

**Work in progress – please do not quote.**

**Stylised facts about doctors' job satisfaction**

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*Abstract*

This paper presents findings on what factors influence doctors' job satisfaction. This has implications, not just for recruitment and retention of medical staff in the NHS, but also because labour economists have shown that job satisfaction is closely related to labour market outcomes. The effect of comparison income on job satisfaction will also be investigated, using data from a survey of 518 non-consultant career grade doctors in the NHS Scotland (a response rate of 58.2%).

Ordered probit models are estimated to ascertain the effects of demographic and job characteristics on the domains of job satisfaction and on the effects of domain satisfactions on overall job satisfaction. An attempt is also made to contribute to the debate on the relative importance of pecuniary versus non-pecuniary aspects of doctors' jobs.

The results show significant sub sample gender differences in job satisfaction. Domains of job satisfaction, NHS income, non-NHS work, GP training and hospital size have significant impacts on doctors' overall job satisfaction. There is little evidence to suggest that pecuniary factors are more important in determining overall job satisfaction.

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## **1. Introduction**

The need to train and recruit more doctors for the United Kingdom National Health Service (NHS) became perceptible, following planned increases in NHS spending, as announced in the 2002 budget broadcast<sup>1</sup>, and following recommendations from the Wanless Report (2002). It is important to find ways to attract potential doctors into the NHS by promoting those aspects of the job, which drive doctors' utility. Equally important is the need to retain those that are currently employed. The UK government has set ambitious targets for the recruitment of hospital consultants as a way to increase capacity in the NHS, and the proportion of hospital doctors who are consultants has been rising steadily, from 34% in 1999 to about 35% in 2000 (Review Body on Doctors' and Dentists' remuneration, 2002). A 'forgotten' group of senior hospital doctors is non-consultant career grade (NCCG) doctors. They comprised about 18% of all hospital medical and dental staff in the UK NHS in 2000. They are primarily those holding associate specialist and staff grade posts (Review Body on Doctors' and Dentists' Remuneration, 2002) and also include hospital practitioners and clinical assistants, although different job titles are often assigned to these groups (BMJ, 2001).

NCCG posts are outside of the main career structure that produces hospital consultants, and the transition from NCCG to consultant is difficult. Staff grade and associate specialist posts were created to cater for doctors who do not wish to become consultants, who are not sufficiently qualified to become consultants, and for doctors who wish to have a more flexible job, work part-time and not have the responsibility that a consultant post brings (Department of Health, 1987). A recent survey found that a significant minority undertake similar work to consultants. Most feel that they are qualified to move to a consultant post, but are not rewarded for their level of experience. There is little career progression as most are at the top of their salary scale. They also feel that their contribution to the NHS is unrecognised and have few training and development opportunities (Review Body on Doctors' and Dentists' Remuneration, 2002). This confirms previous research that found that they do not have opportunities for continued professional development and career progression

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<sup>1</sup> 43% rise in NHS spending over next five years - equivalent of £40bn  
([http://news.bbc.co.uk/1/hi/uk\\_politics/1933547.stm](http://news.bbc.co.uk/1/hi/uk_politics/1933547.stm))

where it is desired (SCOPME, 1994; RCP, 1996; Baker *et al.*, 1999; Norcliffe and Finlan, 2001).

The objective of this research is to investigate the preferences of non-consultant career grade doctors, as well as intentions to alter their contracted sessions, with a view to find out ways to enhance the recruitment and retention of senior doctors. Labour economists have increasingly employed job satisfaction studies to investigate workers' job preferences. How workers perceive their work has been shown to affect economic outcomes such as productivity (Triandis, 1959; Herman, 1973; Levin and Stephan, 1991; Hamermesh, 1999), worker behaviour (Mangione and Quinn, 1975; Freeman, 1978; Clegg, 1983; McEvoy and Cascio, 1985; Arkelof *et al.*, 1988), turnover (Mobley, 1977; Bailie *et al.*, 1998), absenteeism (Steers and Rhodes, 1978) and overall employment costs (Mirvis and Lawler, 1977). Job satisfaction is also reported to be one of the three most important predictors of overall well-being (Argyle 1989; Van Praag and Ferrer-i-Carbonell 2002) and may be the closest proxy measure of utility at work (Bailie *et al.* 1998). It is correlated with patient satisfaction and has an influence on patients' health outcomes (Grol *et al.* 1985).

## **2. Methods**

### **2.1. Data**

Data were collected using a questionnaire administered to all 1094 career grade doctors in NHS Scotland. Addresses were obtained from the Medical and Dental Census held at the Information and Statistics Division (ISD) of NHS Scotland, for September 2001. The contents of the questionnaire were informed by an extensive literature review (French, 2000), focus groups and interviews with participants representing various specialties, gender and contract types.

The questionnaire asked doctors, among other personal and work characteristics, how satisfied they were with their job as a whole. Doctors were also asked how satisfied they were with nine aspects (domains) of their job, such as physical working conditions, remuneration and amount of work variety. These were measured on a scale of 1 – 7, where 1 meant 'extreme dissatisfaction' and 7 meant 'extreme satisfaction'. These scales were developed and validated by Warr, Cook and Wall (1979) and have been used previously in measuring job satisfaction for GPs (Sibbald,

2000; Scott *et al.* 2002). Rating scales (and other modifications of it) have also been used to elicit job satisfaction, as in SCELI (1986), Miller (1990), Clark and Oswald (1993), Sutherland and Cooper (1993), Clark and Oswald (1996), Ruth *et al.* (1996), Clark (1997), Clark (2001), Van Praag *et al.* (2002) and Van Praag and Ferer-i-Carbonell (2002).

