Reducing physician requirements through practice-level productivity improvements: the Australian experience in primary care.

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Acknowledgements
Funding for Anthony Scott was provided through an Australian Research Council Future Fellowship (FT0991296). MABEL is supported by a National Health and Medical Research Council Health Services Research Grant (454799) and the Commonwealth Department of Health and Ageing.

Abstract
Reforms designed to influence the productivity of the health workforce in Australia are fairly recent and have not been evaluated. These include an increasing role for non-medical health professionals. Primary care has witnessed the most pronounced changes in recent years, as the average size of GP practices has increased, and the involvement of non-medical professionals and use of IT have also increased sharply. The aim of this paper is to examine the association between a range of GP and practice characteristics and variations in GP productivity, defined as the number of patients seen per week. We use data from 2,730 GPs from the first Wave (2008) of the MABEL longitudinal survey of doctors. Preliminary results suggest that employing an allied health professional, working longer clinical hours, more years of experience, and bulk-billing (charging patients a zero price), are all associated with high average GP productivity. Female GPs, longer consultations, and being qualified in Australia, are associated with lower levels of GP productivity. This paper provides some preliminary but important empirical evidence of the practice-level determinants of GP productivity in Australia. Further research is required to examine these relationships in more depth, and before they can be interpreted as evidence about the impact of these factors on future numbers of GPs.

Introduction

There are no routinely used measures of doctor productivity in Australia. Indeed, the term 'productivity' can mean a number of different things. The different concepts of efficiency in economics combine the attainment of some set of objectives with limited resources or inputs to meet them. Each definition varies depending on whether a producer or consumer perspective is taken, and on whether the objectives to be met are those of the individual worker, firm, industry, or consumer or society as a whole. Productivity is related to the objectives that need to be met. It usually refers to outputs, such as the number of visits or services performed, but can be defined in terms of outcomes, that is the extent to which outputs (the number of visits or services performed) are valued by consumers or society as a whole. The 'valuation' of outputs, that is how important they are to patients and society, is usually determined by markets, and so in health care where markets fail and demand is difficult to determine, the value of what doctors do can only be demonstrated through the explicit measurement of the effects their activities on costs and health outcomes (e.g. economic evaluation alongside randomised controlled trials or longitudinal observational studies).

As with most countries, health improvements are not routinely measured in Australia, and the measurement of productivity is determined by what can be most easily measured, usually outputs such as numbers of services or visits or mortality rates. In some cases, the measurement of adverse events in hospitals are often used as indicator of quality of care, as are 'proxies' measures of quality such as HbA1c tests for diabetes. The issue is that the relationships between these various measures are not straightforward, and there are often trade-offs between increasing quality and health outcomes, with throughput and costs. This is why economic measures of efficiency, which combine measures of outcomes and costs or inputs, make such trade-offs explicit.

A previous paper presented to this conference examined trends in doctor productivity in Australia, as measured by the number of services funded by Medicare, and outlined a number of problems in using this type of data (Scott, 2006). This, and other research (McRae, 2008), showed a fall in utilisation and rise in copayments after 2001, and

suggested that this was due to a shortage caused by reductions in supply of GPs as a result of falling average hours of work for doctors and the effect of the collapse of medical indemnity insurance around this time. However, health care costs continued to rise as doctors charged more for each service, even though utilisation fell. Since that time and through additional funding through the Medicare Benefits Schedule, utilisation has increased and prices charged have fallen.

Such aggregate data can only examine trends in utilisation and not its determinants. The measurement of productivity at a practice-level is more problematic, and one has to rely on specific surveys and primary data collection, due to the current inability to access unit-record provider-level Medicare data.

