Determinants of general practitioners' wages

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Summary

In this paper we analyse the determinants of wages earned by general practitioners (GPs) in England. Using a unique and rich dataset based on individual tax records for 21,657 GPs held at Her Majesty's Revenue and Customs, we regress GP wages on a comprehensive set of individual, practice and local area characteristics. Individual level factors affecting wages are gender and years of experience. Important practice characteristics are type of contract, list size, partnership size, and working in a dispensing practice. Important local area characteristics are the rate of limiting longstanding illness, the proportion of the population from ethnic minorities, population density, and the level of deprivation. An important determinant of GP wages is contractual status. We find that GPs employed on primary medical services (PMS) contracts earn on average around 25% higher wages than those employed on general medical services (GMS) contracts, and that PMS status explains over 35% of the explained inequality in GP wages. We decompose the observed log wage differential between PMS and GMS GPs into the portion due to differences in individual, practice and local area characteristics, the portion due to differences in the returns to these characteristics, and an interaction component. We find that 70% of the observed log wage differential is due to list size. The wage premium paid to PMS GPs is due partly to the fact that on average PMS GPs have longer lists, and mainly to the fact that on average the returns to list size are greater for PMS GPs.

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Introduction

While the pay levels of general practitioners (GPs) in England have been discussed widely in the media and academic literature in recent years very little is known about the determinants of GP wages. This is surprising given the importance of earnings in determining preferences for alternative jobs in general practice (Wordsworth et al., 2004).

There are various mechanisms by which GPs in England can influence their earnings. The majority of GPs are independent contractors who contract with the National Health Service (NHS) to provide general medical services to registered populations under a nationally negotiated set of terms and conditions (Williams et al, 2001). These GPs, employed on general medical services (GMS) contracts, typically form small partnerships and many elect to own their own premises. Until 2004, they were paid on the basis of a standard set of fees and allowances which were intended to deliver an average net income and reflect workload differences between practitioners. Payments were made on the basis of allowances, capitation fees, items of service and target payments, and reimbursed costs. Payments were also paid to compensate for the levels of deprivation and rurality of an area, and practice costs. The Review Body on Doctors and Dentists Remuneration determined the level of these payments. GPs could influence their income via the number of registered patients, items delivered under fee-for-service and achievement of target payments. Additionally, where there is no local pharmacy, especially in rural areas, practices can be designated as dispensing practices. This enables GPs to dispense drugs as well as prescribe them, and can provide additional income to the practice through a mark-up on the pharmaceutical products and fees for each item dispensed.

A new voluntary contractual option for Principals was introduced in pilot form in 1998, which freed GPs from the constraints of the standard GMS contract. Instead of being independent contractors GPs were able to propose local service contracts designed to meet the needs of the local populations. GPs could be employed on a salaried basis to provide personal medical services (PMS) alongside other services required locally. The aim of many of the PMS pilots was to "use salaried GP schemes to improve GP recruitment and retention, and to enhance the quality of service in under-served areas" (Williams et al., 2001, p.284).

PMS contracts are thought to have been more generously reimbursed than GMS contracts, particularly in deprived areas (Shapiro, 2000), though there is evidence that compared with standard GP contracts PMS contracts "tend to offer lower pay" (Williams et al., 2001, p.286). As noted by Lewis and Gillam (2002): "salaried general practitioners are … notably cheaper than the independent contractors; they seem willing to trade income for better working conditions, such as freedom from responsibilities out of hours and paid sickness and educational leave." (p.1127).

The aim of this paper is to analyse the determinants of wages earned by GPs in England. In our analysis we use a unique dataset on GP income and expenses derived from tax records held at Her Majesty's Revenue and Customs. Because our dataset has a rich set of variables that affect GP wages we are able to examine a number of questions relevant to the organisation of general practice in England. Specifically:

- Is there evidence of wage discrimination against certain demographic groups of GPs (e.g., female GPs and non-British GPs)?
- Are there financial returns to GPs for working in larger practices?
- Are there compensating wage differentials (i.e., higher wages) for working in certain areas (e.g., deprived areas)?
- Do GPs with different contracts (GMS, PMS) earn different wages?

Our analysis has three components. First, we derive an estimate of GP hourly wages and regress this against a comprehensive set of individual, practice and local area characteristics. This allows us to identify the key determinants of GP wage and address some of the questions raised above. Second, we use a regression-based approach to identify the contribution of these characteristics to inequality in log wages. Our analyses show that PMS contractual status is an important factor explaining GP wage levels and GP wage inequality. The third component of our analysis therefore examines the impact of contractual status in more detail and we decompose the observed log wage differential between PMS and GMS GPs into the portion due to differences in variables or characteristics, the portion due to differences in coefficients or returns to characteristics, and an interaction component. This allows us to better explain why PMS GPs earn higher wages than GMS GPs.