## **2.2. Model Specification**

Most recent economic and psychological analyses of job satisfaction have used the ordered latent response model (for example, Zavoina and McKelvey 1975; Clark 1997; Levy-Garboua and Montmarquette 1997; Sousa-Poza and Sousa-Poza 2000; and Hamermesh 2001).

Doctors' utility from working is evaluated as a latent response model of their self-reported job satisfaction. Their reported satisfaction levels are treated as proxy utility data, based on the assumption of meaningful interpersonal comparisons of utility. It is assumed that individual doctors do not differ in their interpretation of questions and measurement scales used. Overall job satisfaction is modeled as a function of nine different domains of job satisfaction, doctors' characteristics and job attributes. We also model their overall job satisfaction without the domain satisfactions in a bid to ascertain whether (and by how much) the domains contribute to explaining overall job satisfaction.

### *Model 1: Domain job satisfaction*

$$DS_i = DS(X, A) \quad (1)$$

Where  $DS_i$  = Domains of job satisfaction, with  $i$  representing nine different domains of job satisfaction<sup>2</sup>;  $X$  = NCCGs' characteristics and  $A$  = job attributes.

### *Model 2: Overall job satisfaction (with domains)*

$$JS = JS(DS_1, \dots, DS_9, X, A) \quad (2)$$

Where  $JS$  = Overall job satisfaction;  $DS_1$  to  $DS_9$  = Nine domains of job satisfaction.  $X$  and  $A$  are as defined above. In model 2,  $X$  and  $A$  are expected to capture effects of

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<sup>2</sup> These domains are satisfaction with physical working conditions, freedom to choose own method of work, colleagues, recognition for good work, amount of responsibility given, pay, opportunity to use abilities, hours of work and amount of job variety.

doctor characteristics and job attributes, over and above their direct effects on the domain satisfactions.

### **2.3. Hypotheses**

All hypotheses are related to model 2. The domain satisfactions, four hypotheses relating to doctors' jobs and five hypotheses relating to their personal characteristics will be tested. The following hypotheses are being tested;

#### **Domains of job satisfaction**

The domains of job satisfaction are expected to have significant individual and joint effects on doctors' overall job satisfaction.

#### **Job attributes**

##### *NHS Income*

Most economists are reported to believe that utility depends on absolute income (Clark and Oswald, 1996). It is expected that overall job satisfaction will be high if NHS income is high. In the sample data, the NHS income variable is measured in 5 bands (between £0 and £80,000 per annum). NHS income dummies have been calculated to represent three categories, namely income 1 (less than £20,000 per annum), income 2 (between £20,000 and £34,999 per annum) and income 3 (more than £35,000) per annum. These categories have been informed by the distribution of the NHS income variable as measured by the survey.

##### *Relative/comparison income*

There is an issue of relative deprivation, which suggests that workers compare their present income level with some expected level and that this influences utility. The effect of relative/comparison income thus depends on whether expected income is greater than or less than actual income. The worker will feel more deprived if his expected income is larger than his actual income, all things being equal. Clark and Oswald (1996) argue that satisfaction may be more strongly correlated with relative income than absolute income. The relative income variable has been calculated as the difference between what doctors presently earn and their expected income (calculated from an interval regression of doctors' banded income on their personal and job attributes – see authors for methods).

*NHS sessions (hours of work)*

An inverse relationship is expected between number of sessions and job satisfaction. Some studies have confirmed this (Clark and Oswald 1996; Clark 1997; Shields and Ward 2001). Number of sessions (instead of number of hours) was considered a more important measure of the supply of doctors' labour in focus group discussions at the time when the questionnaire were being developed. The sessions variable has been split into two to represent NHS sessions and academic/research sessions. An average session lasts 3.5 hours.

*Size (teaching or non-teaching hospital)*

Job satisfaction is expected to be lower in large establishments, relative to small ones. Sloane and Williams (1994) show that when there are no controls for attributes of work environment, job satisfaction (net of wages and fringe benefits) is lower in larger establishments. For GPs job satisfaction is expected to be higher in smaller practices where individual responsibility and participation in decision-making is greater (Gosden *et al.*, 2002). This research uses a dummy variable reflecting teaching and non-teaching hospitals as a proxy measure of hospital size.

**Personal characteristics**

*Age*

The most significant age effects on job satisfaction have been u-shaped (Clark and Oswald 1996; Clark 1997; Shields and Ward 2001; Van Praag *et al.* 2002). This means that the older are more satisfied than the younger workers. The variable measuring doctors' age has been used to generate a dummy variable with four categories reflecting the distribution of the age variable.

*Health state*

Job satisfaction is expected to rise with the level of self-reported physical health. Because of the distribution of the health variable, a dummy variable is created to represent excellent health and non-excellent health.

*Marital status and Number of children*

The effect, on job satisfaction, of living with a partner or having children will also be evaluated. This may be varying, depending on family and or job circumstances.

### *Gender*

“It is generally found that women express themselves as more satisfied at work than men” (Sloane and Williams, 1994). Clark (1997) argues that men are more concerned with ‘extrinsic’ aspects of work such as pay and promotion, whereas women are more likely to value the ‘intrinsic’ returns to work such as good relations with managers, actual work itself and hours of work. Gender effects on job satisfaction will be tested.