The aim of this paper is to review and examine the determinants of doctor productivity in Australia, with a particular focus on General Practitioners (GPs) and the role non-medical health professionals. This sector has experienced the most changes in recent times. The proportion of solo general practices has fallen from 26% in 1990/1 to 8.2% on 2006/7 (Charles et al., 2004, Britt et al., 2009). The proportion of GPs working in practices with more than 5 GPs increased from 35.8% in 1999/00 to 56.1% in 2006/7. There has also been growth in the number of practice nurses being employed in general practices, and a growing role for allied health professionals. The number of practice nurses in Australia has increased from 3,255 in 2003/4 to 8,575 in 2007/8, a rise of 163% (PHCRIS, 2009). In 2009, it was estimated that 57% of all general practices employed a practice nurse (AGPN, 2009). The proportion of GP consultations involving a practice nurse increased from 4.2% in 2005/6 to 6.4% in 2008/9, most of which was related to additional funding through the Medicare Benefits Schedule for practice nurses being involved in wound management, immunization, or cervical smears (Britt et al., 2009). Medicare data show that the number of services claimed involving a practice nurse increased from 1.2% of all GP attendances in 2003/4 to 4.8% in 2008/9 (Medicare, 2010). However, these figures will underestimate of the contribution of practice nurses.

Other studies have shown that only 42% of practice nurse consultations were directly funded through Medicare, so their contributions to practice activities and team functioning are often much greater than shown by Medicare data and data that focus on only doctors activities (Phillips et al., 2009); (Joyce and Piterman., 2009, Joyce and Piterman, 2009).

These changes have been accompanied and supported by substantial changes in the use of IT, the existence of regional primary care organisations (Divisions of General Practice), and a number of additional funding initiatives in primary care. Questions remain as to the impact of these changes on costs and health outcomes, and how they influence GP productivity.

Where non-medical health professionals undertake tasks that doctors undertake, substitution will allow doctors to undertake other activities. Given excess demand for health care, technological advances and the possibility of supplier-induced demand, doctors are unlikely to reduce their working hours (though this cannot be ruled out) as a result of such substitution. On the cost side, there are therefore unlikely to be cost savings from reductions in GPs time. Costs overall are likely to increase if new non-medical health professionals are trained and hired. The question then is whether the increase in costs to the system are worth the additional benefits. The additional benefits will include an increased throughput of patients (patients per week) which may reduce waiting times and improve access to health care. Population health will be higher as more patients are treated per unit of time, assuming that the additional benefit to each additional patient seen is positive, though the relationship between more patients being treated and health outcomes and quality of care is also uncertain, as each additional patient treated may have a lower 'need' (capacity to benefit) from health care – they may have better off going to a pharmacy for a minor ailment. Doctors would presumably be happier if substitution allows them to focus on more 'interesting' cases and patients, rather than less interesting ones, and in turn this may influence recruitment and retention if job satisfaction is higher. Doctors may also spend more time on non-clinical medical activities, such as management, committee or academic work.

If patient throughput does not increase and consultation length increases, then this may improve quality depending on the value of each additional minute, which will decline at some point, and so substitution could lead to higher costs with no increase in quality of care or outcomes for patients. However, there is evidence that consultations lengths have remained stable over the last 10 years (Britt et al., 2009).

Recent policy context

Australia has only recently embraced the role of non-medical health professionals in improving productivity. In recent years, a number of major policy announcements and decisions have been made that focus on the role of non-medical health professionals in the Australian health care system. Since a report in 2005 by the Productivity Commission about the health workforce, the Council of Australian Governments (COAG) has been working to support a range of initiatives on health workforce reform and innovation, including supporting local projects of skill mix changes and the development of new roles. Separate to these reforms, a number of other initiatives are focusing on new roles, such as physician assistants in Queensland, the Better Skills for Better Care program in Victoria, allowing nurse practitioners, midwives, and a range of allied health professionals to access the national Medicare Benefits Schedule, funding of general practice nurses through a number of schemes, and proposals to prescribe medications for some non-medical health professionals. The innovations and projects cover the full range of sectors, including hospitals, aged care, and primary and community care. There are also a range policy initiatives specific to non-metropolitan areas, where health workforce shortages are particularly severe. These changes are also being supported through additional funding for training places, and by providing the infrastructure and regulatory support for new and changed roles to develop.

