Influences of practice characteristics on prescribing in fundholding and non-fundholding general practices: an observational study

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Abstract

Objective—To investigate the variation in prescribing among general practices by examining the contribution to this variation of fundholding, training status, partnership status, and the level of deprivation in the practice population and to investigate the extent to which fundholding has been responsible for any changes in prescribing.

Design—Analysis of prescribing data (PACT) for the years 1990-1 (before fundholding) and 1993-4 (after fundholding). Use of multiple linear regressions to investigate the variation among practices in total prescribing costs (net ingredient cost per prescribing unit), prescribing volume (items per 1000 prescribing units), and mean cost per item in each of the two years and also the change in these variables between years.

Setting—Former Mersey region.

Subjects—384 practices.

Results—The models developed explained the variation in cost per item (43% of variation explained for 1990-1, 38% for 1993-4) and prescribing volume (34% for 1990-1, 38% for 1993-4) better than the variation in total prescribing costs (3% for 1990-1, 7% for 1993-4). The models developed to explain the change in these variables between years did not explain more than 10% of the variation. Most of the explained variation in the change in total prescribing costs was accounted for by fundholding. Of the £3.71 saved by first wave fundholders compared with non-fundholders £3.57 was attributable to fundholding alone.

Conclusion—In neither year did fundholding make a major contribution to the variation in prescribing behaviour among practices, which was better explained by deprivation, training status, and partnership status, but it did seem largely responsible for differences in the rise of total prescribing costs between fundholders and non-fundholders.

Introduction

General practice fundholders contain prescribing costs more effectively than non-fundholders and have lower costs and a lower prescribing volume over the initial fundholding period,¹⁻³ although this may not be maintained.⁴⁻⁵ In 1994 a minister of health stated to the parliamentary health committee that in 1992-3 "GP fundholders spent £57, non-fundholders spent £61 per patient...not only do fundholders have lower spend per head but these costs are rising less quickly than those of non-fundholders."⁶ Similar sentiments were expressed recently by the current minister.⁷

But how much of these differences is attributable to fundholding itself and how much to other factors in the practice? Fundholders tend to differ in the nature of their practice and the patients they serve,⁸ which may

allow them less expensive prescribing and easier containment of costs. Demographics,⁹⁻¹⁰ deprivation,¹¹ employment levels,¹² and morbidity¹⁰ are important influences on variations in prescribing costs at the level of health authorities. Research at practice level has focused largely on practice demographics as the basis for the possible allocation of prescribing budgets.¹³⁻¹⁵ With one exception,¹⁶ research has not generally considered other factors which contribute to variation in prescribing at practice level, such as true morbidity, variation in doctors' perception of and response to diagnoses,¹⁷ socioeconomic factors, historical prescribing patterns, and patient expectations.

Our aim was to investigate the influence of deprivation, training, and partnership or fundholder status on variation in prescribing among practices and to investigate whether changes in prescribing after fundholding were attributable to fundholding alone or to these other factors. Observational studies of a population of practices combined with the use of multiple regression techniques are the most practical way to address these questions, since matching fundholding and non-fundholding practices for all of the possible confounders would be impossible.⁸

Methods

DATA AND STUDY POPULATION

The study primarily examined three general measures of prescribing (the dependent variables): total prescribing costs (net ingredient cost per prescribing unit; a prescribing unit is a crude measure intended to allow for increased drug use by the elderly: a patient aged under 65 counts as 1 unit, a patient aged 65 and over is 3), volume (items prescribed per 1000 prescribing units), and the average cost per item (net ingredient cost per item). Data about each measure were collected from PACTLINE for the years 1990-1 (as baseline before fundholding) and 1993-4 (after fundholding), as previously described,³ from 412 practices in the former Mersey region. We also examined the change in the dependent variables between 1990-1 and 1993-4.

Four main explanatory variables were investigated: (a) whether a practice became fundholding during the study period, and the wave of fundholding, (b) whether the practice was a training practice (defined as having a general practice registrar at any time during the period of the study), (c) partnership status (multipartner or singlehanded in 1990-4), and (d) the level of deprivation in the practice population. To illustrate the relative importance of these factors compared with historical prescribing, we also used an additional explanatory variable for 1993-4: the value of each prescribing measure in the year 1990-1.

