

Uptake of public sector sessional contracts by private general practitioners in South Africa

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List of abbreviations

CPD	Continuous Professional Development
DCE	Discrete Choice Experiment
DoH	Department of Health
GP	General Practitioner
LSM	Latent Class Model
MNL	Multinominal Logit
NHI	National Health Insurance
РНС	Primary Health Care
PSM	Public Sector Motivation
RWOPS	Remunerative work outside the public sector

Summary

This paper explores the pro-social preferences of private sector general practitioners (GPs) in South Africa in relation to a recent policy initiative aimed at persuading them to work for a number of hours each month in public sector clinics. We report on a pilot study which used a discrete choice experiment (DCE) with a national sample of GPs to evaluate their interest in these sessional contracts, and the relative importance of different contract elements. We found that the overall uptake of public sector work among private GPs was likely to be low under the contract conditions being offered by government. The DCE results suggested that GPs were more motivated by their own personal welfare than the potential benefit to public sector patients. However, we also demonstrated significant heterogeneity in the pro-social preferences of private GPs, and identified a small but significant group with more pro-social tendencies who were relatively enthusiastic about contributing to the public sector.

Keywords: General practitioner, South Africa, sessional contracts, discrete choice experiment

JEL classification codes: C25 ; D64; I10 ; J24 ; J44

1.Introduction

Economic theory is catching up with our everyday experience that not everyone is motivated purely by self-interest. Numerous experimental economic studies over the last two decades have shown that a significant proportion of people exhibit *pro-social behaviour* in that they not only care about the material resources they receive themselves but are also concerned about the material resources allocated to others (Fehr and Schmidt, 1999; Fehr and Fischbacher, 2002). A number of new economic theories have been proposed to explain such observed pro-social behaviour (Bénabou and Tirole, 2006; Meier, 2006).

One area of interest is the inter-relationship between institutional environment and pro-social behaviour (Frey and Bohnet, 1995). Certain institutional environments seem to promote pro-social behaviour but individuals with stronger pro-social preferences may also select institutional environments that match their preferences. Such arguments have been used to characterise the differences between public and private institutional environments, with the expectation that public sector workers would demonstrate higher levels of altruism (Francois, 2000; Delfgaauw and Dur, 2008).

Health professionals in general, and medical doctors in particular, are also expected to demonstrate significant pro-social behaviour - to be motivated more by patient benefit and medical ethics than by profit maximisation (Arrow, 1963; McGuire, 2000). Combining these perspectives would suggest that public sector doctors are especially altruistic (Kolstad and Lindkvist, 2012), although the implications for the behaviour of private sector doctors are less clear.

The literature on pro-social behaviour is premised on the insight that some people may choose to behave altruistically, at least some of the time (Fehr and Schmidt, 1999; Fehr and Fischbacher, 2002). Indeed, the heterogeneity of pro-social preferences has been confirmed in numerous experimental studies (Fischbacher et al., 2001; Andreoni and Miller, 2002). Similarly, there may be significant heterogeneity in pro-social behaviour even within groups that are expected to be more pro-social in orientation, such as public sector workers or medical doctors (Godager and Wiesen, 2013).

In this paper we explore these issues in relation to a recent policy initiative in South Africa. In order to increase access to doctors in public primary care the government has appealed to private general practitioners (GPs) to dedicate some time each month to working in public sector clinics. The GPs who agree to contract with the National Department of Health will be reimbursed through fixed sessional payments for their time. However, the public sector rates are significantly lower than what GPs could earn in their private practices, so the uptake of these contracts by private GPs will depend on the extent of their altruism in benefiting public sector patients.

We report on a pilot study which used a discrete choice experiment (DCE) with a random national sample of private GPs to quantify the relative importance of different contract elements on the uptake of sessional contracts. We found low rates of uptake among private GPs for sessional work in public clinics under the contract conditions being proposed by government. The results indicated that GPs were mainly motivated by financial incentives and their own personal welfare rather than non-financial incentives or potential benefit to public sector patients. Significantly higher rates of remuneration will be required to get more GPs to accept sessional work in the public sector. However, we also confirmed that private GPs are not a homogenous group. Some GPs will never agree to work in the public sector while others could be persuaded if higher payments were offered. However, there is also a small but significant group with more pro-social preferences who are relatively enthusiastic about contributing to public sector work.

The rest of this paper is organised as follows: Section 2 presents theoretical and empirical economic literature related to this research while Section 3 describes the relevant South African context, the study methodology is outlined in Section 4 and the results are reported in Section 5, with Section 6 providing a brief discussion of the results and their implications.

2. Related Literature

Theories explaining pro-social behaviour

Meier (2006) has reviewed recent economic theory development in relation to explaining pro-social behaviour. He characterises three different groups of theoretical explanations: (1) *utility theories* that propose that the utility of others can influence an individual's utility directly (pure altruism)(Becker, 1974), or indirectly because helping others produces a "warm glow" (impure altruism)(Andreoni, 1990), or through minimising inequalities in utility (inequality aversion)(Fehr and Schmidt, 1999); (2) *self-identity theories* that suggest that pro-social behaviour is the result of individuals' need to maintain their image of themselves as good people (Akerlof and Kranton, 2000); and (3) *reciprocity theories* that claim that individuals behave more generously towards others that have demonstrated a similar altruistic predisposition or intentions (Falk and Fischbacher, 2006).

Bénabou and Tirole (2006) present a slightly different formulation. Their model proposes that an individual's pro-social behaviour reflects the result of three underlying motivations: (1) *extrinsic motivation* which depends on the financial or material rewards they would obtain; (2) *intrinsic motivation* which refers to the value obtained from the pro-social behaviour itself; and (3) *reputational motivation* which is concerned with maintaining their self-respect or social reputation.