### *Ethnicity*

White doctors are expected to be more satisfied than non-white doctors. The variable on ethnicity has been used to explain variations in a number of health care related topics. Our ethnicity variable contains two categories; whites and non-white. This is because white doctors constitute more than 76% of the sample of doctors for these analyses (again, a question of the distribution).

Other variables used in estimating models of job satisfaction include the following; grade (e.g. associate specialists, staff grade), whether doctors have had GP training, whether doctors aspire to consultant career, whether doctors work weekends, whether they do non-NHS work, whether they have modified their career to accommodate their partner, hospital location, whether doctors take meal breaks during work, whether they take their full annual leave entitlement and what specialties they work in.

All hypotheses will be evaluated accordingly. The effects of the domains of job satisfaction on overall job satisfaction will be evaluated by comparing model fit and corresponding log likelihood ratios between the job satisfaction models (with and without the domains). Simple likelihood ratio tests of significance will be employed to determine the statistical significance of variables and to test the other hypotheses.

## **3. Results**

Summary statistics of doctors’ overall job satisfaction, also showing gender differences, are presented in Table 1. Female doctors report higher levels of overall job satisfaction than their male counterparts. They are also more satisfied with eight out of the nine domains of job satisfaction. Other descriptive statistics of variables used are presented in Table 2.

### **3.1 Determinants of domain satisfactions**

Regression results for all nine domains are statistically significant at a 5% level. Various job attributes and personal characteristics significantly influence doctors' satisfaction with the domains of job satisfaction, which in turn determine their overall job satisfaction.

#### **Job attributes**

Associate specialists are more satisfied with pay and opportunities to use their abilities, and like Staff grades, are less satisfied with the physical working conditions. Doctors working in city hospitals are associated with higher satisfaction with freedom to choose their own method of work, their colleagues and fellow workers, recognition they get for good work, pay, opportunities to use their abilities and amount of job variety. Those earning between £20,000 and £35,000 per annum, are more satisfied with the amount of job variety and less satisfied with the recognition for good work and the hours of work. Also, doctors are associated with higher levels of satisfaction with the amount of job variety and opportunities to use abilities if they earn more than £35,000 per year. They are also less satisfied with hours of NHS work. Higher relative incomes are associated with lower levels of satisfaction with colleagues, opportunities to use abilities and amount of job variety.

Doctors who work in larger hospitals (for example, teaching hospitals) report lower satisfaction with pay and hours of NHS work, while those who travel longer distances to work report lower levels of satisfaction with colleagues and the amount of responsibility given. Differences between specialties show that while those in anaesthesia, psychiatry and oral medicine are satisfied with hours of NHS, general surgeons are not. Also, while higher satisfaction with physical working conditions is reported for doctors in anaesthesia, those in paediatrics report lower satisfaction with physical working conditions. Doctors in anaesthesia are also associated with higher satisfaction with freedom to choose own method of work, recognition for good work, amount of responsibility given, pay, opportunities to use abilities and amount of job variety. Those in paediatrics are less satisfied with recognition for good work. Those in lab medicine are satisfied with the freedom to choose their own method of work and recognition for good work. Doctors in psychiatry are also associated with higher satisfaction with freedom to choose their own method of work, amount of

responsibility given, pay opportunities to use their abilities and amount of job variety. Doctors in obstetrics and gynaecology are less satisfied with amount of responsibility given; those in oral medicine are more satisfied with their colleagues and fellow workers, recognition for good work, amount of responsibility given, pay, abilities and job variety; those in accidents and emergencies are more satisfied with job variety. Doctors specialising in radiology are not significantly associated with any domain satisfactions.

Doctors working more NHS sessions are satisfied with recognition for good work, while those working more academic/university sessions are satisfied with their colleagues and amount of job variety. Those who have previously had GP training are associated with higher satisfaction with physical working conditions and freedom to choose their own method of working, while those who aspire to consultant status are less satisfied with freedom to choose own method of work, colleagues, recognition for good work, amount of responsibility given, pay, opportunities to use abilities and work hours. Those who work weekends (relative to those who don't) are more satisfied with freedom to choose own method of work and amount of job variety, while they are less satisfied with work hours. Doctors are more satisfied with work hours and amount of job variety if they do non-NHS work, while they are less satisfied with pay if they take their full annual leave entitlements.

### **Personal characteristics**

There are significant effects of gender, ethnicity, age, health, marital status and having children, on the domains of job satisfaction. For example, being male is associated with lower satisfaction with pay, opportunities to use abilities and amount of job variety. White doctors are associated with higher satisfaction with freedom to choose own method of work, colleagues, work hours and amount of job variety. Younger doctors report lower satisfaction with freedom to choose own method of work, colleagues and recognition for good work, while their older counterparts report higher satisfaction with physical working conditions, freedom to choose own method of work, colleagues, recognition for good work and pay. Those who report excellent health are associated with higher levels of satisfaction with physical working conditions, freedom to choose own method of work, recognition for good work, amount of responsibility given, work hours and amount of job variety. The effect of

meal breaks is consistently significant for all the domains. For example, a doctor who normally takes meal breaks during work is more satisfied with all the nine domains of job satisfaction than the doctor who does not normally take meal breaks.

The effects of family circumstances are varied. NCCG doctors who are married or live with a partner are associated with higher satisfaction with colleagues, amount of responsibility given and the amount of job variety. However, they are less satisfied with their colleagues, responsibility given, opportunities to use abilities and work hours if they have modified their career to suit their partners' career. The effects of having children (on the domains of job satisfaction) depend on the age of the children. For example, a doctor having a child (aged 0-5) is associated with lower satisfaction with recognition for good work. He is more satisfied with physical working conditions and amount of responsibility given if he has children aged between 5 and 12. Doctors are also more satisfied with physical working conditions, freedom to choose own method of working and their colleagues, if they have at least one teenage child.

