantive considering that the mean probability of hospitalisation is around 15% of the sample, i.e. this marginal effect is almost 20% of the sample mean .In the second part, living alone is significantly and positively associated with the total number of nights in hospital, conditional on hospitalisation. Specifically, those who live alone have, on average, a total stay in hospital that is 3.8 nights longer than individuals living in multi-person households.

In other results, the study also found that Individuals who are living alone because of separation or divorce are more likely to be admitted to hospital than those who live with others, while no effect is identified for being widowed. All types of living alone lead to a longer length of stay once hospitalised than living with others, and the never married group has the longest hospital stay once hospitalised among all the household types. Results also indicate that for every year of living alone there is a 0.3% increase (marginal effect) in the probability of hospitalisation and 0.4 more days of hospital stay.

Discussion

The results show that living alone not only increases the likelihood of being hospitalised and but also greatly increases the length of stay in hospital. Worldwide rising health care costs are providing the impetus for better disease management as a means to constrain rising hospital use and expenditure. However, attention to social factors where these influence hospital use is also important. Our results show that services aimed at older singles to support them at home could also be effective .This means developing policy that goes beyond the primary care and community services currently available to a consideration of different types of out of hospital services and the funding to support them.

Part B: Access to care and out-of-pocket costs under Australia's Medicare system

INTRODUCTION

All health care financing, whether provided through government, social agencies or private providers, aims to ensure that individuals are not excluded from receiving costly health care when they need it. When patients face charges, their use of health services is lowered, with out-of-pocket (OOP) expenditures having a greater impact on the use of health care by those with less financial means. So at first glance it seems inconsistent to impose co-payments in a system set up to reduce barriers to use.

This would indeed be the case if all health care were equally appropriate and equally valuable. But it is not. Co-payments are widely used to provide a price signal that will reduce demand for those services that are less valued. The problem in health care is that consumers are not always good judges of what is most effective and may reduce their use of needed care. This finding, established by the RAND Health Insurance Study some three decades ago, [18] has not been seriously challenged. Further, co-payments that reduce costs in the short run may increase them in the longer term, as shown, for example, in the United States, where charges for pharmaceuticals result in patients not purchasing essential drugs, subsequently leading to hospital care. [19]

This part of the report draws on three separate studies.

- The first study shows how provider behaviour is a major determinant of the level of co-payments experienced by patients [20].
- The second study provides evidence on the OOP experiences of elderly Australians [21].
- The third study examines how access to health care differs according to socioeconomic status [22].

Together, these studies provide a deeper understanding of the phenomenon of out-of-pocket costs and their impact on equity.

STUDY B1: POORER PATIENTS FACE LOWER CO-PAYMENTS BUT FINANCIAL BARRIERS TO ACCESS PERSIST

Background

The Australian market for out-of-hospital services has unregulated doctor fees. The study by Johar et al [20] explains how doctors use this freedom and asks whether specialists determine their fees on the basis of their patient's income. This study followed up on the results from Johar [10] which showed that fee discrimination by patient income exists at the GP level. High-income patients pay on average 25% (AU$9.28) more than low-income patients for a standard GP consultation with the same GP. This gap is found despite the fact that in Australia patients can go to the GP of their choice.

Method

Building on Johar's [10] results, this study used the 45 and Up study; a large population survey involving more than 267,000 non-institutionalised people aged 45 and over in the state of New South Wales (NSW) in Australia [9]. The 45 and Up data has information on household income. The study is also linked to administrative data records and includes Medicare

claims data that provides the most accurate information available on the fees charged by doctors to individual patients, as well as the benefit paid by government through Medicare.

The fee charged by doctors has a direct bearing on the amount of co-payment faced by patients. Under the Medicare system, the patient pays the gap between the doctor's fee and the Medicare rebate as an out-of-pocket (OOP) cost for out-of-hospital services. That is, no supplementary private health insurance can be purchased for out-of-hospital services that are covered by Medicare.