Pro-social preferences and the public sector

Numerous studies in the public administration literature have confirmed that public sector employees have stronger pro-social preferences than their counterparts in the private sector (Perry and Wise, 1990). This Public Sector Motivation (PSM) has been defined by Rainey and Steinbauer as a "general altruistic motivation to serve the interests of a community of people, a state, a nation or humankind" (1999, p23). The PSM literature has largely been concerned with investigating how individuals with higher PSM are: (1) more attracted to public sector employment; (2) perform better within public organisations; and (3) are less dependent on financial incentives to improve their performance (Perry et al., 2010).

More recently these questions have attracted some attention in the economic literature. Francois (2000) developed a theoretical model which showed that public organisations could obtain more effort from PSM individuals than private organisations under certain conditions, and that, given PSM, low-powered incentives could be efficient in the public sector. An influential paper by Besley and Ghatak (2005) focused instead on the different 'mission preferences' of workers - what different employees might consider a good organisation because of what it does, how it does it, or other employer characteristics. Their theoretical model demonstrated that matching employees and employers with similar missions enhances productivity, reduces the need for high-powered incentives, and improves organisational efficiency. A series of papers by Delfgaauw and Dur (2007; 2008) also modelled the self-selection of high PSM individuals into the public sector and the design of optimal remuneration schemes to attract such individuals to the public sector given that an applicant's level of prosocial motivation is private information.

A few empirical investigations of PSM have also been conducted by economists. For example, Gregg et al. (2011) showed that individuals working in the non-profit sector demonstrated more pro-social behaviour than those from the for-profit sector, using data from the British Household Panel Survey (BHPS) and unpaid overtime as a measure of pro-social behaviour. Georgellis et al. (2010) also analysed data from the BHPS focusing on individuals who changed jobs from the private to the public sector in the period from 1991-2004. They concluded that such individuals were attracted to the public sector by the intrinsic rather than the extrinsic rewards. Lastly, Dur and Zoutenbier (2014) using data from the World Values Survey of more than 30,000 employees from 50 countries found that both altruism and mission alignment were associated with selection into the public sector, particularly among more educated workers and those from lower-income countries.

Pro-social preferences of health professionals

The notion that medical doctors are not classical selfish agents has long been accepted by economists. In trying to understand fee price discrimination in the medical market Kessel (1958) suggested that medical care was different to other economic transactions because doctors could not

refuse patients that were unable to pay, and they therefore charitably financed the costs of medical care for the indigent. Arrow (1963) also drew attention to the ethical and normative constraints in health care markets which require doctors to be concerned about the welfare of their patients above maximising profits. In these early formulations (see for example Woodward and Warren-Boulton (1984)), professional ethics were generally considered as a constraint in the production functions of doctors.

However, such formulations were considered unnecessarily restrictive. Most subsequent theoretical economic models of medical behaviour have accepted the contention that doctors are different to other classical economic agents in having strong pro-social preferences, but have represented those preferences by including patient utility directly into the objective functions of medical providers. Expressed slightly differently, these models also characterise the agency problem in doctor-patient relationships, where the agency of doctors is determined by the relative weights they ascribe to the health benefits of patients and their own personal profit (McGuire, 2000).

An early example of this tradition is the frequently cited paper by Ellis and McGuire (1986) on hospital reimbursement mechanisms, which proposed that the utility functions of the hospital doctors deciding on the level of services to be provided included both the hospital's profit and the benefits to patients. Another early theoretical model is that of Farley (1986) on the functioning of the market for the supply and pricing of doctor services, who stated that doctors have both financial and humanitarian objectives which can best be formalised by assuming that the utility of patients is an argument in the utility functions of doctors. In their modelling of optimal provider payment systems, Ellis and McGuire (1990) argued that because doctors only observe and feel responsible for patient's health and not their overall welfare, the pro-social term in doctors' utility functions should relate to patients' health benefits rather than utility. Similar altruistic assumptions have been used in theoretical models to evaluate contracting for health services (Chalkley and Malcomson, 1998; Choné and Ma, 2011); doctor payment mechanisms (Eggleston, 2005; Jack, 2005; Makris and Siciliani, 2013); health insurance models (Ma and McGuire, 1997); doctor-induced demand (De Jaegher and Jegers, 2000); moral hazard and managed care (Ma and Riordan, 2002; Dranove and Spier, 2003); gatekeeping by doctors (Dusheiko et al., 2006); the sorting of doctors into the public and private sectors (Delfgaauw, 2007); pay for performance schemes (Siciliani, 2009; Kaarboe and Siciliani, 2011); doctors' therapeutic choices (Liu and Ma, 2013); and doctors' referral decisions (Allard et al., 2011); amongst others.

The majority of these specifications have required that the level of a doctor's altruism is given and known. However, a few more recent models have relaxed the fixed-altruism assumption. For example, Jack (2005) first considered how best to pay for health care services if doctors' levels of altruism were both heterogeneous and private information. Similarly, Choné and Ma (2011) model the impact of variable doctor agency on payment design where the purchaser is unable to determine a doctor's weighting of patient health benefit relative to personal profit, and Liu and Ma (2013) evaluate the delegation of therapeutic decisions to doctors with variable but unknown pro-social preferences.

Unfortunately, empirical evidence confirming the existence and heterogeneity of doctor altruism is very tenuous, in part because pro-social preferences are difficult to measure (Godager and Wiesen,

2013). Coulter et al. (2007) compared the altruism of medicine, law and business students at a California University, by means of a self-reported altruism index. Medical students had higher altruism scores than legal and business students in a multiple regression analysis adjusting for sociodemographic differences between the groups, though only the increase over legal students was statistically significant. Hennig-Schmidt and Wiesen (2014) compared the pro-social preferences of medical and non-medical students' in a controlled incentivised laboratory experiment, and found that the medical students were significantly more willing to sacrifice personal profit in order to increase the health benefits for patients. Godager and Wiesen (2013) further analysed the medical student data from this experiment and confirmed that there was substantial heterogeneity in the degree of altruism within the medical student group.

