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## **Job satisfaction and intentions to quit amongst general practitioners**

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### **Abstract**

Data from a survey of General Practitioners in Scotland and England are used to investigate the determinants of job satisfaction and the impact that job satisfaction has on intentions to quit. Intentions to leave direct patient care were modelled as a function of overall job satisfaction, domains of job satisfaction, and GPs' personal, job, and work environment characteristics. Job satisfaction was modelled as a function of its domains and GPs' characteristics, while each domain of job satisfaction was modelled as a function of GPs' characteristics. The equations of the model were estimated simultaneously. Intentions to quit were higher due to the impact of clinical governance on GPs' autonomy, as well as through the indirect effect of long hours of work on overall job satisfaction. The other domains of job satisfaction also played a role, including recognition for good work. Objective job characteristics and pecuniary factors had little effect, once domain satisfactions were accounted for.

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## 1 Introduction

The greater the well-being of the workforce, the lower is absenteeism and turnover, and the higher is productivity (Lichtenstein, 1984). In health care, the job satisfaction of health professionals may also influence the quality of care received by patients (Davis et al., 1995; Melville, 1980; Linn et al., 1985). It has been suggested that general practitioners (GPs) became less satisfied after a revised contract was imposed in 1990 (Sutherland and Cooper, 1992; Sibbald et al., 2000). The recruitment and retention of GPs has since become a major policy concern with fears that the stock of trained GPs may not be adequate to deliver planned changes in health services. The increasing numbers of GPs retiring, an ageing GP population, an increase in the proportion of female GPs (from 28.6% in 1990 to 39.2% in 2000 in Scotland) and an increase in part-time and flexible working (5% of GP principals worked part-time in 1990 rising to 16% in 2000 in Scotland), have contributed to these concerns (Elliott et al., 2002).

This paper investigates the determinants of job satisfaction and intentions to quit for GPs, developing the model proposed by Clark and Oswald (1996) and extended by van Praag et al. (2002). The model assumes that overall job satisfaction is an aggregate of satisfaction with a number of its domains, such as satisfaction with remuneration or with the amount of recognition received. In turn, intentions to quit depend on job satisfaction.

Several studies have used the job satisfaction domains as independent variables in explaining overall job satisfaction (Ward and Sloane, 2000; Shields and Ward, 2001; Clark, 2001). Others have used individual-specific 'work values' based on attitudinal questions about which factors of a job are 'important' (Clark, 1996 and 1997; Ward and Sloane, 2000; Shields and Ward, 2001). Clark (1997) estimated separate equations for domain satisfactions. However, other studies of the determinants of job satisfaction have not included these domains, and have included only personal and objective job characteristics as regressors (Clark and Oswald, 1996; Drakopolous and Theodossiou, 1997; Sloane and Williams, 1994). In effect, they estimate reduced form models of job satisfaction.

## 2 The model

Van Praag et al. (2002) formalize the use of domain satisfactions and include job satisfaction as one of a number of domains of overall life satisfaction, which include financial, house, health, leisure, and environment satisfaction. They estimate the domain satisfaction equations simultaneously.

This paper uses the concept of domain satisfactions as determining overall job satisfaction. The domains of job satisfaction are defined by questions asking about satisfaction with particular aspects of the job that are not captured by objective job characteristics (e.g. satisfaction with recognition you get for good work), but may nevertheless be important determinants of overall job satisfaction and motivation.

Satisfaction with domain  $i$  ( $D_i$ ) is assumed to be a function of workers' characteristics ( $S$ ) and job attributes ( $A$ ) that may differ in sign and magnitude across different domains. There may also be unobservable variables ( $z$ ), such as personality, health status and past experiences, that determine both  $D_i$  and overall job satisfaction ( $J$ ). Overall job satisfaction is determined by  $D_i$  as well as  $S$ ,  $A$  and  $z$ :

$$D_i = D_i(S, A, z), \quad i = 1, \dots, 9 \quad (1)$$

$$J = J(D_i, S, A, z) \quad (2)$$

Equation (2) nests the model suggested by van Praag et al., who did not include  $S$  or  $A$  in their overall satisfaction equation and so did not test for them having a direct effect on overall satisfaction, in addition to their indirect effect through  $D_i$ .

Both  $J$  and the  $D_i$  are assumed to influence intentions to quit, along with personal and job characteristics:

$$Q = (J, D_i, S, A, z) \quad (3)$$

The effect of job satisfaction on quitting behaviour has been shown by a number of studies, as has the effect of job satisfaction on intentions to quit (Mobley et al., 1978 and 1979; Akerlof et al., 1988; Laband and Lentz, 1998; Clark et al., 1999; Shields and Ward, 2001).