The data has more than 530,000 specialist consultation claims per year. The study focuses on a relatively homogenous specialist service; the initial consultation with a specialist (MBS item number 104). The study identified 2,124 specialists who charge this item to at least one low and one high income patient. For the purpose of this study high-income patients were defined as those with household income in the top 25% of the income distribution, whereas low-income patients are those with household income in the bottom 25%. The study used person-level analysis to compute the fee gap between high-income patients and low-income patients. The fee gap is a measure of the variation of fees charged by each individual specialist.

Results

The results showed that around 80% of specialists charge higher average fees to their high-income patients when compared to their low-income patients. The mean fee for high-income patients was found to be $142.50 per consultation and the corresponding figure for low-income patients was $116.13, with an average fee gap of $26.38. Around 20% of specialists showed a fee-gap in excess of $50.

Doctor's fees above the Medicare benefit translate directly into patient co-payments. The average OOP costs for low-income patients is AU$47 and AU$74 for high-income patients. Indicating that despite the reduced fees for low income patients, there remain substantial financial barriers to access.

The results open up further questions about the mechanisms used by which specialists judge their patients' income. It would be unusual for a specialist to have direct knowledge of this. However, specialists may be able to obtain other information that could proxy income status. For example, it would be highly plausible for a specialist to know whether a patient is a concession card holder, or their address and postcode. In turn, this information could be used as a proxy for income. The study checked a number of such potential mechanisms. If these mechanisms were indeed used as the income proxy, the expectation is that the after accounting for the mechanism, the gap between low and high income would reduce substantially. For example, if concession cards are indeed the mechanism by which specialists proxy income, the expectation is that (i) the fee gap between high and low income patients with a concession card is very small; and (ii) the fee gap between high and low income patients without a concession card is very small.

It turns out that these mechanisms can only help explain a small amount of the fee gap. For example, for those with a concession card the fee gap between high- and low-income earners is AU$22. Whilst this gap is smaller than the overall gap of AU$26, it suggests that specialists use additional information to determine their fees.

Table 6: Results for mechanism checks - comparison of mean fee gaps

Patients' income status	Mechanisms	Mean fee	Fee gap	Number of specialists
High income	Non-concession card holders	$142.67	$8.25	652
	Concession card holders	$134.42		
Low income	Non-concession card holders	$117.96	$6.03	
	Concession card holders	$111.93		
High income	Aged less than 65	$144.09	$9.03	1,303
	Aged 65 or over	$135.06		
Low income	Aged less than 65	$126.05	$14.34	
	Aged 65 or over	$111.71		
High income	Have private health insurance	$140.86	$0.20	1,134
	No private health insurance	$140.66		
Low income	Have private health insurance	$117.40	$6.38	
	No private health insurance	$111.02		
High income	Employed	$142.41	$2.71	1,224
	Unemployed	$139.70		
Low income	Employed	$128.67	$15.27	
	Unemployed	$113.40		
High income	Top quantile of SEIFA for residential areas	$146.10	$0.91	648
	Bottom quantile of SEIFA for residential areas	$145.20		
Low income	Top quantile of SEIFA for residential areas	$116.81	$3.19	
	Bottom quantile of SEIFA for residential areas	$113.62		

Source: Johar et al 2016 [20]

Discussion

In an unregulated fee-setting environment the vast majority of specialists charge higher fees to higher income patients. These findings are consistent with profit maximisation behaviour among specialists, given that low-income patients are more price sensitive than their wealthier counterparts (see for example [23-25]) but are also consistent with notions of fairness where specialists charge lower fees to those on low incomes. Despite this OOP costs remain substantial when compared to other health care providers such as GPs. This, in part, reflects previous research that shows high income earners are greater users of specialist care than low income earners [26]. There might be a case for devising incentives for

specialists to charge low-income patients lower fees, similar to those in the GP market, to help remove some of these barriers.