More closely related to our research questions, two recent studies have investigated the association between altruism and the job sector preferences of student health professionals. Kolstad and Lindkvist (2012) found that Tanzanian medical and nursing students who expressed a preference for working in the public sector had stronger pro-social preferences than those opting for the private sector, as measured by a dictator game and survey questions. A cohort study with medical and nursing students in Ethiopia by Serra et al. (2010) determined that higher pro-social preferences at baseline, using both a trust game and survey measure of altruism, predicted employment in the non-profit sector three years later.

Dual practice of health professionals

In the health literature, 'dual practice' refers to any situation where a health professional has more than one job (Ferrinho et al., 2004; Kiwanuka et al., 2011). Because we are interested in private GPs agreeing to undertake sessional work in the public sector, the literature on dual job-holding may be more appropriate than that on permanent career choices. Dual practice has attracted some attention by economists with a few theoretical models developed to cover aspects such as reimbursement (Rickman and McGuire, 1999; Ma, 2004); costs and benefits (Bir and Eggleston, 2003); regulation (Gonzalez, 2004; Gonzalez and Macho-Stadler, 2013); cream-skimming (Barros and Olivella, 2005); and moonlighting (Biglaiser and Albert Ma, 2007).

However, despite the inclusive definition, the entire literature on the dual practice of doctors is concerned with the motivations, possible advantages, negative consequences and regulatory responses for public sector doctors working part-time in the private sector (Ferrinho et al., 2004; Eggleston and Bir, 2006; Kiwanuka et al., 2011; Socha and Bech, 2011). We have been unable to find any dual practice literature concerned with the reverse phenomenon of private doctors working part-time in the public sector.

3. South African Context

South Africa is a country grappling with post-conflict transformation aimed at redressing the legacy of its history as well as new challenges such as HIV/AIDS. The Apartheid system of racial discrimination produced significant inequalities in all areas of human development including health (Coovadia et al., 2009). Since 1994 the new government has been trying to build a multiracial democracy founded on human rights and to increase access to basic social services (education, health and social support) for all South Africans (Schneider et al., 2007).

Modern-day South Africa is an upper middle-income country but still has relatively poor health system outcomes for its level of development, and persistent health inequalities (Mayosi et al., 2012). The health system also remains unequal. The private sector is well developed, employing the majority of medical doctors (Wadee and Kahn, 2007), with only 38% of primary care physicians retained to work in the public sector (Department of Health, 2011a). This problem is particularly acute in rural areas (George et al., 2009). The rich are able to afford private health insurance and access primary care services in the private health sector from GPs and specialists working in their own private practices and remunerated by fee-for-service (Ataguba and McIntyre, 2012). The poorer majority of the population rely on the tax-funded public health care system, which delivers primary care in primary care clinics staffed mostly by nurses but with some doctors (generally called Medical Officers in this context). Medical officers are paid a fixed salary but, like other public sector doctors, have been allowed to undertake a limited amount of work in the private sector under specific conditions, a policy known as RWOPS (Remunerative work outside the public sector).

A new charismatic Minister of Health was appointed in mid-2009 which has resulted in a number of new policy initiatives and a recommitment to improving national health outcomes (Motsoaledi, 2009; Department of Health, 2010). In order to address the unequal dual health care system, the government has now developed policy proposals for the expansion of universal coverage through the introduction of a national health insurance (NHI) system (Department of Health, 2011b). The NHI proposals include the establishment of a single NHI fund to improve equity and social solidarity, reengineering the primary health care (PHC) system, and improving the quality of public health services. In the reformed system, PHC services will be delivered through public clinics supported by municipal ward-based community health workers, school-based services, district-based clinical specialist support teams, and contracted private providers. These initiatives are currently being the developed and tested in 11 NHI district pilot sites around the country (Matsotso and Fryatt, 2013).

As part of PHC reengineering, the Department of Health (DoH) has proposed contracting with private GPs in order to increase access to doctors in public PHC services in under-served areas (Department of Health, 2011b). GPs have been asked to dedicate some time each month working in their local public sector clinics, for which they will be paid a fixed hourly rate (sessional payments). The initiative has been actively promoted by the Minister of Health, himself a GP prior to his appointment to government in 1994. The Minister personally undertook a national roadshow to each of the NHI pilot districts in an effort to recruit private GPs to the scheme (Bateman, 2012). The basic sessional rate being offered is the maximum public sector rate for doctors but the DoH has been investigating how to supplement this with additional allowances to make the offer more attractive to GPs (Wild, 2012). However, the sessional payments are still lower than what GPs could earn in their private practices,

so the uptake of these contracts will depend on how responsive GPs are to the appeals to their altruism in benefiting public sector patients.

There is some previous experience with contracting of private GPs in South Africa. Mostly in the Apartheid era, the government contracted private providers to deliver certain health care services on its behalf in under-served areas. For example, private GPs were contracted as part-time district surgeons to provide clinical and medico-legal services in certain areas without public sector facilities. Anecdotal reports of poor quality of medical and patient care by district surgeons were numerous and some research showed evidence of overcrowding, poor technical quality of services, and rudeness to patients (Palmer and Mills, 2003; Mills et al., 2004). The new government abandoned the district surgeon scheme soon after 1994. The irony is not lost on the Minister who has argued that the current proposals are for a new, much improved model (Bateman, 2011).

As proposals to contract private GPs for sessional work in the public sector are finalised, it is important to understand how the design of such contracts could be improved to increase uptake, efficiency and impact. It also provides an opportunity to explore the level and heterogeneity of the pro-social preferences of private GPs as they trade personal income against potential benefit to public sector patients in making these decisions.