### ***3.2 Determinants of overall job satisfaction***

The domains of job satisfaction are included in a model of overall job satisfaction in a forward stepwise manner, to ascertain their effects. The log likelihood ratio reduces (hence the pseudo  $R^2$  increases) each time a new domain is introduced. For example, the pseudo  $R^2$  increases from about 8% (without any of the domains) to about 43% (with all the domains included in the model). Likelihood ratio tests are also employed to determine whether the domains are significantly different from zero. The results show that each domain had a statistically significant and positive effect on overall job satisfaction.

#### ***3.2.1 Determinants of NCCG doctors' overall job satisfaction.***

The overall job satisfaction model with the domains is statistically significant at a 5% level (see table 3). All nine domains of job satisfaction are statistically different from zero and positively associated with overall job satisfaction. In addition to their effects on the domains of job satisfaction, a number of doctor and job characteristics have a direct effect on overall job satisfaction. As expected, doctors on higher incomes are more satisfied than those on lower incomes. For example, doctors earning above

£35,000 per annum are associated with higher levels of overall job satisfaction. Also significantly associated with higher satisfaction are doctors who have previously trained as a GP, those who do non-NHS work, those who report excellent health, who normally take meal breaks during work. Having at least one adult child, working in a large hospital and specialising in lab medicine are all related to higher overall job satisfaction.

However, staff grades and associate specialists are found to be less satisfied. Our results show that associate specialists could be less satisfied than staff grades. Those who took their full annual leave entitlements, as well as those doctors who work in accident and emergency (A&E) report lower levels of overall job satisfaction. Some family characteristics (like having children between 5 and 18) are associated with lower overall job satisfaction.

The age variable, though insignificant, shows some slight U-shaped effects. The results also show that relative incomes do not determine doctors' overall job satisfaction. There are also no significant effects of gender, location, distance to work and number of sessions.

### *3.2.2 Gender differences*

The need to evaluate potential gender differences in overall job satisfaction for NCCG doctors partly arises from labour concerns of gender discrimination with earnings (e.g. Joshi and Newel 1987; Wright and Ermisch 1991) and promotion (e.g. Lazear and Rosen, 1990). By September 2000, 53% female NCCG doctors worked part time (ISD online), while there are an increasing number of female medical graduates.

The gender variable was not significant in most of the regressions<sup>3</sup>. However, splitting the sample by gender produced statistically significant differences<sup>4</sup>. For example, there were gender differences in the determinants of domain satisfactions for job characteristics such as specialities, NHS sessions, weekend work and hospital size. . Male doctors in general surgery, lab medicine and paediatrics were consistently associated with higher levels of satisfaction (than females) with recognition for good

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<sup>3</sup> The only significant results on gender were found in satisfaction with pay, abilities and variety.

<sup>4</sup> Results on request.

work, opportunities to use abilities and work hours respectively. Those who worked weekends were also more satisfied with pay than females. Alternatively, female doctors working more NHS sessions per week were associated with higher levels of satisfaction with the amount of responsibility given than their male counterparts working the same total number of sessions per week. They also reported higher levels of satisfaction (with amount of responsibility) than males if they worked weekends. Satisfaction with opportunities to use abilities was higher among females who worked weekends than males who also did similar work on weekends.

Significant gender differences were also driven by doctors' personal characteristics such as having a partner or children, ethnic background, health state and career aspirations. For example, a male doctor with a child was associated with greater satisfaction with freedom to choose his own method of work than his female counterpart. He was also more satisfied with pay (than the female doctor) if he reported excellent health. A white female doctor was more satisfied with the amount of responsibility given than the white male given an equal amount of responsibility. Female doctors also reported higher satisfaction with recognition, pay, abilities and variety if they had a partner or aspired to consultant status.

The models on overall job satisfaction also produced some significant sub-sample gender differences. The only significant difference with the nine domains was the negative association between satisfaction with freedom to choose own method of work and overall job satisfaction, reported by male doctors. For female doctors, satisfaction with freedom to choose own method of work was positively associated with their overall job satisfaction. Also, there were noticeable gender differences in overall job satisfaction for doctors who worked weekends and for those who specialised in general surgery. For example, female doctors in general surgery reported higher overall job satisfaction than males, while male doctors who worked weekends were associated with higher overall job satisfaction than females who did similar weekend work.

#### **4. Discussion**

This research set out to model NCCG doctors' job satisfaction, using ordered probit techniques to model determinants of job satisfaction. The results confirmed previous

findings in which females reported higher levels of job satisfaction than males doing similar jobs (for example, Clark 1993; Sutherland and Cooper 1993; Sloane and Williams 1994; Clark 1997; Shields and Ward 2001; Gosden *et al.* 2002). In particular, the results confirmed that domains of job satisfaction, NHS income, previous GP training, hospital size, children, health, specialty and non-NHS medical work, among others, were significant determinants of NCCG doctors' job satisfaction.

The significance of the determinants of domain satisfactions confirmed that doctors' job attributes and personal characteristics influenced their overall job satisfaction through the domains. Besides, the marked improvement in overall job satisfaction results following the inclusion of the domains of job satisfaction was clear indication of the importance of the domains in evaluating overall job satisfaction.