STUDY B2: HIGHER CO-PAYMENTS LEAD TO GREATER FINANCIAL STRESS AMONG THOSE WITH MULTIPLE CHRONIC DISEASES

Background

High out-of-pocket (OOP) costs on health care may leave insufficient income for other necessities, and impede access to health care. In turn, this may affect health status and quality of life. Previous research showed that the total number was an important predictor of OOP expenditure and that people with multiple chronic conditions also tended to be from lower income [27].

Method

Islam et al [21] examined OOP expenditures for elderly people with chronic conditions. The aim of the study was to identify the impact of chronic conditions and comorbidities on the level of OOP expenditure. The study focused on whether different combinations of chronic diseases are associated with higher burdens of health care costs. The study also examined the burden of OOP expenditures relative to income for 4,574 senior Australians.

Study participants were asked about their diagnosis of eleven different chronic conditions such as cancer, heart disease, diabetes, depression and anxiety. In additions, the survey asked participants to identify the total amount of own money they had spent on both medical expenses and nonmedical expenses (e.g. transport, home care) relating to health care during the previous three months.

Results

The study found that in the previous three months, average OOP expenditure was AU$353. Medications and medical service expenses were the major drivers of these costs. People with greater number of number of conditions (and some specific conditions) are more likely to face substantial OOP expenses. Fourteen percent of participants spent more than 10% of their income on health-related expenses, and those on low-incomes face a higher burden than those who are relatively well-off. Patients with cancer or diabetes were more likely than others to be part of the group that faced this heavy burden.

Discussion

The study highlights that despite the presence of a universal health insurance system, Australian patients remain vulnerable and exposed to high OOP costs and substantial financial risks, particularly those patients with multiple chronic diseases and low incomes.

In the current economic environment, policy advisers face increasing pressures to shift health care responsibilities away from tax-based funding and towards individuals. Within the context Australian health care system this is likely to place greater risks on affordability as current policy settings to not provide sufficient financial protection. This implies that further policy changes are needed that can better target vulnerable populations with a high number of chronic diseases, specific conditions such as cancer, as well as those on low incomes.

STUDY B3: INCOME REMAINS A MAJOR DETERMINANT OF HOW PATIENTS NAVIGATE THE HEALTH CARE SYSTEM AFTER THE DISEASE ONSET

Background

For many health conditions there is the potential for health care services to substitute for one another. This presents a possible explanation for previous research which finds high income groups are greater users of specialists care, whereas lower income groups are greater users of primary care physicians or general practitioners (GPs), even after adjusting for health care needs. Fiebig et al [22] investigated how utilisation of primary care, specialist care and ED care (and the mix between the three) changes in response to a change in health need. The primary focus of the study was to investigate whether the degree of substitution differed by socioeconomic status.

Previous studies have examined how different health systems around the world perform in terms of health care use by socioeconomic status. Evidence for Australia presented in van Doorslaer et al. [26] is consistent with the overall conclusion from this body of work that after accounting for health care needs, the use of specialists is higher among high income patients compared to low income patients. For primary care, there is less consensus within the international literature where there is some evidence of an income gradient but in such cases the effect is much smaller than that found in specialist care. Conversely, in some countries the association is actually negative and this is what van Doorslaer et al. [26] find for Australia. After controlling for health care needs, lower income Australians are more likely to consult a GP than their wealthier counterparts.

Fiebig et al [22] investigated the utilization of primary and specialist care and how the mix between the two alters in response to a change in health need. Specifically, they sought to answer several questions:

- What is the role of SES-related in explaining substitution between primary and secondary care following the onset of specific health conditions.
- Does Emergency Department (ED) substitute for primary care and are any effects that are found relate to SES?
- Do health shocks impose inequitable cost burdens?

Method

The analysis uses a rich data set constructed by linking a large survey of the population aged 45 years (The Sax Institute's 45 and Up study) or more with multiple years of comprehensive administrative health utilisation data. The onset of diabetes and heart disease as the scope for substitution is different between these two conditions. In the case of adult onset (type 2) diabetes there is more scope for effective management within the primary care system [28] while for heart disease, initial treatment is more likely to involve a specialist.