Data

Our main source of data is tax information on GP annual income and expenses for the financial year 1st April 2002 to 31st March 2003 collected by Her Majesty's Revenue and Customs (HMRC, formerly the Inland Revenue). The data were collated as part of the Inland Revenue Enquiry, which is an annual survey of GP earnings and expenses commissioned by the Technical Steering Committee (TSC) in the Health and Social Care Information Centre. GP tax records were linked with a dataset provided by the TSC that contained individual, practice and local area data sourced from the General Medical Statistics database for September 2002 and area characteristics attributed to practices based on the geographical locations of their registered populations. Access to the data was granted by HMRC at the request of the NHS Confederation. The dataset was held by HMRC and was analysed in their offices. The researchers were not allowed to take away the data or any results that would have identified individual GPs. Also, the researchers are unable to return to the dataset, meaning that further interrogations of the data are not possible.

Data on GP hours were taken from the 2004 General Practitioner Worklife Survey, which was conducted by the National Primary Care Research and Development Centre at the University of Manchester in February 2004. A questionnaire was mailed to 4,208 GPs in England, of which 2,261 (54%) responded. The questionnaire includes various items relating to personal, practice and job characteristics, job satisfaction and intentions to quit, and it includes questions on hours worked per week.

Wages

We compute GP wages using data on annual net income from the HMRC dataset. This is calculated as total gross Schedule D income from all sources plus professional income not included in the profits of the practice minus total allowable expenses.

While the tax records held at HMRC provide a comprehensive, reliable and unique source of data on GP annual earnings and expenses a limitation is that they do not contain data on hours worked. Total income would be expected to increase with hours worked and of more interest are hourly earnings or wages.

We use the 2004 General Practitioner Worklife Survey to predict GP hours in the HMRC dataset. We regress hours worked per week on a range of socio-demographic, practice and area characteristics. The set of covariates that best explain the variation in GP hours is identified using a backwards stepwise regression procedure, which removes variables that do not contribute to the explanation of hours worked. The resulting set of variables are then identified in the HMRC dataset and used to predict GP hours of work.

We then calculate GP wages by dividing annual net income by the predicted hours worked per annum. The latter are estimated as the number of weeks worked per annum (assumed to be 47 weeks) multiplied by the predicted hours worked per week.

Determinants of GP wages

Having computed GP wages we then analyse the determinants of these by regressing wages against a range of individual, practice and local area characteristics in the HMRC dataset. We estimate the following regression model by least squares across all GPs:

$$y_i = x_i\beta + e_i \qquad [1]$$

y_i is the wage earned by GP *i*, *x* is a vector of covariates thought to influence wages, β is a vector of coefficients, and *e* is an error term. We estimate and report robust standard errors.

The covariates are:

(1) Individual characteristics. We include variables that measure gender, experience, part time status, and country of qualification.

(2) Practice characteristics. We include in this category variables that measure whether the GP works in a PMS practice, list size, partnership size, and whether the practice is designated a dispensing practice.

(3) Local area characteristics. We include variables that measure the local standardised rate of limiting long term illness, the proportion of the local population from an ethnic minority, the local population density, and local area deprivation. We also include indicators for the type of area in which the practice is located.

Determinants of inequality in GP wages

In addition to investigating the determinants of GP wage levels we also investigate the determinants of GP wage inequality. We quantify the percentage of inequality in GP wages that is attributable to different factors by calculating the contribution of each covariate to the explained variance in wages in wage regression models. The analysis is based on model [1]. More specifically, *x* is a vector of covariates $X_1, X_2, ...X_K$ thought to influence GP wages, and there are *k* = 1, 2, … *K* variables included in *x*. β is a vector of coefficients β_1, β_2,…β_K pertaining to each variable *k*. Using [1] it is possible to estimate the impact of each variable X_k, including PMS status, on GP wage inequality. The approach is based on a methodology proposed initially by Shorrocks (1982) to decompose income inequality into the effect of each source of income where for every individual the sum of the income derived from each source equals their total income (see Jenkins, 1995, for a further discussion). Shorrocks' approach applies readily to regression analysis on the basis that $\hat{y}_i = \sum_{k=1}^{K} X_{ik}\hat{\beta}_k$, a fact noted and operationalised by Fields (2002) in his regression-based approach to decomposing income inequality. The method proposed by Fields involves first running [1]. The relative contribution s_k of each factor X_k to inequality, which Fields labels the "factor inequality weight", is:

$$s_k = \frac{\hat{\beta}_k \sigma_{X_k} \mathrm{corr}(X_{ik}, y_i)}{\sigma_y} = \frac{\mathrm{cov}(X_{ik}\hat{\beta}_k, y_i)}{\sigma_y^2} \qquad [2]$$

s_k may take any value between –1 and +1. If factor X_k and wages *y* are uncorrelated their covariance is zero and the factor inequality weight for X_k will be zero. In this case the inequality in *y* is unrelated to X_k. If X_k and *y* are negatively correlated their covariance is negative and s_k will be negative, and vice versa. The stronger the relationship between X_k and *y* the larger the value of s_k. The variance of a variable is the covariance of that variable with itself. This means that if X_k is perfectly correlated with *y* then $\mathrm{cov}(X_{ik}\hat{\beta}_k, y_i) = \sigma_y^2$. In this case inequality in *y* is explained perfectly by X_k and s_k =1.