Our results confirmed earlier findings, and therefore validated some of our stated hypotheses. For example, evidence of positive effects of income on job satisfaction was also reported by Inglehart (1990), Diener *et al.* (1995), Gerlach and Stephen (1996), Veenhoven (1997) and Shields and Ward (2001). Like in Clark and Oswald (1996) and later Clark (1997), doctors' overall job satisfaction rose with the level of self reported health. The effect of having children was varied and depended on the children's' age. For example, higher job satisfaction for doctors who had children above 18 years old was in line with positive effects of having children as reported by Shields and Ward (2001). In like manner, the effect of having children below 18 years old was negative on doctors job satisfaction (as in Dumelow, 2000). However, contrary to earlier findings (Sloane and Williams 1994; Gosden *et al.* 2002), doctors' overall job satisfaction was higher in large hospitals. This relationship may be driven by the preponderance of opportunities for training that exist in larger hospitals. NCCG doctors may be happy with the opportunities to gain experience in larger hospitals (such as teaching hospitals).

Some of our hypotheses (stated earlier) could not be validated because key variables such as comparison income, total number of sessions and age were not significant determinants of doctors' overall job satisfaction. The comparison income variable was not a significant determinant of doctors' overall job satisfaction. Higher comparison incomes were found to negatively impact on job satisfaction (Clark and Oswald 1996;

Shields and Ward 2001; Van Praag *et al.* 2002). A possible reason for the non-significance of the comparison income variable may be because the initial questionnaire did not set out to induce doctors to think in terms of comparing their present income levels to some expected levels. Also, sample variations in income were very small to show any significant differences.

Unlike Clark (1997) and Shields and Ward (2001) who found that hours of work were negatively related to job satisfaction, doctors' total number of sessions did not significantly determine their levels of overall job satisfaction. Even though our results showed some signs of u-shaped age effects on job satisfaction (as confirmed by Cambell *et al.* 1976; Ryff 1995; Shields and Ward 2001; Van Praag *et al.* 2002), the age variable was not a significant determinant of doctors' overall job satisfaction.

There was insufficient evidence to suggest the relative importance of pecuniary job characteristics over non-pecuniary ones. However, among the nine domains of job satisfaction, there were no significant pecuniary effects on satisfaction with physical working conditions, freedom to choose own method of work, amount of responsibility given and pay. Also, alternative estimations of the job satisfaction model<sup>5</sup> showed that the most important domain (with the highest average job satisfaction level) was satisfaction with colleagues and fellow workers, while the least important was satisfaction with pay. This suggests that efforts aimed at improving the job satisfaction of NCCG doctors, should aim at the pecuniary, as well as the non-pecuniary aspects of doctors' jobs.

There may be possible reasons why our results were different from the general literature on job satisfaction. The first and most important is the professional group forming the background to this study, which presents a highly educated workforce that may behave differently from the general workforce. Also, the nature of our data provides little sample variations between doctors, hence the non-significance of the effects of total number of sessions and comparison income. Furthermore, the inclusion of the domains of job satisfaction in a model of overall job satisfaction introduced a slight deviation from normal job satisfaction models.

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<sup>5</sup> Using OLS techniques. The results are not reported.

The greatest challenge faced by this research was the problem of trying to measure and analyse subjective labour market behaviour. A basic assumption was made as to the fact that the doctors were rational in their responses to the subjective questions posed in the questionnaire on job satisfaction. Ordinality of job satisfaction was assumed, with the intention of presenting concise and succinct options to the respondents. Doctors' reported satisfaction levels were also treated as proxy utility data, based on the assumption that interpersonal comparisons of utility were meaningful. We therefore analysed variations in overall job satisfaction with objective as well as subjective explanatory variables. Due to the nature of job satisfaction and the nature of the health care labour market, these assumptions and simplifications had to be made to give an insight into a concept, which could possibly affect health care delivery in NHS Scotland. The focus of research should be on attempts to provide more objective measures of labour market behaviour in health care.

**Table 1: summary statistics of gender differences in doctors' job satisfaction**

Domain	Mean satisfaction			Minimum satisfaction	Maximum satisfaction
	Male	Female	All doctors		
Overall	4.32	4.83	4.67	1	7
Physical	4.29	4.19	4.22	1	7
Freedom	4.18	4.65	4.50	1	7
Fellows	4.77	5.22	5.07	1	7
Recognition	3.85	4.19	4.07	1	7
Responsibility	4.66	4.88	4.80	1	7
Pay	3.31	3.69	3.57	1	7
Ability	4.13	4.66	4.49	1	7
Work hours	4.29	4.52	4.44	1	7
Variety	4.31	4.92	4.72	1	7

**Table 2: summary statistics of variables used in model estimations**

Variable (characteristics)	(%) Proportion	Minimum	Maximum	Mean
<i>Grade</i>				
Associate specialists	19.7			
Staff grade	56.3			
Others	24			
<i>Gender</i>				
Female	67.94			
Male	32.06			
<i>Location</i>				
City	42.58			
Town & Remote	57.42			
<i>Ethnicity</i>				
White	76.27			
Non-white	23.73			
<i>Age</i>				
< 35 years	10.38	29	68	46
36 – 45 years	40.89			
46 – 55 years	35.17			
> 55 years	13.56			
<i>NHS income dummy</i>				
< £20,000 per annum	22.15			
£20,000 - £34,999 p.a.	43.86			
£35,000 +	33.99			
Comparison income		-0.55	0.25	-0.18
<i>Hospital size</i>				
Teaching hospital	19.92			
Non-teaching hospital	80.08			
<i>Specialty</i>				
General medicine	26.41			
General surgery	12.77			
Anaesthesia	9.09			
Paediatrics	15.80			
Lab medicine	5.4			
Psychiatry	12.99			