However, many of these initiatives are either new and are still being evaluated, or have not yet been legislated, or have been in existence for several years but have not been evaluated at all. There is therefore an absence of evidence about the effects of these changes. Although valuable research capacity has recently been established, primarily through the Australian Health Workforce Institute and the National Health Workforce

Research and Planning and Collaboration, the data infrastructure to underpin such evaluation is still being developed, and there is no experimentation planned and so the effects of these reforms on costs and patients health will be difficult to evaluate. The extent to which such reforms improve the productivity of doctors, and the health system more generally, is also uncertain.

The first section of the paper will discuss the measurement of doctor productivity in Australia. Previous research from Australia that has examined the role of non-medical health professionals on doctor productivity will then be reviewed. Finally, data from the MABEL longitudinal survey of doctors will be used to examine the association between the employment of nurses and allied health professionals and the productivity general practitioners.

Determinants of GP productivity in primary care

There are a range of factors that are likely to influence productivity of doctors. Differences in productivity between GPs are likely to be due to the practice style and preferences of the GP, the extent to which the GP works with other GPs and health professionals in the practice and how this happens, and the use of IT (Phillips et al., 2009). GP characteristics such as gender, age, country of graduation, Fellowship qualifications, and rural location have been shown to be related to consultation length (Britt et al., 2005).

In addition, the extent to which GPs and the practice team adopt and use clinical evidence-based guidelines will also play a role. Productivity will be influenced by demand side factors, such as patient case-mix and complexity, age-gender composition, socio-economic status, and the effect of co-payments. Prices charged may also influence demand and the number and type of patients seen. The role of regional primary organisations will also play a role (Scott and Coote, 2009). Health system factors that influence productivity include the way GPs are paid, including the use of performance pay, and other differences in how funding is delivered to GPs (Scott et al., 2009).

A key economic determinant of practice productivity and efficiency is economies of scale. This is where average cost per patient falls as the number of patients seen rises because the fixed costs of practices are spread amongst a larger number of doctors and patients. The peer support and team working that is possible in larger practices may also lead to higher quality of care. However, diseconomies of scale might exist beyond a certain level of output, and average cost per patient starts to rise as practices get 'too large' and encounter difficulties in co-ordination, communication and continuity of care which could lead to a lower quality of care and/or higher average costs (managerial diseconomies of scale). Economic theory therefore suggests that the most efficient practice is that where average costs are lowest, and suggest an 'optimal' size. Although the concept of economies of scale relates specifically to costs, it also suggests that there is an important relationship between the size of a practice and other outcomes, such as throughput, quality of care, and revenues. This is particularly relevant to the policy of introducing GP Super Clinics in Australia, and what size they should be.

There have been only a handful of studies in Australia using various types of data that have, at a practice level, attempted to examine the determinants of a number of different aspects of doctor or practice-level productivity or performance.

In examining the effect of Divisions of General Practice on Division Performance, Scott and Coote found that practice size (number of FTE GPs) had a statistically significant effect on the extent to which practices claimed performance payments in diabetes and asthma, but not for cervical screening (Scott and Coote, 2009), after controlling for a number of factors using longitudinal data on Divisions of General Practice. A recent study also found that willingness to host medical students was related to practice size (Thomson et al., 2009)

Another more detailed literature moves beyond practice size and attempts to examine the nature and role of organisational capacity of general practices, specifically to provide high quality of care in chronic disease. Practices require a higher level of fixed costs with

respect to IT support, disease registers, good management, training, and team working, which can only be achieved in larger practices (Proudfoot et al., 2007, Beilby et al., 2004). Harris found that job satisfaction of all practice staff was not related to practice size, once other factors including 'team climate' had been controlled for (Harris et al., 2007). These studies collected very detailed data at a practice level, and have examined variation in the functioning of teams, rather than the effect of their size and composition.