A convenient feature of this approach, as derived by Fields (2002), is that the sum of the effects of the X_k's is equal to the variation in the dependent variable explained by the regression model:

$$\sum_{k=1}^{K} s_k = \sum_{k=1}^{K} \frac{\text{cov}(X_{ik}\beta_{ik}, y_i)}{\sigma_y^2} = R^2 \qquad [3]$$

Shorrocks (1982) has shown that under certain assumptions the above method can be used to decompose any inequality index that satisfies certain conditions, including "the Gini coefficient, the Atkinson index, the generalized entropy family, the coefficient of variation, and various centile measures." (Fields, 2002).

Results

The HMRC dataset contains data for 22,222 GPs in England. There are missing values for some of the local area characteristics supplied by TSC and the final estimation sample size was 21,657.

The model used to predict GP hours is in Table 1. The coefficients from the analysis of weekly hours worked in the 2004 General Practitioner Worklife Survey are all statistically significant and plausibly signed, and the model passes the RESET. Summary statistics on the values of the covariates are also presented for both the Worklife Survey and the HMRC dataset. Except for the smaller proportion of salaried GPs in the Worklife Survey, the sample characteristics are similar in both datasets. The actual and predicted hours worked per week are also reported. The mean values in the two datasets are similar, with a larger standard deviation in the Worklife Survey because these actual observations of hours worked include the idiosyncratic error terms.

In the HMRC dataset the mean annual total gross Schedule D income of GP from all sources plus professional income not included in profits of the practice was £188,379 (Std. Dev. = £87,860). Mean total allowable expenses were £114,683 (Std. Dev. = £66,503). Mean net income was £73,696 (Std. Dev. = 29,451) and mean wages, computed using the predicted hours variable, were £35.00 (Std. Dev. = £12.05).

Variable means and definitions for the variables in the wage model are in Table 2. The results from the wage model are in Table 3. PMS GPs earn significantly higher wages than GMS GPs, with a wage premium of £8.62, which is 25% higher than the mean wage earned by GMS GPs. Female GPs earn significantly lower wages than male GPs. Consistent with economic theory, the relationship between experience and wages is inverse U-shaped, with a maximum turning point occurring at 27 years after qualifying. Those working in a job share earned lower wages than full-timers, but the effect is not significant. Part-timers had higher wages, but the effect is weakly significant. Country of qualification has no significant effect on wages. List size has a significant and positive effect on wages, as does partnership size. The implication of the latter is that conditional on the other covariates, single handed GPs have lower wages than those in larger practices. GPs working in practices designated as dispensing practices have significantly higher wages than other GPs. In terms of the local area characteristics, all else equal the limiting long term illness rate has a significant and negative effect on wages and higher proportions of the population from minority ethnic groups are positively associated with wages. Population density has a significant and negative effect and deprivation is positively correlated with wages. Conditional on the other covariates the results suggest little impact of area type on wages, all else equal.

The determinants of GP wage inequality are also presented in Table 3. Note that the sum of the factor inequality weights is equal to the proportion of variation in wages explained by the regression model. The most important factor explaining inequality in GP wages is working in a PMS practice, which explains 7.9% of observed wage inequality and 36.1% of the explained wage variation. Other important factors in the explained variation are list size (30.5%), working in a practice with dispensing status (13.8%), and experience (25.5% – 15.8% = 9.7%).

Decomposing wage differentials between PMS and GMS GPs

The results in Table 3 show that GPs working in PMS practices have higher wages than those working in GMS practices all else equal and that the effect is highly significant. In addition PMS status is the single most important factor contributing to the explained wage variation among GPs. We explore in more detail the reasons for the wage premium to working in a PMS practice by decomposing the mean log wage differential between PMS and GMS GPs. The underlying model is Mincer's (1974) log wage function, and based on Oaxaca's (1973)

model we decompose the mean log wage differential. We first run separate log wage equations on GPs working in the two types of practice

$$\log y_i^j = x_i^j \beta_i^j + \varepsilon_i^j \qquad [4]$$

y, x and β are defined as before, except in this case x does not include a covariate for whether the practice has PMS status. ε is an error term. Superscript j indexes practice type ($j = 1$ for PMS and $j = 2$ for GMS). [4] is estimated by least squares and the estimated fit passes through the sample mean (i.e., $\overline{\log y}_i^j = \bar{x}_i^j \hat{\beta}_i^j$ for $j = 1,2$). Following Daymont and Andrisani (1984), the raw log wage differential D can be expressed as:

$$D = \overline{\log y}^1 - \overline{\log y}^2 = \left(\bar{x}^1 - \bar{x}^2\right)\hat{\beta}^2 + \bar{x}^2\left(\hat{\beta}^1 - \hat{\beta}^2\right) + \left(\bar{x}^1 - \bar{x}^2\right)\left(\hat{\beta}^1 - \hat{\beta}^2\right) \qquad [5]$$