4. Methodology

A stated preference discrete choice experiment (DCE) is a quantitative methodology for evaluating the relative importance of different product attributes on consumer choice behaviour (Louviere et al., 2000). DCEs have been used extensively to investigate consumer choices in marketing research and transport economics. In health economics DCEs have mainly been used to assess patient preferences for different models of health care delivery (Ryan, 2004; Ryan et al., 2008) or clinical therapy (Bridges et al., 2008; Marshall et al., 2010). More recently DCEs have been used with health care providers, primarily to quantify the relative importance of different factors on health workers' job choices (Lagarde and Blaauw, 2009; Ryan et al., 2012; Mandeville et al., 2014). None of these DCE designs have included a specific trade-off between income and patient benefit but all have compared the importance of financial and non-financial incentives in the career decisions of health professionals.

We developed a DCE to evaluate the relative importance of different contract elements - including income, non-financial incentives and potential patient benefit - on the uptake of sessional contracts by private GPs in South Africa. We attempted to follow current best practice in DCE design and analysis (Louviere and Lancsar, 2009; Bridges et al., 2011).

4.1. DCE design

DCEs begin by defining a hypothetical scenario for the choice experiment. We asked respondents to choose between two alternative sessional contracts being offered for work in a public sector clinic. Details were provided to the GPs on their roles and the likely nature of their work in these clinics

based on current government plans, and they were told that all contract facilities had passed a basic preparedness assessment ensuring that all necessary staff, equipment, drugs and space were available, as had been promised by the DoH in promoting the scheme (Bateman, 2012).

An important decision in DCE design is whether to use a labelled or unlabelled experiment (Hensher et al., 2005). We used an unlabelled design for the DCE because we are more interested in the tradeoffs between generic attributes than between named alternatives. We included an opt-out alternative allowing the respondent to choose neither of the sessional contracts on offer, indicating that they would not accept sessional work in the public sector under the terms on offer. Forced choice designs produce results conditional on the acceptance of the alternatives being offered, which may be unrealistic and produce significantly inflated estimates of utility and market shares (Dhar and Simonson, 2003; Caussade et al., 2005; Brazell et al., 2006). Including an opt-out was essential in our design given that GPs may legitimately refuse to take up work in the public sector, and that we were specifically interested in the extent to which they would do so.

The selection of attributes and definition of levels to include in the experiment is a critical step in DCE design (Lancsar and Louviere, 2008). We based our decisions about the contract elements to include on:

- Interviews with key informants and stakeholders involved in the design of the sessional contracts;
- Consultations with GP organisations and representatives;
- A pilot survey conducted by the DoH with GPs interested in applying for sessional work; and
- Literature review.

The outline of the final DCE design for our study is shown in Table 1. We included four different financial incentives. Firstly, the basic contract rate, which started at the current rate being proposed by the DoH (R265 per hour, 1USD≈12ZAR) followed by increments of 15%, 30% and 45%. Then we included two additional incentives offering a 15% increase but framed in two different ways - as a deprivation allowance, and as a performance bonus for meeting specified process quality targets. Lastly, we included an allowance for the reimbursement of transport costs which many GPs in the DoH survey mentioned as important (Table 1).

To maintain their registration with the Health Professions Council of South Africa, all GPs are required to obtain 30 Continuous Professional Development (CPD) points each year. We offered 15 CPD points as a non-financial incentive for those who agreed to participate in the initiative, as this was being considered by the DoH. We indicated the potential patient benefit from having a sessional GP by indicating the patient's proximity to the nearest public sector doctor at present. We also included the type and location of the PHC clinic, and its distance to the GPs private practice as other contextual attributes (Table 1).

Table 1: DCE attributes and levels

ATTRIBUTE	LEVELS
Type and location	Fully-functional container clinic in an informal settlement. Fixed clinic in the township.
Basic contract rate	R265.00 per hour. R350.00 per hour. R435.00 per hour. R520.00 per hour.
Distance from your current	10km away. Not travel reimbursement.
practice and travel reimbursement	30km away. Not travel reimbursement. 30km away. Travel reimbursement of R100 per trip. 30km away. Travel reimbursement of R130 per trip.
Deprivation allowance	None An additional R85.00 per hour.
Performance bonus	None. An additional R85.00 per hour if you meet specified quality targets relating to your consultation records, referrals, and adherence to DoH treatment protocols.
Distance to nearest public sector doctor	At the moment patients have to travel 20km to see a doctor (at the nearest public hospital). At the moment patients have to travel 40km to see a doctor (at the nearest public hospital).
CPD points offered for completing of induction and training activities	None. 15 CPD points.

The combination of attributes into alternatives and choice sets to be presented to respondents is based on experimental design principles (Cochran and Cox, 1957). However, the best statistical strategy for creating choice sets in a DCE is a matter of some controversy. Optimal orthogonal designs have come to dominate approaches in health economics (Street and Burgess, 2007; Street et al., 2008), whereas practitioners in transport economics argue for efficient designs tailored for the expected coefficients (priors) and statistical model (Rose and Bliemer, 2009). We followed the latter approach and used the Ngene software program (Choicemetrics, 2011) to develop an incremental Bayesian D-efficient DCE design. We started with a standard orthogonal design for the first 25 respondents, and then used their responses to produce the priors required for generating the final Defficient design. The Bayesian approach allowed for some uncertainty around the assumed coefficients (Rose and Bliemer, 2009). The final design had 16 choice sets per respondent which may be fairly taxing but has been used in many other studies (Caussade et al., 2005; Mandeville et al., 2014). An example of the final DCE choice task is shown in Figure 1.