Details of the first three explanatory variables were obtained from health authority data. As a measure of deprivation at practice level, we used the low income scheme index (LISI(C)92).¹¹ This index is based on the

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BMJ 1996;313:595-9

Table 1—Distribution of practice characteristics. Values are numbers (and percentages)

	Fundholding				Training		Partners	
	First wave (n = 18)	Second wave (n = 27)	Third wave (n = 48)	Non-fundholders (n = 291)	Training	Non-training	Multi-partner	Single-handed
Training								
Training (n = 62)	13 (21)	7 (11)	11 (18)	31 (50)				
Non-training (n = 322)	5 (2)	20 (6)	37 (12)	260 (81)				
Partners								
Multipartner (n = 301)	18 (6)	24 (8)	40 (13)	219 (73)	60 (20)	241 (80)		
Singlehanded (n = 83)	0 (0)	3 (4)	8 (10)	72 (87)	2 (2)	81 (98)		
Deprivation								
LISI(C)92 quartile 1 (0, 8.9) (n = 98)	12 (12)	8 (8)	16 (16)	62 (63)	31 (32)	67 (68)	83 (85)	15 (15)
LISI(C)92 quartile 2 (9, 16.3) (n = 95)	4 (4)	9 (10)	12 (13)	71 (74)	11 (12)	84 (88)	81 (85)	14 (15)
LISI(C)92 quartile 3 (16.4, 23.9) (n = 97)	1 (1)	7 (7)	9 (9)	80 (83)	11 (11)	86 (87)	74 (76)	23 (24)
LISI(C)92 quartile 4 (24, 59.6) (n = 94)	1 (1)	3 (3)	11 (12)	79 (84)	9 (9)	85 (90)	63 (67)	31 (33)

percentage of items dispensed that were exempt from prescription charges under the low income scheme in 1992; more deprived practice populations are associated with higher scores. LISI(C)92 scores were available for 94% of practices in the former Mersey region.

Practices which started or ceased during the study period or for which a LISI(C)92 score was unavailable were excluded. The final study population was 384 practices, roughly 85% of the practices in the region in March 1994.

ANALYSIS

The median and interquartile range for the primary dependent variables were calculated for each quartile of the LISI(C)92 index and for each level of the other explanatory variables for both the first period (1990-1, before fundholding) and the last (1993-4, after fundholding). The differences between the years were also calculated. Data for intervening periods were also examined but added no new information and so are not given here.

Stepwise multiple linear regressions, using SPSS, examined the relations between dependent and explanatory variables. The natural logarithms of all the dependent variables except for the changes between years were used to normalise the residuals. In analysing the changes between years arithmetic differences were used. First order interactions of the explanatory variables were also examined. A significance level of 0.05 was used for both inclusion and exclusion of variables in the analysis.

Results

DISTRIBUTION OF PRACTICE CHARACTERISTICS.

Early waves of fundholders had proportionately more training practices, fewer singlehanded practices, and

lower LISI(C)92 scores than later waves or non-fundholders. Similarly, training practices were more likely to have multiple partners and lower LISI(C)92 scores than non-training practices. Singlehanded practices tended to have higher LISI(C)92 scores (table 1).

TOTAL PRESCRIBING COSTS (NET INGREDIENT COST PER PRESCRIBING UNIT)

Median total prescribing costs increased over the study period (table 2). The median cost was lower for first wave fundholders than for other groups, for which costs were broadly similar. Training practices had a lower median cost than non-training practices for both years. Costs for single and multipartner practices were similar. Costs for practices in the lowest quartile of the LISI(C)92 scores were lower than for other practices for both years.

In 1990-1 only 3% of the variation in prescribing costs could be explained by our explanatory variables (table 3). The models that explained most variation included fundholding wave alone or training status alone. There was no difference between the fit of the two models. None of the other explanatory variables contributed significantly to either model. For 1993-4 only 7% of the variation in prescribing costs could be explained by any model based on the four main explanatory variables (table 3). With the inclusion of prescribing costs for 1990-91 as an additional explanatory variable, the percentage of variation explained increased to 67% (not shown).

The median differences in prescribing costs between 1990-1 and 1993-4 (table 2) increased with increasing LISI(C)92 score and with wave of fundholding. Only 10% of the variation in these differences was explained by any model based on the four main explanatory variables (table 3).