### 3 Data and methods

#### 3.1 Sample

Data for this study were taken from an anonymous postal questionnaire survey of English and Scottish GPs. The questionnaire enquired into job satisfaction, job stresses, intentions to quit, and demographic, job, and practice characteristics. A random sample of 2,000 GP principals and 600 salaried GPs drawn from the GMS-Stats database maintained by the English Department of Health was obtained. An additional sample of 400 GP locums was taken from the membership list of the National Association of Non-Principals. For Scotland, a random sample of 1,000 Scottish GP principals was drawn from the GP database maintained by the Information and Statistics Division of the Scottish Executive Health Department. A further sample of all 359 GP non-principals (excluding locums) and all 62 PMS GPs in Scotland was included.

#### 3.2 Response rate

The English survey was conducted in March 2001, whilst the Scottish survey was carried out in August 2001. Non-respondents were mailed up to two more times at intervals of three weeks. After two months, 1,924 English GPs and 857 Scottish GPs had returned usable questionnaires, generating an overall response rate of 63%. Both samples were representative in terms of a number of GP and practice characteristics.

### 3.3 Variables

The Warr-Cook-Wall scale was used to measure overall job satisfaction ( $J$ ) and satisfaction with nine aspects of work,  $D_i$  (Warr et al., 1979). Each item was rated on a seven-point Likert scale, where a value of one denotes extreme dissatisfaction and a value of seven reflects extreme satisfaction.

GPs were asked about anticipated changes in their work commitment. The likelihood that a GP would leave direct patient care within the next five years was measured on a five-point Likert scale, with increasing values reflecting a higher likelihood of quitting ( $Q$ ).

The individual characteristics of GPs ( $S$ ) included age, gender, ethnic background, marital status, and number of children aged under 18 years old. Job characteristics ( $A$ ) included household income, the number of hours worked per week as a GP, including surgeries, visits, and administration. Other job characteristics were contract type and tenure in current post.

Finally, the characteristics of the work environment were included. Practice characteristics related to the number of GPs in the practice (including assistants, retainers, and salaried GPs), list size, practice location, and level of deprivation of patient groups. The effect of recent structural reform in primary care was captured by questions asking about the effect of new integrated primary care organisations (PCOs: Primary Care Groups (PCGs) in England and Local Health Care Co-operatives (LHCCs) in Scotland) on workload, quality of care, and co-operation among general practices. The effect of clinical governance on workload was also included. Clinical governance is a system of ensuring high standards of care through increased accountability of doctors. These variables were measured on a five-point Likert scale, with increasing values representing an improvement.

### 3.4 Estimation

A main issue in the analysis is the existence of potential unobservables ( $z$ ) that are common to equations 1 to 3. The error terms of the domain satisfaction equations may be correlated with themselves and with the error term in the overall job satisfaction equation and intentions to quit equation. Equations 1-3 are recursive and were therefore estimated using the seemingly unrelated regressions model, allowing the error terms of the equations to be correlated (SUR) (Zellner, 1962). SUR uses Iterated Feasible Generalised Least Squares (FGLS) to produce efficient and consistent maximum likelihood estimates of the parameters (Greene, 2000). The presence of such correlations, and therefore the need to use the approach, can be tested for using a Breusch-Pagan test.

The SUR model assumes that the dependent variables are continuous variables with cardinal properties. However, job satisfaction and intentions to quit are ordered,

categorical variables. We suggest that if OLS and ordered probit results are similar for each equation estimated separately, then SUR can be applied to our model as if the dependent variables were continuous and cardinal. OLS and ordered probit models are therefore estimated separately, in addition to a SUR model. Psychologists, who implicitly assume cardinal interpersonal comparisons of utility, have used OLS extensively despite the ordered categorical nature of the satisfaction variables. Ordered probit has been used by economists who prefer to allow only ordinal comparisons of utility. In practice, several studies have shown the results of each of these methods to be similar (Ferrer-I-Carbonell and Frijters, 2002).

## 4 Results

Sample characteristics are shown in Table 1 for the 1,673 GPs included in the regression analysis (after excluding missing values). The results of the Breusch-Pagan test show moderate and statistically significant correlations amongst the error terms of all equations ( $\text{Chi}^2(55) = 6,153; p < 0.0001$ ). Comparison of the SUR estimates with that from individual OLS equations showed marked differences in coefficients and standard errors, and some differences in the statistical significance of coefficients (results not shown). This suggests that use of the SUR approach was appropriate. Each equation was also estimated individually using OLS and ordered probit (results available on request). There were no differences in terms of the variables that were statistically significant. The use of continuous dependent variables within the SUR models therefore seemed appropriate.

Table 2 shows the domain satisfaction equations. GPs' personal, job and work environment characteristics explained a relatively low proportion of the variation in the domain satisfaction equations (pseudo  $R^2$  between 4% and 25%).