D is decomposed into three parts. The first term on the right hand side of [5] is V, which is the differential attributable to the differences in variables or observed characteristics between the two types of practice. This represents differences in wages measured in terms of differences in individual, practice and local area characteristics. The second term is C, which is the differential attributable to the differences in the coefficients in the two models, including the constant term. This measures differences in wages across the two groups of GPs that are attributable to the differential impact of x; i.e., it captures the differences in the 'returns' to the characteristics of each group. The third term I is the portion of the raw differential in log wages that arises due to the interaction between the coefficients and the variables. A positive sign indicates that the impact of variables for PMS GPs (GMS GPs) is greater for those variables for which PMS GPs (GMS GPs) have higher mean values.

V, C and I may be used to determine the explained component of the observed earnings differential (E) and an unexplained component (U), which arises from the differential impact of the characteristics across the two types of practice. V is part of E, and C is part of U. The question is how to allocate I between U and E. The answer depends on what we believe the appropriate impact of the variables on earnings should be (i.e., what are the correct returns/coefficients to the covariates x). [5] can be generalized to

$$D = \overline{\log y}^1 - \overline{\log y}^2 = \left(\bar{x}^1 - \bar{x}^2\right)\left[w\hat{\beta}^1 + (1-w)\hat{\beta}^2\right] + \left[\bar{x}^1(1-w) + \bar{x}^2 w\right]\left(\hat{\beta}^1 - \hat{\beta}^2\right) \qquad [6]$$

w is a weight used to reflect which set of coefficients (those for $j = 1,2$ or a combination) are 'correct'. Oaxaca (1973) proposes two alternatives assuming either that the returns for PMS GPs ($j = 1$) or GMS GPs ($j = 2$) are correct. In the first case w=1 since in decomposing the differential that would then exist the coefficients for PMS GPs are used to weight the

differences in variables. Conversely, if it is assumed that the returns for GMS GPs are more appropriate then w=0. Blinder (1973) suggests that w=1 is to be preferred since the obtained differential is more easily interpretable. If w=0 then $E = V$ and $U = C + I$. If w=1 then $E = V + I$ and $U = C + I$. Reimers (1983) suggests a weighting of w=0.5, i.e., to use the equal-weighted average of the coefficients for the two groups to weight the differences in variables. Cotton (1988) proposes weighting the coefficients by the number of observations in the two groups, i.e., $w = n^1/(n^1 + n^2)$, where n^j is the number of individuals in each group. Neumark (1988) suggests that the appropriate returns need not necessarily be those of either group or some combination of the two. Instead he constructed the following generalized decomposition:

$$D = \overline{\log y}^1 - \overline{\log y}^2 = (\bar{x}^1 - \bar{x}^2)\beta^* + \left[\bar{x}^1(\hat{\beta}^1 - \beta^*) + \bar{x}^2(\beta^* - \hat{\beta}^2)\right] \qquad [7]$$

where β^* is a vector of 'correct' returns. The first term on the right hand side of [7] can be interpreted as the part of the differential due to differences in the variables or observed characteristics across the two groups weighted by the appropriate returns and is the explained part of the observed differential, E. The second term is the unexplained component, U. If, for example, the returns to PMS GPs are deemed to be correct (i.e., $\beta^* = \hat{\beta}^1$) then [7] reduces to the special case in [6] where w=1. Similarly, if $\beta^* = \hat{\beta}^2$ then w=0. Neumark (1988) suggests that β^* could be obtained from the coefficients in a model given by $\log y_i = x_i\beta_i + \varepsilon_i$, which is run on the pooled data.

The log wage models used in the decomposition are in Table 4. There are no PMS practices designated as dispensing practices in the data, and there are no GMS practices with more than 13 partners. The main differences between the models for PMS and GMS GPs is that in the PMS model gender has no significant effect on log wages, while female GMS GPs earn significantly lower wages than their male counterparts. Compared with PMS GPs who work full time those working on a job share or part-time basis have no significant wage penalty, while for GMS GPs the effects are significant and negative. Area type has little effect on wages for PMS GPs, while for GMS GPs relative to "London Centre" those working in "London Cosmopolitan" and "Prospering UK" areas have significantly lower and higher wages, respectively.

The summary results of the decompositions are presented in the top panel of Table 5. The mean log wages for PMS GPs ($\overline{\log y}^1$) and GMS GPs ($\overline{\log y}^2$) are 3.644 and 3.457, respectively. The observed log wage differential is 0.188. This is comprised of a negative differential due to variables (*V*), and a positive differential due to coefficients (*C*). The interaction term (*I*) is also positive, but is much smaller than *C*. The implication of these findings is that the higher observed wages of PMS GPs in the sample is explained by their superior returns to individual, practice and local area characteristics.