Figure 1: Example of DCE choice task

Q1. Which of these two contracts would you choose?						
CONTRACT A	CONTRACT B					
Location: Fully-functional container clinic in an informal settlement.	Location: Fully-functional container clinic in an informal settlement.					
Basic contract rate: R435.00 per hour.	Basic contract rate: R350.00 per hour.					
Distance from your practice: 30km.	Distance from your practice: 10km.					
Transport allowance: R130 per trip.	Transport allowance: None.					
Deprivation allowance: An additional R85.00 per hour.	Deprivation allowance: An additional R85.00 per hour.	l would not choose either of these two contracts. I would				
Performance bonus: An additional R85.00 per hour if you meet specified quality targets relating to your consultation records, referrals, and adherence to DOH treatment protocols.	Performance bonus: An additional R85.00 per hour if you meet specified quality targets relating to your consultation records, referrals, and adherence to DOH treatment protocols.	not do sessional work in the public sector if these were the contracts offered.				
Distance to nearest public sector doctor:	Distance to nearest public sector doctor:					
At the moment, patients in this clinic have to travel 20km to see a doctor (at the nearest public hospital).	At the moment, patients in this clinic have to travel 20km to see a doctor (at the nearest public hospital).					
CPD points for induction and training: None.	CPD points for induction and training: 15 points.					
CONTRACT A	CONTRACT B	NEITHER				
0	0	0				

We also developed a separate questionnaire to capture relevant personal and practice characteristics for each respondent as well as their attitudes to sessional work in the public sector.

4.2. Sampling and data collection

The DCE was administered to a random sample of private sector GPs in South Africa in the form of an online self-administered questionnaire (Survey Console). The questionnaire was completed in English. The sampling frame was obtained from the Board of Healthcare Funders (Board of Healthcare Funders, 2012) and consisted of all private general practitioners registered with them with a current email address (approximately 80% of all registered GPs).

Sample size considerations in DCE analysis have generally been based on empirical experience rather than mathematical calculation (Louviere et al., 2000). The usual requirements for basic analysis are in the range of 50-100 respondents (Scott, 2001). We anticipated that the online survey response rate would be in the order of 10-20% (Deutskens et al., 2004). Therefore, for this pilot study an initial random sample of 500 GPs was recruited by email to participate in the study. GPs who completed the online survey were entered into a lottery draw for an iPad as an incentive to increase participation (Sheehan, 2001). Email reminders, managed through Survey Console, were also used to try and increase the response rate to ensure an adequate number of complete questionnaires available for analysis.

4.3. DCE analysis

Data from the DCE was entered, cleaned and analysed using Stata and the LIMDEP/Nlogit software programs. DCE analysis uses regression techniques to model respondents' choices as a function of the attributes in the design. Standard DCE analysis has frequently been based on McFadden's (1974) multinomial logit (MNL) model despite the known limitations of this model (Hensher et al., 2005).

More recent analytical models use computer simulation methods to develop more complex and more realistic choice models (Train, 2003).

We used the regression coefficients from the MNL model to evaluate the relative importance of each contract element in the respondents' choices. The alternative-specific constant for the opt-out alternative indicates the likelihood of uptake of the sessional contracts. To aid in the interpretation of the coefficients we also used the regression results to model the probability of contract uptake given different combinations of the contract elements (Lancsar et al., 2007).

We investigated the heterogeneity of GP preferences in three ways: (1) by including interaction terms between demographic variables and the opt-out constant in the MNL model to investigate the impact of different provider and practice characteristics on contract uptake (Hensher et al., 2005); (2) by using a mixed logit model (also called the random parameter logit model) to formally test for significant heterogeneity around the coefficient means (Hensher and Greene, 2003); and (3) with latent class models to identify subgroups of GPs with similar preferences (Greene and Hensher, 2003).

4.4. Ethical considerations

National and international ethical standards were followed throughout. Ethical approval for the study was obtained from the Human Research Ethics Committee (Medical) of the University of the Witwatersrand in South Africa, and from the research ethics committee of the London School of Hygiene & Tropical Medicine in the United Kingdom. Participation was entirely voluntary and informed consent was obtained. GPs who completed the online DCE were entered into a lottery for a prize to increase the response rate but we did not think that this constituted undue inducement for busy doctors. Survey Console allowed the tracking of which individuals had completed the survey but their names were not captured in the final dataset so all the data analysis is anonymous.

5. Results

5.1. Socio-demographic characteristics

500 GPs were emailed to participate in the survey, 493 had valid addresses, and 74 completed the entire questionnaire, giving a response rate of only 15.0%. Relevant socio-demographic characteristics of the respondents are summarised in Table 2.

% / Mean ± sd
64.4%
48.8 ± 10.4
18.5 ± 10.5 year
R 297.7 ± 49.78
R 254.71 ± 62.23
61 ± 22.5%
R 1119.95 ± 600.39
22.5%
50.0%

Table 2: Participant socio-demographic characteristics

Nearly two-thirds of respondents were male, their average age was just under 49, and they had been working as GPs for 18.5 years on average. 22.5% were already doing sessional work in the public sector and 50.0% said they would consider doing work in public sector clinics.

Interestingly, the respondents indicated an average of over 60% of insured patients in their practices. The GPs charged an average of R298 per consultation for insured patients and the slightly lower R255 for cash patients. They estimated that their average gross income per hour was over R1100 which is significantly higher than the sessional rate being offered by the DoH.

5.2. Relative importance of contract elements

The basic MNL analysis of the DCE results are shown in Model 1 in Table 3. The high coefficient of the opt-out constant in the regression results indicates that GPs frequently did not choose either of the sessional contracts offered (Table 3). A coefficient of 3.08 in would mean that GPs were approximately 20 times more likely on average to opt-out than to choose a sessional contract.