Table 2—Median and interquartile range for total prescribing costs (net ingredient cost (£) per prescribing unit) for all explanatory variables in both years and for the difference between years

Practice type	No of practices	Median (interquartile range) cost (£)		
		1990-1 (before fundholding)	1993-4 (after fundholding)	Difference between years
First wave fundholder	18	34.46 (31.22-37.60)	44.97 (43.54-48.69)	10.89 (9.92-13.67)
Second wave fundholder	27	38.02 (34.61-41.84)	51.45 (47.26-55.08)	12.41 (10.42-14.21)
Third wave fundholder	48	38.05 (34.94-40.39)	52.83 (49.49-55.15)	14.83 (11.28-17.60)
Non-fundholder	291	39.25 (34.70-43.62)	54.44 (48.85-60.59)	15.08 (11.84-18.14)
Training	62	36.09 (33.37-39.77)	49.23 (45.96-55.48)	13.68 (11.20-16.49)
Non-training	322	39.40 (34.86-43.37)	54.26 (49.43-59.35)	14.69 (11.14-17.81)
Multiple	301	38.53 (34.69-42.20)	53.82 (48.38-58.77)	14.79 (11.81-17.81)
Singlehanded	83	39.61 (33.43-45.65)	53.75 (47.56-58.34)	13.16 (9.98-17.40)
LISI(C)92 quartile 1 (0, 8.9)	98	36.72 (33.26-40.47)	49.94 (45.30-54.92)	12.79 (10.79-16.00)
LISI(C)92 quartile 2 (9, 16.3)	95	39.57 (35.66-43.53)	54.05 (49.76-59.17)	14.06 (11.03-17.34)
LISI(C)92 quartile 3 (16.4, 23.9)	97	39.61 (35.06-43.76)	54.93 (49.44-59.90)	15.15 (11.16-17.70)
LISI(C)92 quartile 4 (24, 59.6)	94	39.32 (36.65-44.08)	55.78 (49.89-62.08)	16.90 (12.64-19.65)

Table 3—Regression equation for model explaining variation in total prescribing costs (net ingredient cost per prescribing unit)

	1990-1 (log _e) (before fundholding)			1993-4 (log _e) (after fundholding)			Arithmetic difference between years		
	r ² = 0.025			r ² = 0.067			r ² = 0.095		
	Coefficient	SE	P	Coefficient	SE	P	Coefficient	SE	P
Constant	3.591	0.023		3.965	0.017		14.09	0.59	
First wave fundholders v non-fundholders				-0.145	0.039	0.002	-3.57	1.34	0.008
Second wave fundholders v non-fundholders				-0.071	0.032	0.026	-3.30	1.09	0.003
Third wave fundholders v non-fundholders				-0.032	0.025	0.192	-0.39	0.85	0.645
Single-handed v multiple partners							-2.87	0.69	<0.001
Non-training v training	0.078	0.025	0.001						
LISI(C)92				0.002	0.001	0.045	0.093	0.027	0.001

The mean difference in prescribing costs between fundholders and non-fundholders and its implications are calculated for first wave fundholders in the box.

PREScribing VOLUME (ITEMS PER 1000 PRESCRIBING UNIT)

The median prescribing volume increased over the study period (table 4). In 1990-1 fundholders had a lower median volume than non-fundholders; early wave fundholders had a lower volume than later waves. A similar pattern was seen in 1993-4. Median volumes were lower in training and multipartner practices, while they increased with increasing LISI(C)92 score.

Thirty four per cent of the variation in prescribing volume in 1990-1 could be explained (table 5). The best model included the LISI(C)92 score, the training status of the practice, and the partnership status of the practice. For 1993-4 these same variables explained 38% of the variation (table 5). With the inclusion of the prescribing volume for 1990-1 as an additional explanatory variable the percentage of variation explained increased to 85% (not shown). Fundholding status did not contribute significantly to these models.

The largest increases in median volume between 1990-1 and 1993-4 were seen in third wave fundholders, training practices, and multipartner practices. The differences increased with increasing

LISI(C)92 score (table 4). No simple model with any of our explanatory variables could explain the variation in these changes.

COST PER ITEM (NET INGREDIENT COST PER ITEM)

The median cost per item rose during the study period (table 6). In 1990-1 the median cost per item was higher in first and second wave fundholders than in third wave fundholders or non-fundholders. In 1993-4, however, there was little difference between any wave of fundholders or between fundholders and non-fundholders. Cost per item decreased with increasing LISI(C)92 score in both years and was higher in training or multipartner practices.