Those factors that had an influence on the domains of job satisfaction varied, although there were some patterns. In terms of GPs' personal characteristics, male GPs were less satisfied with their remuneration than females. GPs aged between 55 and 59 years were more likely to be satisfied with freedom to choose own method of working compared to GPs aged under 34 years. GPs aged between 35 and 44 years were less likely to be satisfied with recognition for good work compared to GPs aged under 34 years, although GPs aged over 60 were more likely to be satisfied with this aspect of satisfaction. GPs aged between 35 and 49 years were less likely to be satisfied with the amount of responsibility compared to GPs aged under 34 years. GPs aged over 55 years were more satisfied with opportunities to use abilities. GPs were less satisfied with their hours of work if they were aged between 40 and 44 years and between 50 and 54 years, compared to GPs aged under 34 years. However, those aged over 60 years were more satisfied. GPs in this age group were also more satisfied with the amount of variety in their job.

White GPs were more satisfied with all domains, except for freedom to choose own method of working, remuneration, and recognition for good work where ethnicity was not significant. Married or cohabiting GPs were more satisfied with physical working conditions, but less likely to be satisfied with their remuneration. GPs with more children

aged under 18 years were more likely to be satisfied with the amount of responsibility given.

The effect of job characteristics on domain satisfactions also differed across equations. Those with a household income of between £85,000 and £120,000 were more satisfied with their remuneration compared to those with incomes of less than £40,000. The effect of household income on satisfaction with remuneration is not linear. Those with a household income of over £120,000 were more likely to be satisfied with the amount of variety in their jobs.

There were consistent effects of the GPs' type of contract of employment on most aspects of job satisfaction. PMS GPs (i.e. GPs paid by salary) were more satisfied than GP principals (i.e. self-employed partners in a practice) on most aspects of job satisfaction (except physical working conditions, and your colleagues and fellow workers). Similarly, GP non-principals (i.e. employees of practices) were more likely to be satisfied than GP principals with recognition for good work, colleagues and fellow workers, and hours of work. However, contract type is a choice variable and maybe endogenous.

GPs working long hours were less likely to be satisfied with all domains, apart from variety in the job, physical working conditions and colleagues and fellow workers. The length of time in their current post was not associated with any of the domain satisfactions.

There were also effects of the work environment on domain satisfactions. If a GP perceived that clinical governance had increased workload, then satisfaction with all domains was lower, except for colleagues and fellow workers.

Major changes in the structure of primary care with the introduction of new primary care organisations (PCOs) also influenced satisfaction with many domains. If the PCO had increased workload, then this was associated with lower satisfaction with freedom to choose own method of working, recognition for good work, remuneration, opportunity to use abilities, and hours of work. If GPs perceived the PCO to have improved co-operation amongst general practices, then satisfaction was higher with all aspects of work, apart from colleagues and fellow workers and hours of work where the effect was not significant.

Other aspects of work environment included location and deprivation of the patient population. GPs working outside of inner cities (apart from those in rural areas) had lower satisfaction with physical working conditions, freedom to choose own method of working, recognition for good work, and amount of responsibility given. Those GPs located in rural and semi-rural areas were less likely to be satisfied with their hours of work than GPs in inner cities.

GPs with relatively deprived patients were less satisfied with physical working conditions, freedom to choose own method of working, recognition for good work, amount of responsibility, remuneration, opportunities to use abilities, and hours of work.

GPs working in Scotland were less likely to be satisfied with physical working conditions.

Table 3 reports the results of overall job satisfaction. All of the domain satisfactions were significant in this model. The most important of these (with the largest coefficient) was satisfaction with hours of work, followed by recognition for good work, amount of variety, freedom to choose own method of working, remuneration, amount of responsibility given, opportunity to use abilities, colleagues and fellow workers, and physical working conditions.

No personal characteristics were associated with job satisfaction. The only statistically significant job characteristic was household income. Those with higher incomes had lower job satisfaction relative to those with a household income of less than £40,000, with this effect significant for those earning between £55,000 and £100,000. Some aspects of the work environment were also associated with overall job satisfaction. GPs who perceived PCOs to have increased their workload were less likely to be satisfied, while GPs who perceived the PCO to have increased quality of care and co-operation between general practices were more likely to be satisfied. GPs located in semi-rural and suburban areas or towns/cities were less likely to be satisfied than GPs located in inner cities.

However, many of these factors did not feed through to determining intentions to quit (see Table 3). A different set of variables predicted intentions to quit than predicted overall job satisfaction. The intentions to quit model also had lower explanatory power than the overall job satisfaction model. High overall job satisfaction was associated with low intentions to quit. Satisfaction with freedom to choose own method of working, and the amount of variety in the job were independently associated with intentions to quit. GPs' personal characteristics were more likely to be associated with intentions to quit, than with overall of job satisfaction. GPs who were married or cohabiting were more likely to quit, whereas GPs with more children aged under 18 years were less likely to quit. There was also a strong and positive effect of age on intentions to quit, with an obvious stronger effect as GPs approached retirement age. The only significant job characteristic was being a GP non-principal. This group of GPs were more likely to quit direct patient care. The level of household income had no effect. GPs working in Scotland were more likely to quit than GPs working in England.