*For HESG Canterbury (9-11 July 2003). Work in progress – please do not quote*

<b>Obstetrics &amp; Gynaecology</b>	5.84		
<b>Radiology</b>	0.87		
<b>Oral medicine</b>	5.19		
<b>Accidents &amp; Emergencies</b>	5.63		
<i>Total number of sessions</i>			
<b>NHS sessions</b>		1	46
<b>University/academic sessions</b>		0	10
			8
			0.2
<i>Trained as a GP before?</i>			
<b>Yes</b>	40.26		
<b>No</b>	59.74		
<i>Consider consultant career?</i>			
<b>Yes</b>	35.42		
<b>No</b>	64.58		
<i>Work weekends?</i>			
<b>Yes</b>	38.58		
<b>No</b>	61.42		
<i>Non-NHS work?</i>			
<b>Yes</b>	11.14		
<b>No</b>	88.86		
<i>Health state</i>			
<b>Excellent health</b>	22.17		
<b>Non-excellent health</b>	77.83		
<i>Do you have a partner?</i>			
<b>Yes</b>	87.25		
<b>No</b>	12.75		
<i>Modified career for partner?</i>			
<b>Yes</b>	41.53		
<b>No</b>	58.47		
<i>Normally take meal breaks?</i>			
<b>Yes</b>	51.71		
<b>No</b>	48.29		
<i>Full annual leave entitlements?</i>			
<b>Yes</b>	74.47		
<b>No</b>	25.53		
<i>Distance to work (miles)</i>		0	70
			9.45
<i>Got a child?</i>			
<b>0 – 5 years</b>			
<b>At least one</b>	19.28		
<b>None</b>	80.72		
<b>5 – 12 years</b>			
<b>At least one</b>	40.04		
<b>None</b>	59.96		
<b>13 – 18 years</b>			
<b>At least one</b>	19.49		
<b>None</b>	80.51		
<b>18 +</b>			
<b>At least one</b>	19.07		
<b>None</b>			

**Table 3: regression results**

Variable (characteristics)	Physical	Freedom	Fellows	Recognition	Responsibility	Pay	Abilities	Work hours	Variety	Overall
<i>Domains of job satisfaction</i>										
<b>Physical</b>										0.22 (0.04)**
<b>Freedom</b>										0.23 (0.05)**
<b>Fellows</b>										0.34 (0.05)**
<b>Recognition</b>										0.15 (0.04)**
<b>Responsibility</b>										0.09 (0.05)*
<b>Pay</b>										0.20 (0.03)**
<b>Abilities</b>										0.13 (0.05)**
<b>Work hours</b>										0.13 (0.04)**
<b>Variety</b>										0.49 (0.05)**
<i>Grade<sup>o</sup></i>										
<b>Associate specialists</b>	-0.26 (0.14)*	0.21 (0.14)	0.20 (0.14)	0.11 (0.13)	0.18 (0.14)	0.52 (0.13)**	0.37 (0.14)**	0.13 (0.14)	-0.01 (0.14)	-0.45 (0.17)**
<b>Staff grade</b>	-0.45 (0.11)**	-0.05 (0.11)	0.003 (0.12)	-0.14 (0.11)	-0.17 (0.11)	0.002 (0.11)	0.02 (0.11)	-0.10 (0.11)	0.08 (0.11)	-0.31 (0.14)**
<i>Gender</i>										
<b>Male<sup>c</sup></b>	0.05 (0.10)	-0.10 (0.10)	-0.14 (0.10)	-0.06 (0.10)	-0.12 (0.10)	-0.21 (0.10)**	-0.26 (0.10)**	0.05 (0.10)	-0.32 (0.10)**	0.08 (0.12)
<i>Location</i>										
<b>City<sup>b</sup></b>	0.07 (0.10)	0.30 (0.10)**	0.26 (0.10)**	0.24 (0.10)**	0.16 (0.10)	0.19 (0.10)*	0.35 (0.10)**	0.17 (0.10)*	0.37 (0.10)**	-0.14 (0.12)
<i>Ethnicity</i>										
<b>White<sup>+</sup></b>	0.02 (0.12)	0.44 (0.11)**	0.41 (0.12)**	-0.10 (0.11)	0.15 (0.11)	0.11 (0.11)	0.08 (0.11)	-0.08 (0.11)	0.21 (0.11)*	-0.06 (0.14)
<i>Age<sup>f</sup></i>										
<b>36 – 45 years</b>	-0.03 (0.12)	0.09 (0.23)	0.37 (0.61)	0.11 (0.58)	0.09 (0.89)	0.003 (0.32)	-0.02 (0.91)	-0.002 (0.03)	-0.03 (0.02)	-0.05 (0.16)
<b>46 – 55 years</b>	-0.13 (0.05)**	-0.13 (0.05)**	-0.18 (0.06)**	-0.11 (0.05)**	-0.03 (0.05)	-0.12 (0.05)**	-0.06 (0.05)	0.08 (0.05)	-0.04 (0.05)	0.19 (0.18)
<b>&gt; 55 years</b>	0.001 (0.0006)**	0.001 (0.0006)**	0.002 (0.001)**	0.001 (0.0006)**	0.0002 (0.0006)	0.001 (0.0006)*	0.0005 (0.0006)	-0.001 (0.001)	0.0004 (0.001)	-0.34 (0.22)
<i>NHS income dummy<sup>o</sup></i>										
<b>£20,000 - £34,999 p.a.</b>	-0.07 (0.12)	-0.13 (0.12)	-0.05 (0.12)	-0.31 (0.12)**	0.03 (0.12)	-0.17 (0.12)	-0.002 (0.12)	-0.30 (0.12)	0.22 (0.12)*	0.18 (0.14)
<b>£35,000 + p.a.</b>	0.004 (0.14)	0.01 (0.14)	0.13 (0.14)	-0.22 (0.14)	0.15 (0.14)	0.10 (0.14)	0.30 (0.14)**	-0.28 (0.14)*	0.30 (0.14)**	0.28 (0.17)*
<i>Comparison income</i>	0.17 (0.3)	-0.40 (0.31)	-0.97 (0.32)**	0.12 (0.31)	0.08 (0.31)	0.33 (0.31)	-0.67 (0.31)**	-0.18 (0.31)	-0.82 (0.31)**	0.49 (0.38)
<i>Hospital size</i>										