	MNL [Coef (SE	E)]
	Model 1	Model 2
	Attributes	+ Interactions
Contract characteristics		
Fixed clinic	0.429***	0.333***
	(0.096)	(0.114)
Nearest public sector doctor 20km further away	0.000	-0.051
	(0.093)	(0.109)
10 CPD points for induction and training	0.061	0.017
	(0.089)	(0.105)
Facility 20km nearer to current practice	1.024***	1.128***
	(0.156)	(0.190)

Table 3: MNL DCE results

Increase in basic contract rate of R85 per hour	0.569*** (0.175)	0.723*** (0.213)
Increase in basic contract rate of R170 per hour	1.447*** (0.174)	1.721*** (0.211)
Increase in basic contract rate of R255 per hour	2.013*** (0.171)	2.315*** (0.210)
Additional deprivation allowance of R85 per hour	0.571*** (0.110)	0.630*** (0.131)
Additional Performance bonus of R85 per hour	0.486*** (0.095)	0.565*** (0.113)
Additional transport allowance of R100 per trip	0.580*** (0.153)	0.689*** (0.181)
Additional transport allowance of R130 per trip	0.686*** (0.171)	0.870*** (0.204)
<u>Opt-out constant</u>	3.083*** (0.237)	3.784*** (0.315)
Demographic characteristics		Interaction with
Under 50 years old		-0.252 (0.162)
Upper tertile of turnover per hour		0.980*** (0.181)
Currently doing sessional work		-0.584*** (0.196)
Likely to accept sessional work in public clinic		-1.089*** (0.156)
Observations	1184	1184
Pseudo R-squared	0.123	0.212
Log likelihood	-1 125.1	-789.3
p Value	<0.001	<0.001

*** p<0.01, ** p<0.05, * p<0.10

When GPs did choose a sessional contract, all of the financial aspects of the contract strongly influenced their choices, they preferred fixed clinics to container clinics, and distance to their current practice was a significant consideration. However, the non-financial attribute (CPD points), and the ability of patients to benefit from their acceptance of the post, did not appear at all important to GPs.

Not surprisingly, the highest rate of basic remuneration produced the largest increase in contract utility. Utility increased by 2.013 units when the sessional rate was increased from R265 to R520 per hour indicating that GPs were 7.5 times more likely to choose the contract when offered the higher rate. The coefficients for an increase in R85 per hour framed as a basic rate, a deprivation allowance and a performance bonus were similar (Table 3). We had expected lower utility from a performance bonus because it depended on compliance with specified quality targets such as adherence to DoH treatment protocols, referral rates and consultation monitoring. The coefficient for the performance bonus was slightly lower (at 0.486) than that for a basic contract rate (at 0.569), but the difference was not statistically significant (p=0.678, Wald test). This suggests that GPs might be prepared to accept more oversight of their practice in exchange for higher sessional rates.

Calculating the marginal rates of substitution for type of PHC clinic and distance away (using a 15% increase in the basic contract rate as the comparator) indicates that GPs would be prepared to forgo R64.09 per hour to work in a fixed clinic rather than a container clinic, and R152.97 per hour if the sessional clinic was 20km nearer to their current practice.

5.3. Modelling of predicted contract uptake

To represent the DCE results in a more intuitive way, we used the MNL results to model the predicted uptake of a sessional contract given different changes in contract design (Table 4). With the current contract being considered by the DoH only 7.5% of GPs in our survey would be predicted to accept it. Interestingly, this figure goes up to 16.9% if the sessional work is within 10km of the GPs current practice. Increases in the basic contract rate of 15%, 30% and 45% would increase the uptake of sessional contracts to 13.4%, 21.8% and 34.6% respectively, from the baseline of 7.5%.

 Table 4: Policy simulation of contract uptake for different sessional contracts (MNL)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Facility	Fixed Clinic	Container	Fixed Clinic											
Basic rate	R265	R265	R265	R265	R265	R350	R265	R265	R265	R435	R520	R350	R350	R520
Distance	30km	30km	30km	30km	10km	30km								
Transport allowance	0	0	0	0	0	0	0	0	R100	0	0	R100	R100	R130
Deprivation allowance	0	0	0	0	0	0	R85	0	0	0	0	R85	R85	R85
Performance related bonus	0	0	0	0	0	0	0	R85	0	0	0	R85	R85	R85
Nearest doctor	20km	20km	40km	20km	40km	40km								
CPD points	0	0	0	10	0	0	0	0	0	0	0	0	10	10
Total/ Hour	R265	R265	R265	R265	R265	R350	R350	R350	R365	R435	R520	R620	R620	R820
CONTRACT UPTAKE	7.5%	5.2%	7.9%	8.0%	16.9%	13.4%	13.3%	12.6%	12.9%	21.8%	34.6%	43.6%	46.6%	73.1%

GP representatives had proposed to the DoH steering committee for this intitiative that a deprivation allowance, a performance bonus and a transport allowance would be needed to be added to the basic contract rate (a total remuneration of R620 per hour) to induce GPs to accept sessional contracts. Under these conditions, the DCE model predicts that 43.6% of GPs would accept sessional work. Uptake of over 50% would require even higher total remuneration, closer to what GPs claimed to earn in their current practices.

5.4. Heterogeneity of GP preferences

MNL model interactions

We included socio-demographic interactions with the opt-out constant in the MNL model to evaluate GP personal characteristics associated with a propensity to accept or reject sessional work in the public sector. We identified a number of significant GP characteristics influencing the uptake of PHC contracts (Table 1 Model 2).

Those who indicated higher rates of remuneration in their current practice were more likely to optout but those already doing sessions and those that said they were likely to accept PHC contracts had significantly lower aversion to sessional contracts. GPs under 50 years of age also seemed less averse to sessional work but the difference was not statistically significant.

Mixed logit model analysis

We used mixed logit models to formally test for the presence of heterogeneity in the preferences of GPs.

Table 5 shows the results of a mixed logit model in which we assumed normal distributions for all parameters. The model fit of the mixed logit model is significantly better than the MNL model but the significant coefficients and the relative ranking of the attributes are comparable to that found with the MNL model.

The mixed logit analysis indicates statistically significant heterogeneity (significant standard deviations) for most coefficients including the opt-out constant, but excepting for CPD points, patient benefit and the higher transport allowance (Table 5).