In 1990-1, 43% of the variation in the cost per item was explained (table 7). The best model included partnership status, LISI(C)92 score, and an interaction between partnership status and fundholding wave. In 1993-4 38% of the variation in cost per item was explained by a model including partnership status and LISI(C)92 score. Inclusion of cost per item data from 1990-1 as an additional explanatory variable increased the variation explained to 75% (not shown).

The median difference in cost per item between 1990-1 and 1993-4 was lower for first wave fundholders and singlehanded practices. The difference decreased with increases in LISI(C)92 score (table 6). Only 6% of

Table 4—Median and interquartile range for prescribing volume (items per 1000 prescribing units) for all explanatory variables in both years and for the difference between years

Practice type	No of practices	Median (interquartile range)		
		1990-1 (before fundholding)	1993-4 (after fundholding)	Difference between years
First wave fundholder	18	5806 (4764-6428)	6608 (5639-7099)	705 (607-1042)
Second wave fundholder	27	6442 (5490-7430)	7439 (6344-7804)	749 (265-1020)
Third wave fundholder	48	7073 (5936-7956)	7844 (6746-8769)	885 (405-1190)
Non-fundholder	291	7376 (6287-8355)	8223 (7038-9427)	850 (469-1338)
Training	62	6078 (5395-7066)	7017 (6176-7931)	891 (625-1215)
Non-training	322	7414 (6345-8347)	8250 (7005-9430)	817 (385-1305)
Multiple	301	6894 (5983-7890)	7748 (6658-8845)	825 (472-1216)
Singlehanded	83	8096 (7205-9166)	8992 (7876-10197)	763 (249-1436)
LISI (C)92 quartile 1 (0, 8.9)	98	6000 (5222-6787)	6706 (5991-7546)	705 (300-1008)
LISI(C)92 quartile 2 (9, 16.3)	95	6826 (6119-7713)	7734 (6687-8702)	746 (457-1148)
LISI(C)92 quartile 3 (16.4, 23.9)	97	7567 (6734-8448)	8420 (7485-9349)	881 (469-1269)
LISI(C)92 quartile 4 (24, 59.6)	94	8060 (7309-9126)	9374 (8456-10145)	1165 (494-1561)

Table 5—Regression equation for model explaining variation in prescribing volume (items per 1000 prescribing units)

	1990-1 (log _e) (before fundholding)			1993-4 (log _e) (after fundholding)		
	r ² = 0.343			r ² = 0.382		
	Coefficient	SE	P	Coefficient	SE	P
Constant	8.582	0.026		8.707	0.021	
Singlehanded v multiple partners	0.114	0.024	<0.001	0.083	0.022	<0.001
Non-training v training	0.112	0.027	<0.001	0.079	0.024	0.001
LISI(C)92	0.009	0.001	<0.001	0.011	0.001	<0.001

Table 6—Median and interquartile range for cost per item (net ingredient cost (£) per items) for all explanatory variables in both years and for the difference between years

Practice type	No of practices	Median (interquartile range) cost (£)		
		1990-1 (before fundholding)	1993-4 (after fundholding)	Difference between years
First wave fundholder	18	5.85 (5.71-6.79)	6.91 (6.61-7.86)	1.04 (0.87-1.21)
Second wave fundholder	27	5.86 (5.06-6.42)	7.07 (6.19-7.48)	1.19 (0.69-1.40)
Third wave fundholder	48	5.48 (4.94-6.33)	6.87 (6.25-7.54)	1.23 (0.98-1.49)
Non-fundholder	291	5.47 (4.96-6.02)	6.78 (6.01-7.43)	1.26 (0.91-1.58)
Training	62	5.91 (5.45-6.60)	7.18 (6.64-7.94)	1.24 (0.93-1.49)
Non-training	322	5.46 (4.92-5.46)	6.75 (5.91-7.40)	1.21 (0.91-1.58)
Multiple	301	5.66 (5.13-6.17)	6.98 (6.41-7.58)	1.26 (0.97-1.59)
Singlehanded	83	4.91 (4.45-5.47)	5.90 (5.37-6.81)	1.03 (0.68-1.43)
LISI(C)92 quartile 1 (0, 8.9)	98	6.12 (5.62-6.82)	7.55 (6.82-8.27)	1.28 (1.00-1.58)
LISI(C)92 quartile 2 (9, 16.3)	95	5.73 (5.31-6.21)	7.06 (6.47-7.66)	1.36 (0.92-1.63)
LISI(C)92 quartile 3 (16.4, 23.9)	97	5.36 (4.91-5.87)	6.66 (5.93-7.27)	1.17 (0.88-1.45)
LISI(C)92 quartile 4 (24, 59.6)	94	4.89 (4.34-5.27)	6.03 (5.34-6.72)	1.14 (0.81-1.53)

the variation in the difference could be explained by a model which included fundholding status, partnership status, and LISI(C)92 score (table 7).