## **5 Discussion**

The aim of this paper has been to identify those factors influencing GPs' job satisfaction and intentions to quit, with a view to improving the working lives and retention of GPs. The main methodological contribution has been the use of domain satisfactions as dependent and independent variables, and the simultaneous estimation of all equations that accounts for the correlations amongst error terms due to unobservables. The use of this approach confirmed the existence of correlations amongst the error terms, and the results were different from the separate estimation of the equations using OLS or ordered probit.

GPs' intentions to quit were determined primarily by overall job satisfaction, confirming the findings of previous studies (Clark, 2001; Shields and Ward, 2001). Only two of the nine domain satisfactions had a direct effect on intentions to quit: freedom to choose own method of working and the amount of variety in the job. This may be a reflection of the effect of clinical governance on job satisfaction that was significant in most of the other equations. Clinical governance may be perceived as a threat to clinical autonomy and the working practices of a largely self-employed profession.

GPs' personal characteristics were strongly associated with intentions to quit. The likelihood of quitting increased with age and GPs with more children were less likely to quit, confirming the similar result found by Shields and Ward (2001) for nurses. The only job characteristic that had a direct impact on intentions to quit was if the GP was a non-principal. This is initially a surprising finding, but not if one considers that GP non-principals may have chosen that option to be able to work more flexibly and take career breaks. The intentions to quit variable does not rule out that GPs may re-enter the workforce at a later stage. Nevertheless, ways of encouraging non-principals to stay in the workforce should be an important focus of policy.

Overall job satisfaction was primarily determined by the domain satisfactions, with no effect of GPs' personal characteristics such as gender, age or family circumstances. Satisfaction with hours of work was the most important domain, and remuneration was ranked fifth. The least important were colleagues and fellow workers and physical working conditions. High satisfaction with hours of work was in turn determined by numerous factors. Those amenable to policy change included actual hours worked, whether the GP was a PMS GP or a GP non-principal, and perceptions that PCOs and clinical governance had increased workload. GPs' actual hours were also negatively related to satisfaction with most of the other domains.

Few objectively measured job characteristics had an impact on overall job satisfaction. Household income had some impact, as did GPs' perceptions of the effects clinical governance and the new PCOs, and location. This provides some evidence that income could have an indirect effect on intentions to quit through its effect on overall job satisfaction. The finding of no effect of gender on job satisfaction is not consistent with the broader literature on job satisfaction, where women are usually more satisfied (Clark, 1997). However, Clark also finds that the gender differential disappears for the highly educated, professionals and those in male dominated workplaces, so our result is unsurprising and confirms that of Clark (1997).

There was a consistent effect of ethnicity in the domain satisfaction equations, with white GPs being more satisfied with most aspects of work compared to non-white GPs, although this did not directly influence overall job satisfaction or intentions to quit. The age of GPs was also a consistent predictor of domain satisfactions, although its precise effect varied across domains. GPs approaching retirement age were more likely to be satisfied, and middle-aged GPs were less likely to be satisfied. Age was not directly



associated with overall job satisfaction, but was strongly associated with intentions to quit.

PMS GPs were more likely to be satisfied with most domains compared to GP principals. These contracts offer benefits to both the GP and the NHS. GPs profit from less administrative responsibilities and more flexible working hours. The NHS benefits from reduced financial risk and less professional autonomy. Hence, expanding the range of contractual arrangements and employment opportunities may improve participation in the workforce. However, this is a choice variable and so GPs choosing a PMS contract may have already been more satisfied.

The effect of PCOs on satisfaction and intentions to quit had opposing effects. A perception that PCOs increased workload was associated with lower satisfaction, and a perception that they had improved co-operation or quality of care was associated with increased satisfaction. Therefore, the aggregate effect of integrated primary care organisations on GP job satisfaction and intentions to quit is negligible.

There are several caveats to this study. The first is the sensitivity of the job satisfaction measure. This was developed for use in many occupations and may not be sensitive enough to the specific concerns of GPs, particularly in the range of domains. For example, one anecdotal aspect of GPs' working lives is flexible working and the balance between work and family life, although this may have been picked up by the hours of work domain.

The second caveat is the use of continuous measures of job satisfaction and intentions to quit. This implies an acceptance of cardinal comparisons of utility from work. Although this corresponds with the large psychology literature, it does not fit with the current economics literature on job satisfaction. Nevertheless, the gains from the use of the SUR model were judged to have outweighed the potential gains from using separate ordered probit equations. No differences were found between models estimated individually using ordered probit or OLS. In practice, assumptions of whether utility is ordinal or cardinal made little difference.

A third caveat is that a categorical measure of household income was used rather than actual income of the GP. Although this would have helped to maximize the response to this question, it meant that it was more problematic to estimate the effect of relative and absolute wages, as has been done in other studies of job satisfaction (e.g. Clark and Oswald, 1996; Sloane and Williams, 1994). Nevertheless, comparative household income may still influence satisfaction and intentions to quit. Further work is required on the construction of a measure of relative or expected household income. This is possible using interval regression and will form part of the next iteration of this paper.