	Mixed Logit [Coef (SE)]	
	Mean	sd
Contract characteristics		
Fixed clinic	1.794***	2.986***
	(0.435)	(0.416)
Nearest public sector doctor 20km further away	0.028	0.241
	(0.180)	(0.255)
10 CPD points for induction and training	0.412**	0.340
	(0.184)	(0.242)

Table 5: Mixed logit DCE results

Facility 20km nearer to current practice	2.399*** (0.680)	4.333*** (0.520)
Increase in basic contract rate of R85 per hour	1.955*** (0.436)	1.496*** (0.444)
Increase in basic contract rate of R170 per hour	4.579*** (0.496)	0.772*** (0.297)
Increase in basic contract rate of R255 per hour	5.869*** (0.543)	1.933*** (0.302)
Additional deprivation allowance of R85 per hour	1.446*** (0.247)	0.930*** (0.188)
Additional Performance bonus of R85 per hour	1.014*** (0.241)	1.441*** (0.272)
Additional transport allowance of R100 per trip	1.267*** (0.318)	0.793** (0.371)
Additional transport allowance of R130 per trip	1.964*** (0.349)	0.465 (0.416)
Opt-out constant	7.626*** (0.771)	6.630*** (0.708)
Observations	1184	
Pseudo R-squared	0.504	
Log likelihood	-644.7	
p Value	<0.001	

*** p<0.01, ** p<0.05, * p<0.10

Latent class model analysis

A more interesting analysis was revealed by use of the latent class model (**Table 6**). Comparing model fit with different numbers of latent classes indicated that three classes fit the data best (results not shown). Overall model fit for the final 3-class latent class model is also better than the MNL model (Table 6).

	LCM [Coef (SE)]		
	Class 1	Class 2	Class 3
Contract characteristics			
Fixed clinic	0.348	0.883***	0.251
	(0.642)	(0.148)	(0.173)
Nearest public sector doctor 20km further away	-1.372	-0.022	-0.038
	(0.895)	(0.134)	(0.156)
10 CPD points for induction and training	1.117	0.054	0.080
	(0.798)	(0.129)	(0.150)
Facility 20km nearer to current practice	4.514***	1.784***	1.586***
	(1.471)	(0.254)	(0.342)
Increase in basic contract rate per R85 per hour	2.648***	1.172***	0.876***
	(0.959)	(0.094)	(0.134)
Additional deprivation allowance of R85 per hour	2.829**	0.888***	0.846***
	(1.174)	(0.148)	(0.175)
Additional Performance bonus of R85 per hour	1.847*	0.823***	0.719***
	(0.963)	(0.148)	(0.180)
Additional transport allowance of R100 per trip	3.238**	1.149***	0.943***
	(1.423)	(0.239)	(0.293)
Additional transport allowance of R130 per trip	3.323**	1.521***	1.015***
	(1.441)	(0.253)	(0.331)
Opt-out constant	15.639***	4.841***	-0.644
	(4.315)	(0.431)	(0.631)
Class probabilities	0.296	0.462	0.242
Observations	1184		
Pseudo R-squared	0.394		
Log likelihood	-788.200		
p Value	<0.001		

Table 6: Latent class analysis of DCE results

*** p<0.01, ** p<0.05, * p<0.10

The latent class results indicate three different groups of GPs with quite different preferences that we would interpret as follows:

- Class 1 (29.6%) is made up of GPs who are extremely opposed to sessional contracts (high opt-out coefficient) and highly motivated by financial incentives (higher coefficients for these variables).
- Class 2 (46.2%) are the majority who are still opposed to sessional contracts (but significantly less than Class 1) and less motivated by financial incentives.
- Class 3 (24.2%) which is actually not opposed or indifferent to sessional contracts (nonsignificant opt-out constant) and least motivated by financial incentives.



Figure 2: Policy simulations from latent class model (LCM)

Again, the class differences are revealed more clearly in the model predictions of sessional contract uptake. These are represented graphically in Figure 2, which shows the increase in uptake for each contract element in order of importance, comparing the results of the three latent classes in the LCM model and the average for the entire group represented by the MNL model. Class 1 would not accept sessional contracts for work in the public sector whatever the remuneration or contract specifications, even at the highest rates offered in our DCE design. The results for Class 2 are similar to the average results discussed for the MNL model, except with slightly higher sensitivity to increases in remuneration. Class 3 is interesting. Although they only made up 24.2% of the GPs in our survey, they have much higher uptake under the baseline contract conditions at 44.3%. A mere 15% increase in the basic contract rate would increase uptake to nearly two-thirds for this class. Interestingly, none of the classes were significantly influenced by CPD points or the patient benefit attribute.

5.5. Other concerns raised by GPs

Lastly, the general questionnaire included an open-ended question which asked GPs to voice their concerns and recommendations for improving the design and uptake of the session contracts. The most common issues mentioned by the GPs were:

- That the sessional rates being offered were not high enough, and that they needed to be more market-related.
- The importance of distance and reimbursing GPs for travel costs.
- Fears about security at public sector clinics, and in the areas where the public sector clinics are located.
- Questions about the likelihood and timeliness of receiving payments from the DoH.
- Concerns about the availability of medicines and equipment at the clinics.
- The limited opportunities for personal development or use of their more specialised skills.
- Preferences for a contracting-out model where GPs would be reimbursed for seeing public sector patients in their existing rooms.
- The lack of consultation with GPs in the formulation and design of this policy initiative.

6. Discussion and Conclusions

The results of our pilot DCE study indicate relatively low rates of uptake among private GPs for sessional work in public PHC clinics under the contract conditions being considered by the DoH. The DCE suggests that private GPs are mainly motivated by financial incentives and their own personal welfare. The GPs in our survey were not influenced by non-financial incentives or the fact that public sector patients would benefit from their work in the PHC clinics. However, we also confirmed that private GPs are not a homogenous group. There is a segment of GPs that will never agree to undertake sessional work in the public sector, a larger proportion that could be persuaded if the payments being offered were

significantly higher, and an interesting sub-group of GPs who are more enthusiastic about sessional contracts in the public sector.