Data

To examine the association between productivity and practice-level factors, we use data from the Medicine in Australia: Balancing Employment and Life (MABEL) longitudinal study of doctors. MABEL is a prospective cohort study of workforce participation, labour supply and its determinants among Australia doctors. The population is all doctors providing clinical medical services in Australia. Data collection for the first wave was conducted from June to December 2008 to establish the baseline cohort for the study and subsequent surveys will be administered annually until at least 2011. The first wave survey questionnaire covered topics such as job satisfaction and attitudes to work; characteristics of work setting (public/private hospital, private practice); workload (hours worked, on-call); finances (income, income sources); geographic location; demographics (including specialty, qualifications); and family circumstances (partner and children).

The methods of the study and characteristics of the baseline cohort are discussed at length elsewhere and are briefly mentioned here (Joyce et al., 2010). The sampling frame of the study is the Australian Medical Publishing Company's (AMPCo) Medical Directory, a national database managed by the Australian Medical Association (AMA).[1] In the first wave, a total of 54,750 doctors across four broad groups within the clinical medical workforce were invited to participate. The four groups are general practitioners; medical specialists; specialists-in-training; and hospital non-specialists. The overall response rate for the first wave of the study is 19.36%, a total of 10,498 doctors. The baseline cohort

[1] The AMPCo database is updated regularly using a number of sources. In addition to receiving updates directly from doctors, AMPCo also conducts biannual telephone surveys, checks medical registration board lists, AMA membership lists, and Medical Journal of Australia subscription lists to maintain accuracy.

consists of 3,906 GPs (which includes 226 GP registrars), 4,597 specialists, 1,072 specialists-in-training and 924 hospital non-specialists. The cohort was found to be nationally representative with respect to age, gender, geographic location and hours worked (Joyce et al., 2010).

This paper uses data on GPs, excluding GP registrars. The dependent variable is the number of patients seen per week in private practice by the GP. The key independent variables of interest are the number of practice nurses and the number of allied health professionals employed by the practice. Other independent variables included GP characteristics (hours spent in direct or indirect patient care per week, consultation length, female, qualified in Australia, Fellowship, number of postgraduate qualifications, temporary resident, years of experience since graduation, self-employed), practice characteristics (whether an all female practice, whether they do after hours work or on call, the extent to which the GP agrees that the patients they see have complex health and social problems, that running their medical practice is stressful, and that IT systems used are helpful). Regional characteristics included the 2006 Index of Relative Socio-economic Disadvantage in deciles in GPs' work location, state and territories binary variables as well as a three-category measure (*Major city*, *inner regional* and *others*) of remoteness based on the Australian Standard Geographic Classification (ASGC).

Ordinary least squares regression is used to examine the association of the above factors with the number of patients seen per week. Given that GPs are grouped into geographic areas, we use a fixed effects model that tests and controls for the correlation between the productivity of GPs in the same geographical area. Such correlations will reflect factors that influence productivity that are the same for every GP within their Statistical Local Area, such as patient demand, socio-economic factors, rurality and access, and number of other general practices and health services in the area. Using fixed effects rather than random effects (equivalent to a 2-level multilevel model) has the advantage of allowing the unobserved area-level factors to be correlated with the independent variables.

Results

Descriptive statistics are shown in Table 1. We restricted the sample to respondents who worked between 4 and 100 hours per week and had worked at least 26 weeks in the past year, and who saw less than or equal to 300 patients per week. This left 2,798 GPs with non-missing values for the variables included in the models. GPs saw an average of 113 patients in their last usual week at work, with a distribution shown in Figure 1.

There was an average of 6.3 GPs per practice. 77% of GPs worked in a practice that employed at least one nurse, and 37% of GPs worked in a practice that employed at least one allied health professional. GPs were in practice that employed an average of 2 practice nurses, and just over 1 allied health professional. 71% of GPs agreed that the IT systems they used were helpful.

The main results are shown in Table 2. All models used robust standard errors due to evidence of heteroskedasticity. Figure 1 shows that productivity was not normally distributed. The most appropriate transformation to a normal distribution was to take the square of productivity, though the regression results were very similar in terms of statistical significance. Results are therefore presented on the untransformed data for ease of interpretation. The use of fixed effects were appropriate, and so we discuss the results of the second model in Table 2. The fixed effects models show differences in the magnitude of the associations compared to OLS, suggesting that unobserved area-level factors are correlated with the observed factors included in the model. All coefficients are expressed in terms of the number of patients seen per week.