Discussion

VARIATIONS AMONG PRACTICES

The models described above explain the variations in cost per item and prescribing volume better than they explain the variation in total prescribing costs. Adding historical prescribing to the models greatly increased the amount of variation explained for 1993-4. "Historical prescribing" covers a multitude of factors which we have been unable to disentangle in this study, such as morbidity or perceived morbidity, factors pertaining to doctors and their readiness to prescribe, and patient expectations.

These findings do not support the suggestion that fundholders are less expensive prescribers simply because they have become fundholders.⁶ Even before fundholding, future fundholders, particularly future first wave fundholders, tended to have lower total prescribing costs and volumes than non-fundholders but a higher cost per item. A similar pattern was seen in training practices compared with non-training practices, in less deprived practices compared to more deprived practices, and, except for similar total prescribing costs, in multipartner practices compared with singlehanded practices.

There are clear links between these factors: fundholding practices tended to be multipartner practices, were more likely to be training practices, and were more likely to have low LISI(C)92 scores. Criteria for becoming fundholders included practice size (11 000 for the first wave, but since relaxed) and a high degree of organisation (also a requirement for training). Such practices may possibly be more in control of prescribing, but are also more likely to be in affluent areas.⁸ Conversely, non-fundholding practices were less likely

to be training practices and more likely to be singlehanded than fundholders. They also often had higher LISI(C)92 scores and tended to be concentrated in less affluent areas.¹⁸

The pattern of high cost per item and low volume (and often lower total prescribing costs) is seen in practices with more affluent patients. This may be explained by these patients, who tend to be liable for prescription charges, buying relatively inexpensive but widely used drugs such as paracetamol over the counter. Less affluent patients, who may be exempt from prescription charges because of low income, might seek prescriptions for such drugs. Some of the difference in rates of prescribing will also be explained by higher morbidity in more deprived areas,¹⁹ but it is impossible in this study to separate deprivation and morbidity.

Such a pattern is also found between health authorities. For example, in 1994 relatively affluent Oxford had a prescribing cost/patient/year of £58.37; items/patient/year of 7.2; cost/item of £8.06, and the sixth lowest LISI(C)92 score of the 90 family health service authorities in England, whereas the more deprived St Helens in Mersey had a prescribing cost/patient/year of £81.21, items/patient/year of 12.4, cost/item of £6.55, and the fourth highest LISI(C)92 score.^{11 20}

VARIATION OVER TIME

Changes in prescribing volume between the years were not well explained by any of the variables studied. Changes in cost per item were explained to a very limited extent by factors including fundholding, deprivation, and partnership status.

Changes in total prescribing costs before and after fundholding were partly explained by models including fundholding wave, partnership status, and deprivation. Although our model explained only a small amount of the variation, fundholding was the major contributor to the model, with fundholding alone accounting for

Table 7—Regression equation for model explaining variation in cost per item (net ingredient cost per item)

	1990-1 (log _e) (before fundholding)			1993-4 (log _e) (after fundholding)			Arithmetic difference between years		
	r ² = 0.425			r ² = 0.384			r ² = 0.061		
	Coefficient	SE	P	Coefficient	SE	P	Coefficient	SE	P
Constant	1.878	0.0150		2.083	0.014		1.53	0.07	
First wave fundholders v non-fundholders	0.025	0.033	0.449				-0.40	0.15	0.008
Second wave fundholders v non-fundholders	0.024	0.029	0.405				-0.23	0.12	0.063
Third wave fundholders v non-fundholders	0.011	0.023	0.607				-0.08	0.10	0.385
Singlehanded v multiple partners	-0.078	0.018	<0.001	-0.107	0.018	<0.001	-0.23	0.08	0.004
LISI(C)92	-0.009	0.001	<0.001	-0.009	0.001	<0.001	-0.01	0.00	0.006
Singlehanded/first wave fundholders									
Single handed/second wave fundholders	0.031	0.084	0.713						
Single handed/third wave fundholders	-0.155	0.055	0.005						