The top panel in Table 5 also presents the magnitude of the explained and unexplained components of the raw differential depending on how the interaction *I* is allocated between *E* and *U*. In all cases the unexplained component (*U*) is positive and relatively large and the explained component (*E)* is relatively small and either positive or negative depending on the value of *w*. The positive unexplained effect means that the average PMS GP would earn lower wages if they received the same returns to the covariates as GMS GPs. Put another way, a GP working in a PMS practice with identical mean characteristics to a GP working in a GMS practice would earn higher wages than the GMS GP.

In the bottom panel in Table 5 we present a more disaggregated set of results for the decomposition analysis to determine the contribution of each covariate to the overall values of *V*, *C* and *I*. We also report the sum of these, which gives the overall contribution of each covariate to the observed log wage differential. This allows us to see which factors exert the biggest effect on the observed wage differential. Experience and list size have the largest positive effects. With respect to experience, one of the main reasons why a PMS GP with the same mean characteristics as a GMS GP would earn higher wages is due to the higher returns to years of experience for PMS GPs. With respect to the effect of list size note that on average PMS GPs have longer lists, which partly explains their higher wages under *V*. More importantly in terms of explaining the observed log wage differential, there are also higher returns to longer lists for PMS GPs under *C*. The implication is that if a PMS GP and a GMS GP have the same list size then, controlling for the other covariates, the PMS GP would earn higher wages. Overall, list size accounts for around 70% (i.e., 0.128/0.188) of the observed log wage differential between PMS and GMS GPs.

Concluding remarks

In the first part of this study we analysed the determinants of GPs' wages in England. Individual level factors affecting wage levels were gender and years of experience. Important practice characteristics were working in a PMS practice, list size, partnership size, and working in a practice designated as a dispensing practice. Important local area characteristics are the rate of limiting longstanding illness, the proportion of the population from ethnic minorities, and population density. In terms of the questions posed at the outset, we found evidence of wage discrimination against female GPs employed on GMS contracts, who earn significantly lower wages than males all else equal. We found no evidence of an impact of country of qualification on wages. In terms of practice size, we found that after controlling for other covariates, particularly list size, partnership size is positively correlated with wages. This is possibly because expenses per GP are lower in larger practices due to economies of scale. In terms of local area effects, we found evidence of higher wages among GPs working in more deprived areas and those with more ethnic minorities. Wages are negatively correlated with local area illness and population density.

We also found that contractual status is an important determinant of GP wages, and we then considered in more detail the wage differential between GMS and PMS GPs. GMS GPs who contract their services to the NHS exert much more control over their income than PMS GPs and bear the financial risks for their independent status. PMS GPs on the other hand are guaranteed an income stream from their local primary care organisation, which means that more of the financial risks of their contract are borne by the employer. We might therefore expect PMS GPs to earn lower wages than GMS GPs. This seems to have been borne out by early research (e.g., Williams et al., 2001, Lewis and Gillam, 2002).

Contrary to the above view we found that PMS GPs in our dataset in fact earn around 25% higher wages than GMS GPs. One plausible explanation this wage premium is that underpinning PMS contracts is the incentive for GPs to work in under-served areas. The effect of this is seen in our decomposition analysis. In particular we find that list size is the most important factor accounting for the observed log wage differential between PMS GPs and GMS GPs. This is relevant in two respects. First, PMS GPs tend to have longer lists than other GPs. This is likely to be associated with working in the under-served areas that PMS

contracts were meant to target. Second, we found that the returns to list size were greater for GPs with PMS status. This suggests that there is a wage premium to PMS GPs for taking longer lists that is not available to GMS GPs. An alternative explanation for the wage premium to PMS contracts is self-selection of high wage-earning GPs into the PMS group. For example, ex-GP fundholders may be more likely to choose PMS contracts.

There are limitations to our study. First, the HMRC does not hold data on hours worked by GPs. We were therefore required to use predicted hours based on data from the 2004 General Practitioner Worklife Survey. We note that the proportion of salaried GPs in the Worklife Survey is much lower than in the HMRC data, which may mean that the model used to predict hours was not estimated on a commensurate sample. Second, we were unable to find reliable evidence on the number of weeks worked per annum by GPs, which is required to compute our wage variable. We therefore assumed a figure of 47 weeks for all GPs. If, for example, PMS GPs work a significantly different number of weeks per annum than GMS GPs then our results may over or underestimate the returns to PMS. Third, the HMRC total income data are based on Schedule D (self employed) income. GMS GPs declare all their income under Schedule D. Under PMS there is an option to be declared employed or self-employed. Hence, PMS GPs may elect to declare their income under Schedule E (employed), but there are financial incentives to using Schedule D due to the tax advantages it entails with respect to the deductions for expenses incurred. The implication is that mean wages earned by PMS GPs in our sample may overestimate the actual mean. Fourth, our analysis is based on HMRC data for the financial year 2002/3. This means that the recent changes to the GMS contract are not included in the wage data. Nonetheless, our results also provide a baseline to assess the distributional impact of these changes to the remuneration of GPs in England.

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Table 1. Model used to predict GP hours.