The study uses self-reported information on the current age and the age when various chronic conditions were first diagnosed in the survey data. This enables Fiebig et al to identify the year of onset and construct a time variable that denotes the 'тth' periods before or after the onset of the specified conditions. The final sample was 8,759 and 8,195 individuals for the Diabetes and Heart subsamples, respectively. The availability of multiple years of administrative records provides panel data for the different shock-specific subsamples and can control for individual effects using a fixed effects (FE) approach. Utilization measures were tracked before and after the onset of the health shock. By

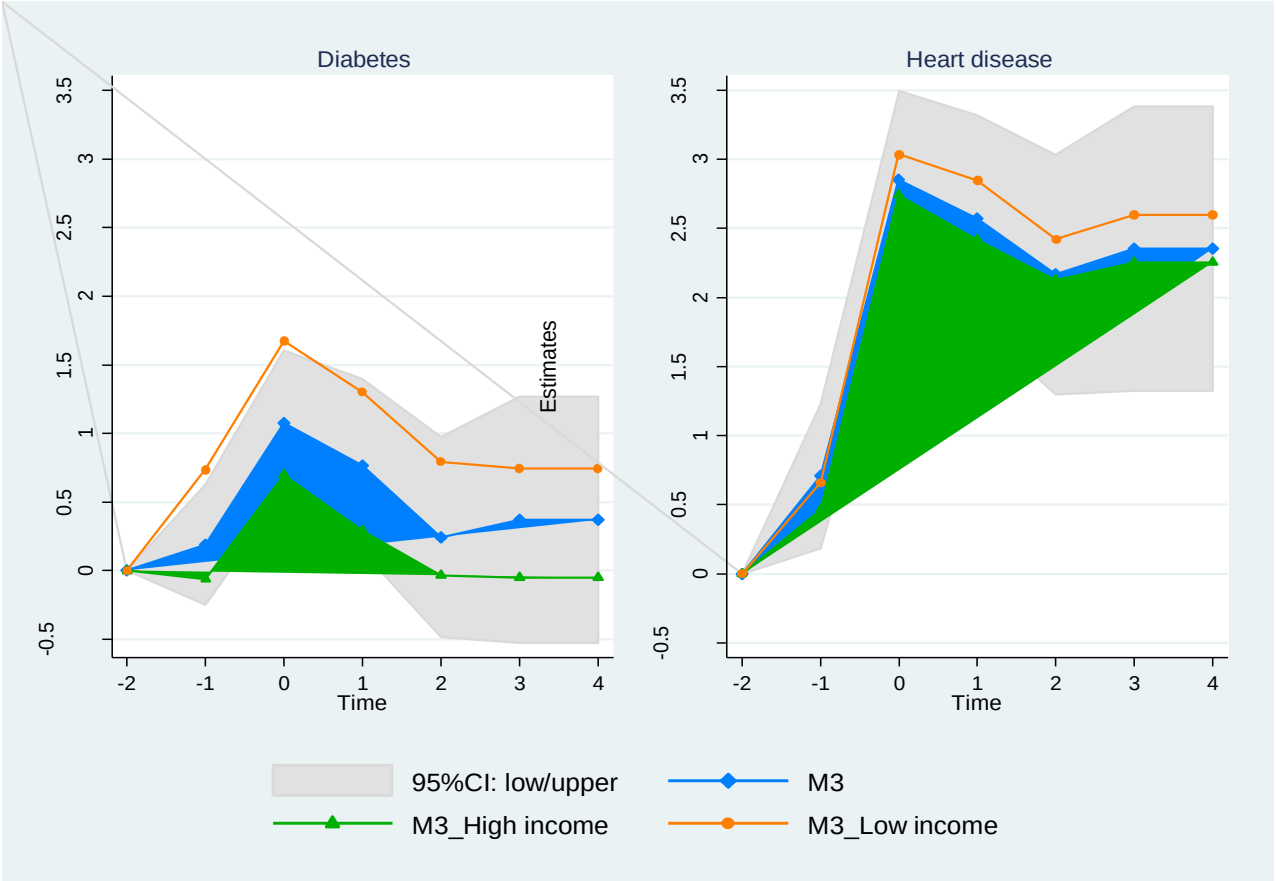
controlling for individual fixed effects the study controls for all time invariant heterogeneity, at least some of which is related to the underlying health needs of the individual.