The variable with the most explanatory power was the ratio of nurses to GPs, and the whether or not the GP was in a practice that employed an allied health professional. The ratio of nurses to GPs was significant in the OLS model, but not in the fixed effects model (p value= 0.08). There was a strong association with the employment of an allied health professional and GP productivity. The employment of an allied health professional was associated with an increase in productivity of 6.4 patients per week.

Two key determinants of the number of patients seen per week are the number of hours worked in private practice and consultation length. Every additional hour worked is associated with an increase of 2.5 patients per week. Each additional minute added to a consultation is associated with a reduction in GP productivity of 2.4 patients per week.

In terms of GP characteristics, female GPs see 11.2 fewer patients per week compared to male GPs. GPs who attended an Australian medical school see 8.3 fewer patients per week compared to those who graduated overseas. There was no effect of qualifications and Fellowship on productivity. Each additional year of experience increased productivity by around 0.9 patients per week up to around 24 years of experience, beyond which productivity falls. For example, those with 6 years experience saw an additional 4.6 patients per week, 24 years experience saw an additional 10.2 patients per week, and 30 years experience an additional 9.3 patients per week.

Some demand side factors also played a role. Consultation length will control for case-mix and complexity of patients to an extent. GPs who bulk-bill patients (i.e. charge them a zero price) see more patients per week. For example, GPs who bulk-bill 10% of their patients see an additional 1.9 patients per week, whilst GPs who bulk bill 90% of their patients see an additional 17.1 patients per week. The fixed effects model controlled for all observed and unobserved area-level factors influencing productivity, explaining the difference in the statistical significance between the OLS and fixed effects model for the state dummy variables, socio-economic status, and rurality.

Discussion

Although there is much past and ongoing policy change in Australia that can potentially influence doctor productivity, there is little evidence of the nature and magnitude of these effects. Although there are many examples of local innovation, the most pronounced changes at a national level have occurred in primary care, which has experienced a sharp increase in the involvement of practice nurses and allied health professionals, and a gradual increase in average practice size.

Defining GP productivity as the number of patients seen per week, these preliminary results show a number of factors that are associated with GP productivity. The models control for key observed factors that influence practice productivity, and also control for all unobserved factors within each geographic area that influence GP productivity. Having an allied health professional, working longer clinical hours, more years of experience, and bulk-billing, are all associated with high average GP productivity. Female GPs, longer consultations, and being qualified in Australia, are associated with lower levels of GP productivity.

The strong negative effects for female GPs has implications for the increasing proportion of women entering medicine, and the effect on productivity. This is statistically significant even after controlling for hours worked, consultation lengths, and experience (which accounts for time spent out of the workforce). This may reflect differences between male and female GPs in working styles and preferences, involvement in practice management and communication with team members.

These preliminary results provide an indication of the key likely determinants of GP productivity. They suggest that trends of falling average hours of work and a higher proportion of women in medicine may reduce productivity, but that these may be partially offset by a more experienced workforce and increasing participation of non-medical health professionals.

The paper uses number of patients seem per week, and so does not examine the effect of the above factors on other dimensions of productivity, such as quality of care, health outcomes or costs.

The results reflect associations and not causal effects, and so should be treated with caution. In a cross-section, there is likely to be reverse causality. A high number of patients seen per week may influence the decision to employ a practice nurse or allied health professional. In addition, practice or GP- specific unobserved factors may influence the decision to hire additional staff, and it may be these unobserved factors that

lead to the associations shown in the models, rather than be a causal effect of the existence of additional staff. The fixed effects model controls for area-level unobserved factors. The longitudinal element in MABEL will enable us in the future to control for GP-specific unobserved factors.

This paper provides some preliminary but important empirical evidence of the practice-level determinants of GP productivity in Australia. Further research is required to examine these relationships in more depth, and before they can be interpreted as evidence about the impact of these factors on future numbers of GPs.