	2004 General Practitioner Worklife Survey (N = 1,825)				HMRC dataset (N = 22,222)	
	Regression model		Summary statistics		Summary statistics	
	Coef.	t	Mean	Std.Dev.	Mean	Std.Dev.
Female	-6.872	-11.15	0.340	0.474	0.336	0.472
Full time	13.523	19.03	0.795	0.404	0.804	0.397
Average list size per GP / 1,000	2.686	3.47	1.648	0.685	1.851	0.495
(Average list size per GP / 1,000) squared	-0.177	-3.19	3.187	7.280	3.672	2.460
Dispensing	1.474	2.48	0.185	0.389	0.146	0.353
10% of GPs with most deprived patients	-1.957	-1.75	0.069	0.254	0.088	0.284
Salaried	-2.130	-1.7	0.025	0.157	0.206	0.404
Practice list size / 1,000	-0.214	-3.7	8.962	4.524	8.337	4.200
Constant	34.091	27.39				
N	1,825					
R^2	0.370					
RESET F (p)	0.840 (0.473)					
Hours worked per week			44.520*	12.910*	44.790**	4.200**

* Actual

** Predicted

Table 2. Variable means and definitions in wage models.

Variable	Mean	Definition
Wage	35.00	Hourly wages
PMS practice	0.207	PMS practice = 1, 0 otherwise
Female	0.334	Female = 1, 0 otherwise
Experience	2.235	Years since qualified/10
Experience squared	5.658	Years since qualified squared/100
Full time	0.804	Full-time contract = 1, 0 otherwise
Job share	0.016	Job share contract = 1, 0 otherwise
Part time	0.181	Part-time contract = 1, 0 otherwise
Qualified: UK	0.831	Qualified in UK = 1, 0 otherwise
Qualified: non-UK Europe	0.016	Qualified in Europe outside UK = 1, 0 otherwise
Qualified: rest of world	0.153	Qualified outside Europe = 1, 0 otherwise
List size	1.856	Mean patients per partner in practice/1000
Partnership size: 1	0.083	1 partner in practice = 1, 0 otherwise
Partnership size: 2	0.107	2 partners in practice = 1, 0 otherwise
Partnership size: 3	0.131	3 partners in practice = 1, 0 otherwise
Partnership size: 4	0.168	4 partners in practice = 1, 0 otherwise
Partnership size: 5	0.167	5 partners in practice = 1, 0 otherwise
Partnership size: 6	0.139	6 partners in practice = 1, 0 otherwise
Partnership size: 7	0.094	7 partners in practice = 1, 0 otherwise
Partnership size: 8	0.061	8 partners in practice = 1, 0 otherwise
Partnership size: 9	0.026	9 partners in practice = 1, 0 otherwise
Partnership size: 10	0.011	10 partners in practice = 1, 0 otherwise
Partnership size: 11	0.006	11 partners in practice = 1, 0 otherwise
Partnership size: 12	0.002	12 partners in practice = 1, 0 otherwise
Partnership size: 13	0.003	13 partners in practice = 1, 0 otherwise
Partnership size: 14	0.001	14 partners in practice = 1, 0 otherwise
Partnership size: 15	0.001	15 partners in practice = 1, 0 otherwise
Partnership size: 16	0.001	16 partners in practice = 1, 0 otherwise
Dispensing practice	0.146	Dispensing practice = 1, 0 otherwise
Limiting long term illness rate	0.985	Standardised rate of limiting longstanding illness
Ethnic minorities	0.082	Proportion of practice population from non-white ethnic groups
Population density	28.091	Persons per hectare
IMD score	23.917	Index of multiple deprivation 2000 score
“Cities and Services”	0.241	ONS area: “Cities and Services” = 1, 0 otherwise
“Coastal and Countryside”	0.088	ONS area: “Coastal and Countryside” = 1, 0 otherwise
“London Centre”	0.023	ONS area: “London Centre” = 1, 0 otherwise
“London Cosmopolitan”	0.029	ONS area: “London Cosmopolitan” = 1, 0 otherwise
“London Suburbs”	0.051	ONS area: “London Suburbs” = 1, 0 otherwise
“Mining and Manufacturing”	0.150	ONS area: “Mining and Manufacturing” = 1, 0 otherwise
“Prospering UK”	0.419	ONS area: “Prospering UK” = 1, 0 otherwise
Predicted hours	44.790	Predicted hours worked per week

Table 3. Determinants of wages and inequality in wages.