In the study, high income individuals are defined as those with household income of $40,000 or more in the survey year and individuals with income below $40,000 are in the low income group. A binary variable is used for the location of residence, with 1 for living in a major city and 0 for living outside a major city (including inner regional, outer regional, remote, and very remote areas). Age that may help capture an individual's health status is also included.

Results

The results show interesting and significant patterns emerge in the temporal changes in usage around the shock and in the impact of SES variables. Figures 1 and 2 provide estimates for GP and specialist (SP) visits. Each figure has the same structure comprising two panels corresponding to the two health shocks. Each panel provides estimates for the overall average temporal pattern of changes in visits together with those for low and high income. Also included is the 95% confidence interval for the average response. Figure 2 illustrates these estimates for GP visits. The horizontal axis represents Time (τ) in years with Time =0 corresponding to year of onset. The vertical axis represents estimates of the number of visits per annum and these estimates represent changes relative to the Time =-2 year base.

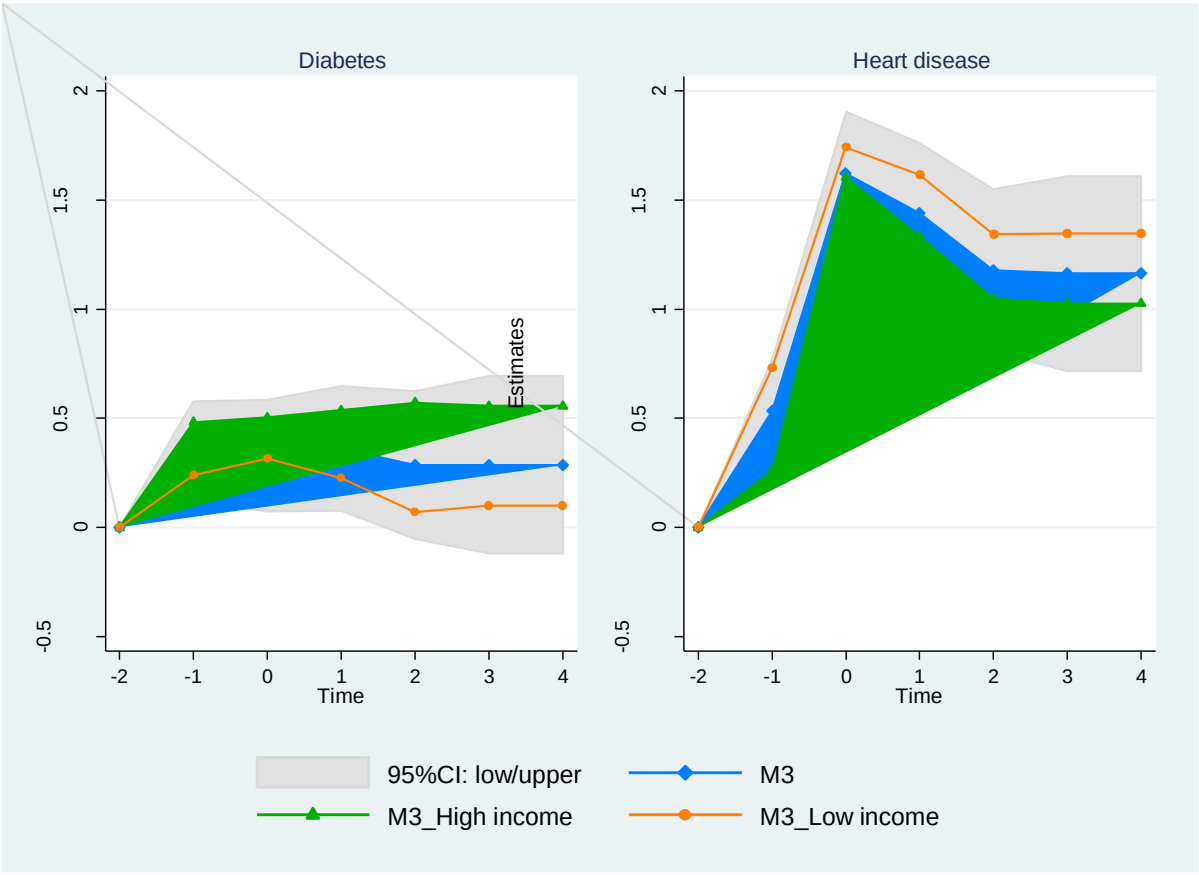
Figure 2: GP visits: High income versus low income