The main policy conclusion is that retention may be adversely affected by the impact of clinical governance on GPs' autonomy, as well as through the indirect effect of long hours of work on overall job satisfaction. The other domains of job satisfaction also play a role, including recognition for good work. There may be several ways to improve GPs'

autonomy, although it would be interesting to see if this reflects a general trend in the reduction of autonomy as a result of continuous health care reform and the increasing need for accountability. One way to reduce GPs' hours of work is to employ more GPs through enhanced recruitment. Further research is therefore needed on the determinants of other labour market decisions made by doctors more generally, before policies can be recommended to increase GP numbers. Objective job characteristics have little effect once domain satisfactions are included. Overall, non-pecuniary aspects of work are more likely to influence satisfaction and intentions to quit than pecuniary factors.

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**Table 1. Descriptive statistics.**

Variable	Mean	Std. Dev.	Min	Max
Country (England 0; Scotland 1)	.3150407	.4646501	0	1
Number of GPs in practice	5.307927	2.69962	0	30
Gender (female = 0; male = 1)	.6661585	.4717037	0	1
Typical hours worked per week	45.29472	14.81571	3	168
Months in current job	141.2419	103.5028	1	552
PMS GP	.1468496	.3540459	0	1
GP non-principal	.1102642	.3132984	0	1
Age	44.10671	8.352357	27	71
Ethnicity (0=non-white; 1 = white)	.8877033	.3158114	0	1
Married (1 = married of cohabiting; 0 = otherwise)	.8988821	.3015614	0	1
Total number of patients on list	8258.386	6196.208	65	96,500
Satisfaction with:				
Physical working conditions	4.745028	1.502806	1	7
Freedom to choose own method of working	4.386932	1.307772	1	7
Your colleagues and fellow workers	5.448135	1.193452	1	7
Recognition you get for good work	3.674359	1.469411	1	7
Amount of responsibility you are given	4.671963	1.49633	1	7
Your remuneration	3.561988	1.594856	1	7
Your opportunity to use your abilities	4.322895	1.349142	1	7
Your hours of work	3.433556	1.581568	1	7
Amount of variety in your job	4.765132	1.315887	1	7
Taking everything into consideration, how do you feel about your job?	4.035751	1.426356	1	7
Effect of PCO on workload (1=decreased a lot; 5 = increased a lot)	3.648867	.7899847	2	5
Effect of clinical governance on workload (1=decreased a lot; 5 = increased a lot).	3.707979	.766752	1	5
Effect of PCO on quality of care (1 = reduced; 5 = increased)	2.904059	.7271624	1	5
Effect of PCO on co-operation (1=none; 5 = a lot)	2.746982	1.131121	1	5
Number of children under 18 years old	1.346037	1.236488	0	8
Typical hours on call per week	14.98395	17.61544	0	168
Age 34 or less	.1371951	.3441407	0	1
Age 35 to 39	.1815325	.3920307	0	1
Age 40 to 44	.2047764	.4036407	0	1
Age 45 to 49	.183435	.3871211	0	1
Age 50 to 54	.1671748	.3732267	0	1
Age 55 to 59	.0919715	.2890592	0	1
Age 60 and over	.0259146	.158921	0	1

**Table 1 (cont.). Descriptive statistics.**

Variable	Mean	Std. Dev.	Min	Max
Household income:				
<£25k	.0045732	.0674876	0	1
£25k to £40k	.0594512	.2365274	0	1
£40k to £55k	.1382114	.3452094	0	1
£55k to £70k	.2855691	.4517999	0	1
£70k to £85k	.1976626	.3983374	0	1
£85k to £100k	.1595528	.3662839	0	1
£100k to £120k	.1001016	.3002117	0	1
Household income >£120k	.054878	.2277999	0	1
Location :				
Rural	.1117886	.3151863	0	1
Semi-rural	.2271341	.4190865	0	1
Suburban	.2271341	.4190865	0	1
Town/city	.3094512	.4623849	0	1
Inner city	.1244919	.3302258	0	1
Deprivation :				
Deprived	.0879065	.2832308	0	1
Mixed-poor	.2525407	.4345801	0	1
Average	.4166667	.493132	0	1
Mixed-well off	.2276423	.419417	0	1
Affluent	.0152439	.1225527	0	1
Likelihood of leaving direct patient care within 5 years (1 = none; 5 = high)	2.15034	1.360542	1	5