	Wages		Factor inequality weights	
	Coef.	t	s_k	$100 * s_k / R^2$
PMS practice	8.618	38.73	0.07899	36.1
Female	-0.743	-4.11	0.00222	1.0
Experience	8.708	19.06	0.05556	25.5
Experience squared	-1.586	-15.89	-0.03435	-15.8
Job share	-0.668	-0.96	0.00027	0.1
Part time	0.440	1.77	-0.00091	-0.4
Qualified: non-UK Europe*	-0.772	-1.38	0.00022	0.1
Qualified: rest of world*	-0.356	-1.33	-0.00007	0.0
List size	6.893	24.45	0.06680	30.5
Partnership size: 2**	3.393	7.27	-0.00008	0.0
Partnership size: 3**	4.118	9.18	-0.00239	-1.1
Partnership size: 4**	4.638	10.50	-0.00298	-1.4
Partnership size: 5**	5.169	11.47	0.00143	0.7
Partnership size: 6**	5.489	12.05	-0.00002	0.0
Partnership size: 7**	5.447	11.50	-0.00080	-0.4
Partnership size: 8**	5.522	10.84	0.00075	0.3
Partnership size: 9**	7.120	11.90	0.00323	1.5
Partnership size: 10**	5.052	6.86	0.00013	0.1
Partnership size: 11**	7.467	8.75	0.00085	0.4
Partnership size: 12**	3.072	3.00	0.00014	0.1
Partnership size: 13**	7.931	4.13	0.00122	0.6
Partnership size: 14**	8.372	4.50	0.00041	0.2
Partnership size: 15**	3.033	1.68	0.00011	0.0
Partnership size: 16**	22.199	15.79	0.00250	1.1
Dispensing practice	7.420	30.24	0.03005	13.8
Limiting long term illness rate	-3.128	-4.75	0.00256	1.2
Ethnic minorities	8.739	7.72	0.00404	1.9
Population density	-0.014	-2.28	0.00066	0.3
IMD score	0.030	4.18	-0.00119	-0.5
"Cities and Services"***	-0.371	-0.53	-0.00004	0.0
"Coastal and Countryside"***	0.426	0.53	-0.00029	-0.1
"London Cosmopolitan"***	0.342	0.44	0.00034	0.2
"London Suburbs"***	-0.407	-0.55	-0.00005	0.0
"Mining and Manufacturing"***	-0.038	-0.05	-0.00010	0.0
"Prospering UK"***	0.459	0.61	0.00145	0.7
Constant	5.644	4.38		
N	21,657			
R^2	0.2179			
Sum			0.2179	100.0

* The baseline category is "Qualified: UK". ** The omitted category is "Partnership size: 1". *** The omitted category is "London Centre".

Table 4. Log wage models used in the decomposition analysis.

	PMS				GMS				Pooled	
	Coef.	t	Mean	Pred.	Coef.	t	Mean	Pred.	Coef.	t
Female	-0.022	-1.37	0.32	-0.007	-0.022	-3.96	0.338	-0.008	-0.026	-4.55
Experience	0.365	8.59	2.243	0.819	0.292	19.85	2.233	0.652	0.321	21.51
Experience squared	-0.067	-7.40	5.664	-0.379	-0.054	-16.88	5.655	-0.303	-0.060	-18.57
Job share	-0.014	-0.27	0.017	0.000	-0.057	-2.91	0.015	-0.001	-0.037	-1.91
Part time	0.014	0.69	0.174	0.002	-0.016	-2.18	0.178	-0.003	-0.003	-0.44
Qualified: non-UK Europe*	-0.025	-0.47	0.015	0.000	-0.018	-0.95	0.016	0.000	-0.026	-1.37
Qualified: rest of world*	-0.004	-0.20	0.176	-0.001	-0.010	-1.27	0.147	-0.002	-0.006	-0.81
List size	0.248	18.82	1.911	0.474	0.188	30.96	1.84	0.346	0.215	37.63
Partnership size: 2**	0.185	6.13	0.106	0.02	0.106	9.17	0.107	0.011	0.123	10.73
Partnership size: 3**	0.249	7.91	0.111	0.028	0.155	13.38	0.135	0.021	0.169	14.54
Partnership size: 4**	0.242	7.78	0.149	0.036	0.188	16.30	0.173	0.032	0.197	17.11
Partnership size: 5**	0.310	10.15	0.172	0.053	0.196	16.67	0.166	0.033	0.221	19.03
Partnership size: 6**	0.333	10.32	0.129	0.043	0.214	17.70	0.143	0.031	0.233	19.36
Partnership size: 7**	0.320	9.06	0.087	0.028	0.216	16.74	0.096	0.021	0.233	18.06
Partnership size: 8**	0.336	9.04	0.072	0.024	0.218	15.11	0.058	0.013	0.248	17.36
Partnership size: 9**	0.411	9.14	0.034	0.014	0.238	12.82	0.024	0.006	0.288	15.96
Partnership size: 10**	0.318	4.76	0.011	0.004	0.207	8.19	0.011	0.002	0.231	9.18
Partnership size: 11**	0.474	6.33	0.009	0.004	0.264	7.94	0.006	0.001	0.326	10.28
Partnership size: 12**	0.274	1.93	0.002	0.001	0.171	3.17	0.002	0.000	0.217	4.06
Partnership size: 13**	0.442	5.52	0.008	0.003	0.149	2.34	0.001	0.000	0.362	7.73
Partnership size: 14**	0.408	4.08	0.005	0.002	##				0.463	6.04
Partnership size: 15**	0.251	2.83	0.006	0.002	##				0.334	4.93
Partnership size: 16**	0.663	5.35	0.003	0.002	##				0.742	7.65
Dispensing practice	#				0.213	30.26	0.184	0.039	0.159	21.15
Limiting long term illness rate	-0.113	-2.06	1.025	-0.116	-0.052	-2.39	0.975	-0.05	-0.055	-2.59
Ethnic minorities	0.271	3.47	0.093	0.025	0.252	7.43	0.079	0.02	0.224	6.96
Population density	0.000	-0.94	29.949	-0.013	0.000	-0.37	27.236	-0.002	-0.001	-2.78
IMD score	0.001	1.78	26.385	0.028	0.001	2.32	23.246	0.013	0.001	2.90
"Cities and Services"***	-0.035	-0.53	0.269	-0.009	0.033	1.57	0.233	0.008	0.011	0.50
"Coastal and Countryside"***	0.047	0.65	0.078	0.004	0.034	1.41	0.091	0.003	0.024	0.99
"London Cosmopolitan"***	0.106	1.65	0.046	0.005	-0.061	-2.74	0.024	-0.001	0.028	1.26
"London Suburbs"***	0.034	0.51	0.066	0.002	-0.022	-1.00	0.047	-0.001	0.003	0.15
"Mining and Manufacturing"***	0.009	0.12	0.213	0.002	0.030	1.28	0.132	0.004	0.024	1.02
"Prospering UK"***	0.035	0.51	0.314	0.011	0.040	1.78	0.448	0.018	0.019	0.84
Constant	2.509	24.76	1.000	2.509	2.526	68.60	1.000	2.526	2.523	69.02
Sum				3.644				3.457		
N	4,474				17,183				21,657	
R^2	0.1326				0.1581				0.1336	