There is limited economic theory and empirical data directly relevant to our study. Because we included only private sector GPs we were not able to verify empirically that doctors have higher pro-social preferences than other professions. We also did not directly compare the altruism of public and private doctors although we did find that our sample of private sector GPs was primarily motivated by financial benefits. However, our findings are related to other recent studies that have indicated that higher prosocial preferences are associated with selection of health workers into the public sector (Serra et al., 2010; Kolstad and Lindkvist, 2012). We identified a sub-group of private GPs that was less motivated by the financial aspects of the contracts and that were also more enthusiastic about public sector work. Although even this group did not respond significantly to the patient benefit attribute in our DCE. We were also able to provide further empirical confirmation of the results of Godager and Wiesen (2013) that there is significant variation in the levels of altruism among medical professionals.

Health economists have unanimously accepted that doctors have significant pro-social preferences that distinguish them from classical economic actors, and included this assumption in most theoretical models of doctor decision-making (McGuire, 2000). However, the theoretical bases of such pro-social preferences remain poorly developed in this literature. In terms of Meier's (2006) typologies, most recent specifications seem to assume a form of pure altruism where the utility of doctors is directly influenced by the utility or health benefits of their patients. However, less attention has focused on the self-identity and reputational motivations of doctor, or that fact that impure altruism and reciprocity may also influence their behaviour. Others have criticised some of the fundamental assumptions in these models. For example, Batifoulier and Da Silva (2014) have argued that most economic formulations of doctor altruism are a form of instrumental altruism rather than real altruism, and Glannon and Ross (2002) propose that responsibility to patients is central to medical professionalism and not altruism at all. The balance of economic incentives, public service motivation, and professional norms in explaining the behaviour and performance of health professionals requires further theoretical development (Andersen, 2009).

Another important consideration is the complex interplay between external and internal motivation in determining pro-social behaviour. On the one hand, it would be assumed that the relative cost of engaging in pro-social behaviour would influence the likelihood of it occurring (Meier, 2006), so subsidising the cost of such actions would increase altruistic behaviour (Eckel and Grossman, 2003). However, on the other hand, there is also a considerable theoretical and empirical support for the argument that financial incentives might crowd-out pro-social behaviour (Frey and Jegen, 2001; Bénabou and Tirole, 2006; Georgellis et al., 2010). For the private GPs in our study, the fact that there is a significant focus on the rate of remuneration for the proposed public sector work may shift them from an ethical, altruistic mode of decision-making to a more calculating, exchange mode, in which the amounts being offered are clearly insufficient (Gneezy and Rustichini, 2000).

The objective of this research was to add to the limited empirical literature on the altruism of medical doctors. An important advantage of this study is that it was conducted with actual practising doctors rather than medical students, one of the few such studies in the literature. It also adds to the very small literature on the responses of private doctors to health system reform in South Africa (Moosa, 2014; Surender et al., 2015).

However, the study does have a number of limitations. For one thing, these are the results of a pilot study with only a small number of respondents, although we would argue that private GPs are a much more difficult group to study and the sample size is not that different from other related empirical studies in the literature (larger than that of Hennig-Schmidt and Wiesen (2014), and Kolstad and Lindkvist (2012), for example). Planning is underway on how to improve the study design and conduct a larger national survey.

More difficult is that we used unsolicited email invitations and an online survey method which always suffer from low response rates and unknown response bias (Deutskens et al., 2004). Our participation incentive may have favoured the inclusion of more externally motivated GPs, but GPs with higher internal motivation may have been more responsive to appeals to help us with our research. We also sought to frame the survey as neutrally as possible, so as to capture the attention of GPs who would want to express their interest in the government proposals as well as those who would want to indicate their opposition.

The limitations of DCEs are also clearly acknowledged (Lagarde and Blaauw, 2009). DCEs are mainly criticised for their potential hypothetical bias in relying on stated preferences which may not predict actual decisions - although it should be noted that the analysis of revealed preference data is far from straightforward (Hensher et al., 2005). DCEs can also only include a restricted set of attributes which may limit their range and realism. The fact that GPs did not respond to patient benefit or the non-financial incentives in the DCE may have had to do with our specification of those attributes rather than GP's lack of altruism. Also, as indicated by the concerns expressed in the survey open-ended questions, respondents' decisions may have been influenced by considerations other than the contract elements included in the DCE design, even when they were told, for example, that they were to assume that all necessary resources would be provided to them.

In terms of the policy implications of this study, it does suggest ways in which the design of the sessional contracts can be improved to increase uptake. Unfortunately, it does appear that significantly higher rates of remuneration will be required to get the majority of GPs to accept sessional work. We found that the framing of different financial incentives made little difference to the contract uptake although reimbursement of transport costs would seem important to specify directly. On the other hand, we found less opposition to performance monitoring than we had expected. Although the transaction costs of such systems would be higher than a simple increase in the basic rate, it would seem important to introduce performance monitoring early on so that the intended improvements in clinical care for public sector patients are actually realised, and to prevent potential abuse.

Our confirmation of significant heterogeneity in the pro-social motivations of private GPs is also important. Our results suggest that there a small but significant proportion of GPs, who are relatively enthusiastic about contributing to work in the public sector and should be targeted in this policy initiative. The Department of Health will never be able to persuade all private GPs in the country to volunteer their services to the public sector but it also unlikely that they need to do so. However, it is not clear whether the pool of more altruistic private doctors in the country is sufficient for current needs. What needs to be determined more precisely is how many GPs are required, and where they are needed, to be able to achieve the government's policy objectives. Other important issues requiring attention include more careful analysis of the relative cost-effectiveness of alternative policy options for addressing the public sector need for doctors in primary care, and a clear strategy for monitoring and evaluating the health service and health system impacts of this initiative when it is implemented.

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