**Table 2. Regression analyses of domain satisfactions on GP characteristics and work attributes.**

Variable	Physical working conditions, $\beta$ (s.e.)	Choose method of working, $\beta$ (s.e.)	Colleagues and fellow workers, $\beta$ (s.e.)	Recognition for good work, $\beta$ (s.e.)	Amount of responsibility, $\beta$ (s.e.)	Remuneration, $\beta$ (s.e.)	Opportunity to use abilities, $\beta$ (s.e.)	Hours of work, $\beta$ (s.e.)	Amount of variety in job, $\beta$ (s.e.)
Gender	-0.667 (.0899)	.0689 (.0767)	.0846 (.0705)	-.0235 (.0844)	.0858 (.0873)	-.1570 (.0928)*	-.0958 (.0799)	.0876 (.0841)	.0021 (.0791)
Married	.3186 (.1323)**	.0871 (.1129)	.0983 (.1037)	-.0030 (.1242)	.0165 (.1285)	-.2405 (.1365)*	-.0723 (.1176)	-.1095 (.1238)	.0521 (.1164)
Country	-.4920 (.0840)**	-.0220 (.0717)	.0328 (.0658)	.0582 (.0788)	-.0162 (.0816)	-.0556 (.0867)	-.0946 (.0747)	.0488 (.0786)	.0377 (.0739)
Aged 35-39	-.1110 (.1341)	-.0150 (.1144)	-.0444 (.1050)	-.2288 (.1258)*	-.2506 (.1301)*	.0130 (.1383)	-.0237 (.1192)	-.1228 (.1254)	.0047 (.1179)
Aged 40-44	.0779 (.1419)	.0025 (.1211)	-.0132 (.1112)	-.2931 (.1332)**	-.3654 (.1378)**	-.0485 (.1464)	-.0519 (.1261)	-.2323 (.1328)*	-.0339 (.1248)
Aged 45-49	.0450 (.1531)	-.0395 (.1306)	.0370 (.1200)	-.1148 (.1437)	-.2789 (.1486)*	.0236 (.1579)	.0945 (.1361)	-.2168 (.1433)	-.0547 (.0134)
Aged 50-54	.0647 (.1715)	.1147 (.1463)	.0192 (.1344)	-.0500 (.1609)	.0722 (.1665)	.0735 (.1769)	.2291 (.1524)	-.2780 (.1605)*	-.0417 (.1508)
Aged 55-59	.2766 (.2112)	.3429 (.1802)*	.1626 (.1655)	.2713 (.1982)	.0746 (.2050)	.2498 (.2178)	.3131 (.1877)*	-.1441 (.1976)	.0659 (.1857)
Aged 60+	.1862 (.3241)	.3988 (.2765)	.1515 (.2540)	.6122 (.3041)**	.2415 (.3146)	.4862 (.3343)	.6584 (.2880)**	.7186 (.3032)**	.4921 (.2850)*
Size	.0012 (.0167)	-.0042 (.0142)	.0315 (.0131)**	.0395 (.0157)**	.0188 (.0162)	.0516 (.0172)**	.0277 (.0148)*	-.0052 (.0156)	.0171 (.0147)
List size	1.28e-6 (8.06e-6)	-8.72e-6 (6.88e-6)	-5.92e-6 (6.32e-6)	-7.99e-7 (7.57e-6)	9.31e-7 (7.83e-6)	5.88e-6 (8.32e-6)	-4.80e-6 (7.17e-6)	4.88e-6 (7.54e-6)	-4.77e-6 (7.09e-6)
Children < 18 years	.0410 (.3600)	.0205 (.0307)	.0236 (.0282)	.0177 (.0337)	.0737 (.0349)**	-.0259 (.0371)	.0105 (0.319)	-.0268 (.0336)	.0022 (.3165)
Hours worked/week	.0010 (.0028)	-.0055 (.0024)**	-.0006 (.0022)	-.0114 (.0026)**	-.0117 (.0027)**	-.0156 (.0029)**	-.0079 (.0025)**	-.0393 (.0026)**	-.0020 (.0025)
Tenure	.0004 (.0005)	-.0009 (.0004)*	-.0004 (.0004)	-.0006 (.0005)	-.0002 (.0005)	-.0008 (.0005)	-.0007 (.0005)	-.0003 (.0005)	.0002 (.0005)
PMS GP	-.0286 (.1057)	.2100 (.0901)**	-.0597 (.0828)	.1932 (.0991)*	.2607 (.1026)**	.3982 (.1090)**	.2258 (.0939)**	.2310 (.0989)**	.1754 (.0929)*
GP non-principal	-.0962 (.1322)	-.1176 (.1128)	.1766 (.1036)*	.2099 (.1240)*	-.0112 (.1283)	.1155 (.1363)	.0547 (.1175)	.2842 (.1237)**	.1030 (.1162)
Ethnicity	.4594 (.1294)**	.1581 (.1104)	.3940 (.1014)**	.1389 (.1214)	.5344 (.1256)**	.1150 (.1335)	.3830 (.1150)**	.2191 (.1211)*	.2960 (.1138)**
PCO workload	.0553 (0.579)	-.0870 (.0494)*	.0006 (.0453)	-.1298 (.0543)**	-.0636 (.0562)	-.1056 (.0597)*	-.0939 (.0514)*	-.1757 (.0541)**	.0579 (.0509)
CG workload	-.1595 (.0564)**	-.2618 (.0481)**	-.0463 (.0442)	-.2186 (.0529)**	-.2522 (.0547)**	-.2100 (.0581)**	-.1038 (.0501)**	-.1505 (.0527)**	-.1299 (.0496)**
PCO quality	.0570 (.0574)	.0415 (.0490)	.0691 (.0450)	-.0079 (.0539)	.0113 (.0557)	-.0416 (.0592)	.0395 (.0510)	.0450 (.0537)	.0833 (.0505)*
PCO co-operation	.0600 (.0363)*	.1674 (.0310)**	.0105 (.0285)	.2211 (.0341)**	.1651 (.0353)**	.1715 (.0375)**	.1953 (.0323)**	.0132 (.0340)	.1526 (.0319)**
Inc £40k – 55k	-.0075 (.1793)	.0516 (.1530)	.0178 (.1405)	-.1045 (.1682)	-.1354 (.1741)	-.0064 (.1849)	-.1782 (.1594)	.0919 (.1678)	.1005 (.1577)
Inc £55k – 70k	.0243 (.1702)	.0994 (.1452)	.0664 (.1334)	-.0415 (.1597)	-.0179 (.1652)	.1591 (.1756)	.0155 (.1513)	-.0443 (.1593)	.0684 (.1497)
Inc £70k – 85k	.1029 (.1782)	.1498 (.1520)	.1458 (.1396)	.0104 (.1672)	.0490 (.1730)	.2684 (.1838)	-.0327 (.1584)	.1374 (.1667)	.1512 (.1567)
Inc £85k – 100k	-.1385 (.1835)	.1764 (.1566)	-.0051 (.1438)	.0345 (.1722)	.0666 (.1781)	.5537 (.1893)**	-.1056 (.1631)	.2730 (.1717)	.1612 (.1614)
Inc £100k – 120k	.0724 (.1988)	.2355 (.1696)	.1014 (.1558)	-.0384 (.1865)	.0676 (.1930)	.4506 (.2050)**	.1282 (.1767)	.1772 (.1860)	.2621 (.1748)
Inc £120k+	-.0692 (.2270)	.3146 (.1937)	.1539 (.1779)	-.0681 (.2130)	.1223 (.2204)	.2037 (.2341)	.1339 (.2018)	.0669 (.2124)	.4511 (.1996)**