* The baseline category is "Qualified: UK". ** The omitted category is "Partnership size: 1". *** The omitted category is "London Centre". # There are no PMS practices designated as dispensing practices in the data. ## There are no GMS practices with more than 13 partners in the data.

Table 5. Results of the decomposition analysis.

Summary results							
D	0.188		*w*=0	*w*=1	*w*=0.5	*w*=0.207*	Pooled**
V	-0.028	*E*	-0.028	0.017	-0.005	-0.018	0.002
C	0.170	*U*	0.215	0.170	0.193	0.206	0.186
I	0.045						

Detailed results	*V*	*C*	*I*	Sum
Female	0.000	0.000	0.000	0.000
Experience	0.003	0.163	0.001	0.167
Experience squared	-0.001	-0.076	0.000	-0.077
Job share	0.000	0.001	0.000	0.001
Part time	0.000	0.005	0.000	0.005
Qualified: non-UK Europe	0.000	0.000	0.000	0.000
Qualified: rest of world	0.000	0.001	0.000	0.001
List size	0.013	0.111	0.004	0.128
Partnership size: 2	0.000	0.009	0.000	0.009
Partnership size: 3	-0.004	0.013	-0.002	0.007
Partnership size: 4	-0.004	0.009	-0.001	0.004
Partnership size: 5	0.001	0.019	0.001	0.021
Partnership size: 6	-0.003	0.017	-0.002	0.012
Partnership size: 7	-0.002	0.01	-0.001	0.007
Partnership size: 8	0.003	0.007	0.002	0.012
Partnership size: 9	0.002	0.004	0.002	0.008
Partnership size: 10	0.000	0.001	0.000	0.001
Partnership size: 11	0.001	0.001	0.001	0.003
Partnership size: 12	0.000	0.000	0.000	0.000
Partnership size: 13	0.001	0.000	0.002	0.003
Partnership size: 14	0.000	0.000	0.002	0.002
Partnership size: 15	0.000	0.000	0.002	0.002
Partnership size: 16	0.000	0.000	0.002	0.002
Dispensing practice	-0.039	-0.039	0.039	-0.039
Limiting long term illness rate	-0.003	-0.06	-0.003	-0.066
Ethnic minorities	0.004	0.002	0.000	0.006
Population density	0.000	-0.01	-0.001	-0.011
IMD score	0.002	0.012	0.002	0.016
“Cities and Services”	0.001	-0.016	-0.002	-0.017
“Coastal and Countryside”	0.000	0.001	0.000	0.001
“London Cosmopolitan”	-0.001	0.004	0.004	0.007
“London Suburbs”	0.000	0.003	0.001	0.004
“Mining and Manufacturing”	0.002	-0.003	-0.002	-0.003
“Prospering UK”	-0.005	-0.002	0.001	-0.006
Constant	0.000	-0.017	0.000	-0.017
Sum	-0.028	0.170	0.045	0.188

Numbers may not add due to rounding error. * *w* = frequency weight for PMS GPs = (number of PMS GPs in the sample)/(number of PMS GPs plus GMS GPs in the sample). ** The appropriate returns are based on the pooled log wage model in Table 4.