£3.57 of the £3.71 difference in increase in total prescribing costs between first wave fundholders and non-fundholders (see box). A similar pattern can be shown for second and third wave fundholders but is less marked because of their shorter time as fundholders up to 1993-4. Therefore at present it seems reasonable to attribute differences in the rate of rise of the drug bill between fundholders and non-fundholders to fundholding itself. Although fundholding is not yet making a significant contribution to differences in overall prescribing costs between practices, this may occur in the future unless non-fundholders become as successful as fundholders in restraining cost increases.⁴ A limitation of this study is that we looked at only four easily available practice characteristics to try to explain the variation in prescribing. Many other variables could have been considered, such as dispensing status or personal characteristics of general practitioners, and have been studied at both authority¹⁰ and practice level.¹⁶ Obviously such factors are not mutually exclusive. Other limitations to this study include the measures studied³: for instance, the LISI(C)92 index has not been validated at the practice level,^{21 22} although it correlates well with other measures of deprivation at health authority level.¹¹ Similarly, the item is a poor measure of true prescribing volume²³ and may further confuse effects of deprivation, since doctors may prescribe more drug in a single item to patients known to pay prescription charges (hence producing higher cost, lower volume prescribing). Furthermore, we have not considered important changes within specific therapeutic areas which may influence clinical outcomes.²⁴

How much influence has fundholding itself on changes in total prescribing costs?

Total prescribing costs are taken on net ingredient cost per prescribing unit (NIC/PU)

The regression equation derived in table 3 is:

Predicted mean change in NIC/PU between 1990-1 and 1993-4 = 14.09 – 3.57 (fundholding wave 1) – 3.30 (fundholding wave 2) – 0.39 (fundholding wave 3) – 2.87 (partnership status: 0 for multipartner, 1 for singlehanded) + 0.09LISI(C)92.

Thus, for example, a first wave fundholding practice is predicted to have increased its NIC/PU by £3.57 less than a similar non-fundholding practice—that is, one with the same LISI(C)92 and partnership status.

To calculate the mean predicted change for fundholders, for example, in the first wave we can use this equation substituting the proportion of singlehanded fundholders (none in wave 1) for partnership status and the mean LISI(C)92 score (9.07 for first wave fundholders).

Thus for first wave fundholders:

Predicted mean change in NIC/PU =
14.09 – 3.57(1) – 3.30(0) – 0.39(0) – 2.87(0) + 0.09(9.07) = £11.34
(equation a)

that is, first wave fundholders are predicted by this model to increase their NIC/PU by £11.34.

The equation for non-fundholders, whose proportion of singlehanded practices is 0.25 and whose mean LISI(C)92 is 18.65, is:

Predicted mean change in NIC/PU =
14.09 – 3.57(0) – 3.30(0) – 0.39(0) – 2.87(0.25) + 0.09(18.65) = £15.05
(equation b)

that is, non-fundholders are predicted to increase their NIC/PU by £15.05.

We are interested in the relative increase of first wave fundholders compared with non-fundholders.

Subtracting equation (b) from (a) gives the predicted mean change in NIC/PU of first wave fundholders compared with non-fundholders:

= (14.09 – 14.09) – 3.57(1 – 0) – 3.30(0 – 0) – 0.39(0 – 0) – 2.87(0 – 0.25) + 0.09(9.07 – 18.65)
(equation c)
= 0 – 3.57 + 0.72 – 0.86 = – 3.71

that is, first wave fundholders are predicted to save £3.71 per prescribing unit compared with non-fundholders, and fundholding is the major contributor to this, accounting for £3.57 of the predicted £3.71. The impact of LISI(C)92 and partnership status largely cancel each other out.

Key messages

- Fundholding does not contribute to any great extent to the current variation in prescribing behaviour between practices, which is better explained by deprivation, training status and partnership status.
- Much of the variation in prescribing practice remains unexplained.
- Fundholding is the major contributor to the differences in the rise in prescribing costs between fundholders and non-fundholders.

Nevertheless, our conclusion is that ministerial suggestions that the less expensive prescribing of fundholders is due to their fundholding status are incorrect at present, but the claim that fundholding has affected the rate of rise of prescribing costs is supported by our data.

We thank the participating fundholding practices, and medical and pharmaceutical advisers in the family health services authorities of Mersey region for their cooperation and the Prescribing Research Unit, University of Leeds, for providing LISI(C)92 data.

Funding: North West Regional Health Authority.

Conflict of interest: None.

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(Accepted 18 July 1996)