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<b>Teaching hospital<sup>z</sup></b>	-0.05 (0.13)	-0.16 (0.13)	-0.13 (0.14)	-0.14 (0.13)	-0.03 (0.13)	-0.25 (0.13)*	-0.02 (0.13)	-0.23 (0.13)*	-0.05 (0.13)	0.39 (0.16)**
<i>Specialty*</i>										
<b>General surgery</b>	-0.01 (0.13)	0.01 (0.13)	-0.02 (0.13)	-0.18 (0.13)	0.12 (0.13)	0.08 (0.13)	0.05 (0.13)	-0.23 (0.13)*	0.16 (0.13)	-0.08 (0.15)
<b>Anaesthesia</b>	0.46 (0.15)**	0.90 (0.15)**	0.09 (0.15)	0.45 (0.15)**	0.46 (0.15)**	0.33 (0.15)**	0.31 (0.15)**	0.46 (0.16)**	0.48 (0.16)**	-0.30 (0.18)
<b>Paediatrics</b>	-0.27 (0.13)**	0.14 (0.13)	0.04 (0.13)	-0.38 (0.13)**	-0.06 (0.13)	0.10 (0.13)	-0.06 (0.13)	-0.18 (0.13)	0.09 (0.13)	0.14 (0.16)
<b>Lab medicine</b>	-0.09 (0.17)	0.58 (0.17)**	0.22 (0.17)	-0.51 (0.17)**	0.05 (0.17)	0.19 (0.17)	0.24 (0.17)	-0.06 (0.17)	-0.17 (0.17)	0.84 (0.20)**
<b>Psychiatry</b>	-0.02 (0.14)	0.55 (0.14)**	0.23 (0.14)*	0.21 (0.14)	0.59 (0.14)**	0.30 (0.14)**	0.47 (0.14)**	0.06 (0.14)	0.79 (0.14)**	-0.06 (0.17)
<b>Obstetrics &amp; Gynaecology</b>	-0.09 (0.18)	-0.10 (0.18)	-0.10 (0.18)	-0.03 (0.18)	-0.33 (0.18)*	-0.04 (0.18)	-0.10 (0.18)	0.54 (0.18)**	0.09 (0.18)	0.25 (0.22)
<b>Radiology</b>	0.31 (0.53)	0.46 (0.54)	-0.89 (0.54)	-0.14 (0.53)	0.04 (0.54)	0.09 (0.53)	-0.30 (0.54)	0.27 (0.54)	0.12 (0.54)	0.10 (0.60)
<b>Oral medicine</b>	0.13 (0.18)	-0.18 (0.18)	-0.93 (0.19)**	-0.91 (0.18)**	-0.88 (0.19)**	-0.47 (0.18)**	-0.60 (0.18)**	-0.33 (0.18)*	-0.35 (0.19)*	0.19 (0.22)
<b>Accidents &amp; Emergencies</b>	0.13 (0.18)	-0.14 (0.18)	-0.07 (0.19)	-0.10 (0.11)	0.003 (0.18)	-0.10 (0.18)	0.06 (0.18)	-0.01 (0.18)	0.54 (0.18)**	-0.47 (0.21)**
<i>Total number of sessions</i>										
<b>NHS sessions</b>	0.001 (0.01)	0.01 (0.01)	-0.0004 (0.01)	0.03 (0.01)**	0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)	0.002 (0.01)	0.01 (0.01)	-0.02 (0.02)
<b>University/academic sessions</b>	-0.03 (0.05)	-0.04 (0.05)	0.10 (0.05)**	0.05 (0.05)	0.02 (0.05)	-0.08 (0.05)	0.01 (0.05)	-0.007 (0.05)	0.14 (0.05)**	-0.07 (0.06)
<i>Trained as a GP before?</i>										
<b>Yes<sup>z</sup></b>	0.18 (0.08)**	0.22 (0.09)**	0.04 (0.09)	0.03 (0.08)	-0.04 (0.09)	-0.08 (0.08)	0.05 (0.09)	0.01 (0.09)	0.21 (0.09)**	0.41 (0.10)**
<i>Consider consultant career?</i>										
<b>Yes<sup>z</sup></b>	-0.10 (0.10)	-0.03 (0.10)	-0.19 (0.10)*	-0.31 (0.10)**	-0.26 (0.10)**	-0.22 (0.10)**	-0.30 (0.10)**	-0.20 (0.10)**	-0.004 (0.10)	0.07 (0.11)
<i>Work weekends?</i>										
<b>Yes<sup>z</sup></b>	0.07 (0.09)	0.15 (0.09)*	0.18 (0.09)**	0.10 (0.09)	0.06 (0.09)	0.05 (0.09)	0.13 (0.09)	-0.34 (0.09)**	0.16 (0.09)*	-0.17 (0.10)
<i>Non-NHS work?</i>										
<b>Yes<sup>z</sup></b>	-0.20 (0.13)	-0.10 (0.13)	-0.06 (0.13)	-0.01 (0.13)	-0.01 (0.13)	-0.15 (0.13)	-0.13 (0.13)	-0.41 (0.13)**	-0.30 (0.13)**	0.41 (0.15)**
<i>Health state</i>										
<b>Excellent health<sup>z</sup></b>	0.40 (0.09)**	0.23 (0.09)**	0.06 (0.10)	0.25 (0.09)**	0.21 (0.09)**	-0.02 (0.09)	0.12 (0.09)	0.31 (0.09)**	0.48 (0.09)**	0.39 (0.11)**
<i>Do you have a partner?</i>										
<b>Yes<sup>z</sup></b>	-0.06 (0.13)	0.14 (0.13)	0.28 (0.13)**	0.11 (0.13)	0.39 (0.13)**	0.03 (0.13)	0.19 (0.13)	0.04 (0.13)	0.42 (0.13)**	0.06 (0.15)
<i>Modified career for partner?</i>										
<b>Yes<sup>z</sup></b>	-0.10 (0.08)	-0.27 (0.08)**	-0.30 (0.09)**	0.02 (0.08)	-0.32 (0.08)**	-0.14 (0.08)*	-0.26 (0.08)**	-0.26 (0.08)**	-0.11 (0.08)	-0.02 (0.10)
<i>Normally take meal breaks?</i>										
<b>Yes<sup>z</sup></b>	0.25 (0.08)**	0.25 (0.08)**	0.26 (0.08)**	0.35 (0.08)**	0.15 (0.08)*	0.28 (0.08)**	0.26 (0.08)**	0.26 (0.08)**	0.17 (0.08)**	0.27 (0.10)**
<i>Full annual leave entitlements?</i>										