The general pattern in Figure 1 is the same for both income groups: there is a small pre-shock increase, followed by a large onset effect that diminishes thereafter. However, the *heart* shock increases are much bigger than those for the *diabetes* shock. There is an income differential consistent with pro-poor GP use for diabetes.

If substitution exists then it is expected that for the poor, larger increases in GP use will be offset by smaller increases in SP use and vice versa for the rich. Moreover, the expectation is that this is more likely to occur for the *diabetes* group where there is more discretion in the involvement of the specialist than in the case of heart disease. This is what was found in Figure 3.

Figure 3: SP visits: High income versus low income



While increases in SP visits for *diabetes* are modest, there is evidence of substitution with the increases for those on high incomes being greater than those on low incomes; in the order of 0.2 to 0.5 more visits. For larger τ the differences are statistically significant. For SP visits for *heart disease*, the increases in use are larger for the poor than for the rich. The differences between income groups are relatively modest (relative to overall level of changes although similar in magnitude to the *diabetes* SP differences) and except for τ=-1 are not statistically significant.

In the case of ED use, the study found that the estimated impacts of both health shocks are small and the confidence interval for the average always covers zero for both groups. There was no evidence of the poor, or in fact anyone, increasing their non-urgent ED visits after either shock.

Discussion

The study found that health care use increases dramatically for both types of health shocks. The study also found substantial differences in the type of care used according to income group and type of health shock. For diabetes, low income patients increase their use of GP services relatively more than high income groups, whereas high income patients increase specialist use by more than their low income counterparts. Indeed, for the low income group, there is a small initial increase in the number of specialist visits at the time of onset but then patterns of specialist visit revert back to their pre-shock levels. These results are consistent

with the notion that low income patients substitute GP for specialist care, whereas the high income patients shift their care towards a greater reliance on specialists. The extent to which this represents an access problem depends on the degree to which GP care and specialist care are clinically substitutable or are complementary.

What is clear from the diabetes results is that low and high income patients are navigating very different pathways for their care. Furthermore, affordability appears to be a major driver of the chosen pathway. The Australian Health System protects low income patients from higher OOP costs for GP care but not specialist care. For heart disease, there is a substantial increase in GP and specialist visits although there are few differences between income groups. In line with our expectations, the degree of GP and specialist substitution is considerably less for heart disease than diabetes. The results also indicate that both low and high income groups face substantial increases in OOPs. Although the OOPs faced by the poor are lower, this could represent a much greater burden in terms of affordability.

The results point to the need to re-examine the use and affordability of health care pathways, rather than focus on the use and affordability within a particular health care sector (such as primary care). Such an examination could deliver greater insights into equity of access in the sense that equal needs would receive equivalent treatment bundles of care. Such bundles of care should, in turn, be based on the most effective and efficient treatment pathway instead of a pathway that is chosen through the complex (and potentially distortionary) myriad of OOP costs.

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