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Figure 1. Histogram of the distribution of number of patients seen per week

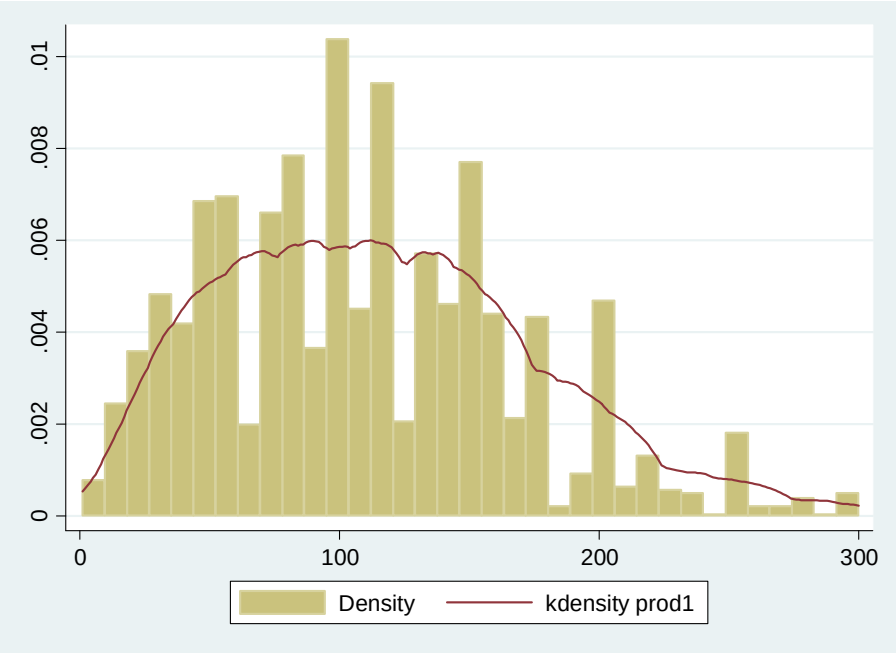

Table 1. Descriptive statistics

Variable	Mean	sd	Min	Max
Number of patients seen in last usual week in private practice	112.77	57.77	1	300
Whether practice employs a nurse (=1)	0.77	0.42	0	1
Number of nurses	1.99	1.86	0	15
Number of nurses per GP	0.34	0.4	0	10
Whether a practice employs an allied health professional (=1)	0.37	0.48	0	1
Number of allied health professionals	1	1.87	0	20
Number of allied health professionals per GP	0.18	0.41	0	7.5
Hours per week in private practice	37.3	14.38	0	100
Consultation length (mins)	16.45	5.96	0	90
Female (=1)	0.37	0.48	0	1
All female practice (=1)	0.06	0.23	0	1
Australian med sch (=1)	0.77	0.42	0	1
Fellowship of Colleges (=1)	0.58	0.49	0	1
Number of other postgraduate qualifications	0.53	0.76	0	4
Temp visa (=1)	0.02	0.16	0	1
Medical practice experience (years)	25.49	10.65	3	63
Square of medical practice experience	763.29	597.62	9	3969
Self-employed (=1)	0.52	0.5	0	1
Does hospital work (=1)	0.21	0.41	0	1
Does after hours and oncall (=1)	0.53	0.5	0	1
Practice is stressful most of the time (=1 if agree)	0.37	0.48	0	1
IT systems helpful (=1 if agree)	0.71	0.45	0	1
Patients have complex health and social problems (=1 if agree)	0.67	0.47	0	1
Percent of patients who are Bulk-billed	60.74	31.03	0	100
Victoria	0.25	0.43	0	1
Queensland	0.2	0.4	0	1
South Australia	0.09	0.28	0	1
Western Australia	0.09	0.29	0	1
Tasmania	0.02	0.15	0	1
ACT	0.01	0.12	0	1
Northern Territory	0.01	0.08	0	1
ASGC: Inner regional (Excl: Maj City)	0.17	0.38	0	1
ASGC: Others	0.08	0.27	0	1
SEIFA: Std Ind Disadv	10.15	0.61	6.5	11.49