**Table 2 (cont.). Regression analyses of domain satisfactions on GP characteristics and work attributes.**

Variable	Physical working conditions, $\beta$ (s.e.)	Choose method of working, $\beta$ (s.e.)	Colleagues and fellow workers, $\beta$ (s.e.)	Recognition for good work, $\beta$ (s.e.)	Amount of responsibility, $\beta$ (s.e.)	Remuneration, $\beta$ (s.e.)	Opportunity to use abilities, $\beta$ (s.e.)	Hours of work, $\beta$ (s.e.)	Amount of variety in job, $\beta$ (s.e.)
Rural	-0.745 (.1643)	-0.956 (.1401)	.0840 (.1287)	-0.0016 (.1541)	.1436 (.1594)	.2781 (.1694)	.1221 (.1460)	-.3717 (.1537)**	.1856 (.1444)
Semi-rural	-3.191 (.1446)**	-2.484 (.1234)**	-0.336 (.1133)	-2.452 (.1356)*	-1.210 (.1404)	-0.994 (.1491)	-1.212 (.1285)	-3.464 (.1353)**	-1.529 (.1271)
Suburban	-2.406 (.1431)*	-2.576 (.1221)**	-0.746 (.1121)	-2.671 (.1342)**	-2.406 (.1389)*	-0.907 (.1476)	-1.620 (.1272)	-1.012 (.1339)	-1.1876 (.1258)
Town/city	-2.196 (.1285)*	-1.855 (.1096)*	-0.642 (.1107)	-0.314 (.1205)	-1.448 (.1247)	-0.696 (.1325)	-0.111 (.1142)	-0.940 (.1202)	-1.009 (.1129)
Deprived	-6.414 (.1601)**	-3.833 (.1366)**	.1044 (.1254)	-3.759 (.1502)**	-2.904 (.1554)*	-1.079 (.1651)	-3.088 (.1423)**	-3.324 (.1498)**	-1.851 (.1408)
Mixed-poor	-6.023 (.1085)**	-4.256 (.0926)**	-1.268 (.0850)	-4.042 (.1018)**	-2.972 (.1054)**	-1.876 (.1119)*	-3.411 (.0965)**	-3.429 (.1015)**	-1.407 (.0954)
Average deprivation	-3.422 (.0931)**	-2.219 (.0794)**	.0215 (.0729)	-1.1702 (.0873)*	-0.847 (.0904)	-0.291 (.0960)	-1.690 (.0827)**	-2.474 (.0871)**	-0.0601 (.0818)
Constant	5.060 (.3800)**	5.497 (.3242)**	4.784 (.2978)**	5.029 (.3565)**	5.524 (.3689)**	4.882 (.3919)**	4.681 (.3377)**	6.512 (.3555)**	4.055 (.3341)**
N	1,673	1,673	1,673	1,673	1,673	1,673	1,673	1,673	1,673
Pseudo R <sup>2</sup>	0.08	0.10	0.04	0.13	0.11	0.13	0.10	0.25	0.06
Chi <sup>2</sup> on full model	137.3399**	187.066**	63.69898**	259.8808**	208.0089**	249.4743**	182.0514**	545.0549**	107.7155**

Notes: \*\* p < 0.05; \* p < 0.10.