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<b>Yes<sup>z</sup></b>	0.09 (0.09)	-0.01 (0.09)	0.12 (0.09)	-0.04 (0.09)	-0.11 (0.09)	-0.26 (0.09)**	-0.06 (0.09)	-0.12 (0.09)	0.08 (0.09)	-0.36 (0.10)**
<i>Distance to work (miles)</i>	0.002 (0.004)	-0.001 (0.004)	-0.01 (0.003)*	0.004 (0.004)	-0.01 (0.004)*	0.0007 (0.004)	-0.01 (0.004)	-0.002 (0.004)	-0.001 (0.004)	-0.001 (0.004)
<i>Got a child?</i>										
<b>0 – 5 years</b>										
<b>At least one<sup>o</sup></b>	-0.32 (0.11)**	-0.08 (0.11)	-0.13 (0.11)	-0.29 (0.11)**	-0.17 (0.11)	-0.42 (0.11)**	-0.24 (0.11)**	0.14 (0.11)	-0.04 (0.11)	0.17 (0.13)
<b>5 – 12 years</b>										
<b>At least one<sup>o</sup></b>	0.23 (0.09)**	0.02 (0.09)	0.09 (0.09)	0.26 (0.09)**	0.18 (0.09)**	0.02 (0.09)	-0.001 (0.09)	-0.003 (0.09)	-0.11 (0.09)	-0.31 (0.11)**
<b>13 – 18 years</b>										
<b>At least one<sup>o</sup></b>	0.25 (0.11)**	0.26 (0.11)**	0.21 (0.11)*	0.10 (0.11)	0.14 (0.11)	0.26 (0.11)**	-0.004 (0.11)	0.10 (0.11)	0.35 (0.11)**	-0.27 (0.14)*
<b>18 +</b>										
<b>At least one<sup>o</sup></b>	0.17 (0.11)	0.10 (0.11)	-0.02 (0.11)	-0.08 (0.11)	-0.01 (0.11)	-0.17 (0.11)	0.11 (0.11)	-0.10 (0.11)	0.03 (0.11)	0.31 (0.13)**
<i>n</i>	836	844	835	845	847	840	846	840	843	787
<b>LR Chi<sup>2</sup> (prob.)</b>	137.32 (0.0)**	189.23 (0.0)**	176.91 (0.0)**	176.91 (0.0)**	150.52 (0.0)**	150.45 (0.0)**	160.61 (0.0)**	138.40 (0.0)**	192.02 (0.0)**	1062.96 (0.0)**
<b>Pseudo R<sup>2</sup></b>	0.05	0.06	0.07	0.05	0.05	0.05	0.06	0.05	0.07	0.43

\* = Significant at 10% level.; \*\* = Significant at 5% level.

<sup>o</sup> The base grade is made up of clinical assistants and other lower grades

<sup>z</sup> Relative to female

<sup>o</sup> Relative to town and remote areas

<sup>+</sup> Relative to non-white

<sup>+</sup> The base age is made up of those below 35 years of age

<sup>o</sup> The base income is made up of those earning less than £20,000 per annum

<sup>x</sup> Relative to non-teaching hospital

<sup>\*</sup> The base speciality is general medicine

<sup>o</sup> Relative to no

<sup>+</sup> Relative to non-excellent health

<sup>o</sup> Relative to none

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