Table 2. Factors influencing GP productivity: regression results

	OLS β (95% CIs))	**Fixed effects** B (95% CIs)
Ratio of practice nurses to GP	3.51*	4.28
	(0.07 - 6.95)	(-0.42 - 8.99)
Whether a practice employs an allied health professional (=1)	4.76**	6.42**
	(1.73 - 7.79)	(3.16 - 9.68)
Hours per week in private practice	2.54**	2.52**
	(2.42 - 2.67)	(2.38 - 2.66)
Consultation length (mins)	-2.66**	-2.42**
	(-3.08 - -2.24)	(-2.68 - -2.15)
Female (=1)	-10.72**	-11.23**
	(-13.79 - -7.65)	(-14.83 - -7.63)
All female practice (=1)	3.00	4.42
	(-2.21 - 8.22)	(-2.29 - 11.13)
Australian med sch (=1)	-8.50**	-8.27**
	(-12.25 - -4.75)	(-12.26 - -4.28)
Fellowship of Colleges (=1)	-0.62	-1.63
	(-3.73 - 2.49)	(-4.98 - 1.72)
Number of other postgraduate qualifications	-1.92*	-1.6
	(-3.61 - -0.23)	(-3.61 - 0.40)
Temp visa (=1)	-4.14	-1.94
	(-15.65 - 7.37)	(-14.49 - 10.60)
Medical practice experience (years)	1.22**	0.89**
	(0.74 - 1.71)	(0.30 - 1.48)
Square of medical practice experience	-0.02**	-0.02**
	(-0.03 - -0.02)	(-0.03 - -0.01)
Self-employed (=1)	3.42*	2.89
	(0.18 - 6.66)	(-0.66 - 6.44)
Does hospital work (=1)	-3.58	-1.72
	(-7.37 - 0.20)	(-6.17 - 2.73)
Does after hours and on call (=1)	1.97	2.37
	(-0.85 - 4.79)	(-1.01 - 5.75)
Practice is stressful most of the time (=1 if agree)	-0.6	-1.67
	(-3.65 - 2.44)	(-4.95 - 1.61)
IT systems helpful (=1 if agree)	1.7	1.47
	(-1.28 - 4.69)	(-1.88 - 4.82)
Patients have complex health and social problems (=1 if agree)	-0.8	0.89
	(-3.74 - 2.14)	(-2.45 - 4.23)
Percent of patients who are Bulk-billed	0.17**	0.19**
	(0.13 - 0.22)	(0.13 - 0.25)
Victoria	1.16	-6.62
	(-2.61 - 4.93)	(-44.05 - 30.81)
Queensland	6.75**	22.71
	(2.67 - 10.84)	(-9.76 - 55.17)
South Australia	0.76	21.42
	(-4.03 - 5.56)	(-44.34 - 87.18)
Western Australia	8.66**	-45.38

	(2.80 - 14.52)	(-102.56 - 11.79)
Tasmania	-5.54	-24.68
	(-12.97 - 1.88)	(-119.82 - 70.45)
ACT	4.15	-10.03
	(-7.10 - 15.40)	(-68.26 - 48.20)
Northern Territory	1.87	-21.51
	(-15.11 - 18.86)	(-81.91 - 38.89)
ASGC: Inner regional (Excl: Maj City)	-4.55*	-1.38
	(-8.87 - -0.22)	(-12.65 - 9.89)
ASGC: Others	-9.11**	17.07
	(-14.58 - -3.65)	(-0.76 - 34.90)
SEIFA: Std Ind Disadv	-6.01**	-6.95*
	(-8.59 - -3.44)	(-12.56 - -1.34)
Constant	112.72**	120.96**
	(83.60 - 141.83)	(58.38 - 183.54)
R-squared	0.64	0.62
Observations	2798	2798
F-test	118**	156**

Robust standard errors in parentheses. * significant at 5%; ** significant at 1%