**Table 3. Regression analyses of job satisfaction and intentions to quit.**

Variable	Job satisfaction, $\beta$ (s.e.)	Intentions to quit, $\beta$ (s.e.)
<b>Job satisfaction</b>	-	-.3043 (.0306)**
<b>Physical working conditions</b>	.0446 (.0157)**	.0125 (.0197)
<b>Choose method of working</b>	.1361 (.0206)**	-.0790 (.0262)**
<b>Colleagues and fellow workers</b>	.0697 (.0193)**	-.0008 (.0244)
<b>Recognition for good work</b>	.1985 (.0191)**	.0041 (.0248)
<b>Amount of responsibility</b>	.0838 (.0178)**	.0176 (.0226)
<b>Remuneration</b>	.1082 (.0166)**	.0116 (.0211)
<b>Opportunity to use abilities</b>	.0946 (.0212)**	.0388 (.0268)
<b>Hours of work</b>	.2261 (.0173)**	.0048 (.0228)
<b>Amount of variety in job</b>	.1911 (.0190)**	-.0428 (.0245)*
<b>Gender</b>	-.0622 (.0524)	-.0262 (.0658)
<b>Married</b>	-.0487 (.0771)	.2204 (.0968)**
<b>Country</b>	-.0020 (.0494)	.1846 (.0620)**
<b>Aged 35-39</b>	-.0798 (.0781)	.1665 (.0980)*
<b>Aged 40-44</b>	-.0746 (.0828)	.2253 (.1039)**
<b>Aged 45-49</b>	-.0084 (.0892)	.2838 (.1119)**
<b>Aged 50-54</b>	-.0155 (.0999)	.7640 (.1254)**
<b>Aged 55-59</b>	-.1012 (.1230)	2.38 (.1544)**
<b>Aged 60+</b>	.0268 (.1887)	2.387 (.2368)**
<b>Size</b>	.0105 (.0097)	-.0009 (.1227)
<b>List size</b>	7.08e-6 (4.69e-6)	-8.71e-6 (5.89e-6)
<b>Children &lt; 18 years</b>	.0198 (.0209)	-.0966 (.0263)**
<b>Hours worked/week</b>	.0018 (.0017)	-.0024 (.0022)
<b>Tenure</b>	-.0004 (.0003)	.0004 (.0004)
<b>PMS</b>	-.0396 (.0618)	.0289 (.0775)
<b>GP non-principal</b>	-.0673 (.0771)	.2045 (.0968)**
<b>Ethnicity</b>	.0551 (.0761)	.1067 (.0954)
<b>PCO workload</b>	-.0633 (.0338)*	.0341 (.0424)
<b>CG workload</b>	-.0290 (.0331)	.0294 (.0416)
<b>PCO quality</b>	.0620 (.0334)*	-.0617 (.0419)
<b>PCO co-operation</b>	.0490 (.0216)**	-.0258 (.0271)
<b>Inc £40k – 55k</b>	-.1583 (.1043)	.0264 (.1309)
<b>Inc £55k – 70k</b>	-.1847 (.1043)*	-.0127 (.1243)
<b>Inc £70k – 85k</b>	-.2183 (.1037)**	-.0594 (.1302)
<b>Inc £85k – 100k</b>	-.2719 (.1072)**	-.1076 (.1347)
<b>Inc £100k – 120k</b>	-.1153 (.1158)	-.0181 (.1453)
<b>Inc £120k+</b>	-.1712 (.1322)	.1214 (.1660)

**Table 3 (cont.). Regression analyses of job satisfaction and intentions to quit.**

<b>Variable</b>	<b>Job satisfaction, β (s.e.)</b>	<b>Intentions to quit, β (s.e.)</b>
<b>Rural</b>	-.0281 (.0959)	-.0299 (.1203)
<b>Semi-rural</b>	-.1664 (.0843)**	.0601 (.1058)
<b>Suburban</b>	-.1391 (.0833)*	.0073 (.1046)
<b>Town/city</b>	-.1384 (.0747)*	-.0740 (.0938)
<b>Deprived</b>	-.0593 (.0937)	-.0219 (.1176)
<b>Mixed-poor</b>	-.0367 (.0639)	-.0640 (.0802)
<b>Average deprivation</b>	-.0236 (.0544)	.0274 (.0683)
<b>Constant</b>	-.0458 (.2617)*	3.023 (.3286)**
<b>N</b>	1,673	1,673
<b>Pseudo R<sup>2</sup></b>	0.65	0.39
<b>Chi<sup>2</sup> on full model</b>	3,127.568**	1,070.78**

Notes: \*\* p < 0.05; \* p < 0.10.