General Practice Observed

Variations in GP night visiting rates: medical organisation and consumer demand

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Summary

Specially obtained data for night visiting fees show a considerable increase in the number of claims made per general practitioner and per 1000 patients. There were also considerable variations between the 116 executive councils: in 1973-4 the range was from 3·8 to 17·0 per 1000 patients. To explain these variations, their relation with the local characteristics of family practice and of the population was explored using regression analysis. The factors most strongly associated with variations in implied visiting rates were found to be deputising services and the proportion of social class V in the population.

Introduction

Over the past two decades several studies of night visiting have been carried out in various practice settings. These indicate a wide range of visiting rates as between different family practitioners. The reported annual rates for visits from 2300 to 0700 range from 7·8[1] to 30·0[2] per 1000 patients. None of these studies was, however, based on a representative sample of practices. Moreover, no inquiry has attempted to deal with the national picture as a whole. Indeed, during the greater part of the National Health Service's history, no such study could have been carried out without a special data-collecting exercise. But data tend to follow money, and since the introduction of night-visit payments in April 1967 at least some of the information needed for such a study has become available. We have therefore used the data for all executive councils in England (excluding only the Scilly Isles) to relate geographical variations in implied night-visiting rates to the characteristics of both service providers and patient population.

National picture

Since 1967 the amount paid out in night-visit fees has increased more than thirteenfold (table I). In part, this reflects the increase in the fee per visit: this has gone up from £1 to £4·60—and so has doubled in real terms. More interesting, however, has been the growth in the number of visits claimed for: nationally, the implied visiting rate per principal rose from 10·7 in 1967-8 to 24·0 in 1975-6, while that per 1000 patients went up from 4·3 to 10·1. These figures have been calaculated on the basis of dividing total payments made by the fee applicable at the relevant time, and adjusting both for a time-lag between date of visit and payment, and for the extension, in 1972, of the hours during which a visit earned an entitlement to a fee. The sources and methods used in calculating these data and the methodology of the subsequent analyses may be obtained on request from the authors.[3]

TABLE I—*Night-visit fee payments: England*

Year	Total night-visit fee payment (thousands)	Fee		Implied night-visiting rates a year ¶	
		Actual amount	Value at 1970 prices ‡	Per principal	Per 1000 patients
1967–8*	£157·7	£1·00	£1·18	10·7§	4·3§
1968–9	£185·5	↓	£1·12	11·3	4·5
1969–70	£199·5	↓	£1·06	12·1	4·8
1970–1	£463·7	£2·50	£2·49	12·2§	4·9§
1971–2	£585·4	↓	£2·25	13·8	5·6
1972–3†	£922·4	£3·00	£2·55	17·0§	7·0§
1973–4	£1242·2	↓	£2·32	20·7	8·6
1974–5	£1366·8	↓	£2·00	22·5	9·5
1975–6	£2064·3	£4·60	£2·42	24·0‖	10·1‖

* Figures for 1967–8 are for England *and* Wales.

† In August 1972 "eligible" hours increased from 2400-0700 to 2300-0700 (see ¶).

‡ Deflated using the General Index of Retail Prices for 2nd quarter (July-September) of each financial year; average for 1970 = 100. (Source: *Economic Trends*).

§ There is a time-lag between date of service, which governs rate of fee, and date of payment. Hence in the first year payments relate to less than a full year of visits, and in years in which fees were increased relate to payments made at two rates. Figures have been adjusted as necessary in line with probable length of delay.

‖ Proportion of payments at old and new rate known for 1975-6.

¶ To make the rates for the period before August 1972 comparable, they have been adjusted upwards on a "pro-rata" basis to allow for visits made between 2300 and 2400.

Interpreting the upward trend in implied visiting rates requires caution. On the available evidence it is impossible to distinguish between the effects of a growing propensity to claim the fees and a growing propensity to visit. Our figures may therefore simply indicate that, given pressures on incomes, GPs have been claiming for more of the visits made; or they could be showing an increase in the actual number of visits made by GPs and their deputies.

The problem of disentangling these two explanations is compounded by the possibility that their relative significance may have changed over time. An increasing propensity to claim may well explain most of the rise in the years immediately after the introduction of the fees in 1967-8. But the subsequent, and continuing, rise in the 'seventies could represent an increase in actual visiting rates. If it is assumed that there has been no real increase over the whole period but that by 1975-6 all fees were being claimed for this would imply that GPs were claiming only 51% of the fees to which they were entitled as late as 1970-1—three years after the introduction of the system. Alternatively, if it were assumed that even in 1975-6 only 80% of the fees were being claimed then this would imply a take-up rate of 41% in 1970-1.

If doctors are really as reluctant to claim their entitlements as these

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illustrative calculations would imply then it is surprising that the profession has been so insistent in calling for the introduction of fees. Alternatively, if the actual visiting rate has gone up then this could suggest that fees may have an incentive effect, although they represent less than 1% of the gross income of the average GP.[4]

Geographical variations

Within this national picture there are predictably wide geographical variations. To examine these in detail, 1973-4 was chosen. This is the latest year when it is possible to check validity across time, since the post-1974 family practitioner committees do not have the same boundaries as the executive councils that they have replaced.

From data specially obtained from the Department of Health and Social Security it was possible to calculate the implied visiting rates per 1000 patients in each executive council area. Since many executive council areas were both large and heterogenous it would ideally have been desirable to obtain data either for individual practices or much smaller population groups. But doing so would have made it impossible to examine the relation between visiting rates and community characteristics.

To check that 1973-4 was not atypical, the night visiting rates of 116 executive councils for that year were compared with those of the two previous years. The analysis showed a reassuring degree of consistency. Comparing the rates for 1973-4 with those for 1972-3, the correlation coefficient was 0·90; comparing 1972-3 with 1971-2, the coefficient was 0·86. The evidence suggests that any findings based on an analysis of 1973-4 will have more general applicability.

In 1973-4 the mean implied night-visiting rate of all executive councils was 8·86 per 1000 registered patients. At one extreme was Tynemouth, whose visiting rate of 17·0 per 1000 was 92% above the mean; at the other extreme Northampton had a rate of 3·8 per 1000, which was 57% below the mean (table II). Examining the top 10 executive councils might suggest, intuitively, that high visiting rates are characteristic of northern industrial cities. But there does not appear to be such a self-evidently common factor among the bottom 10. Moreover, it may be more important to explain the variations within the remaining 96 executive councils, where the rates ranged from 6·2 to 12·9.

TABLE II—*Executive councils with lowest and highest night visiting rates 1973-4*

Ranking	Executive council	Implied number of night visits per 1000 patients: Absolute No	Variation from national mean (%)
1	Tynemouth	17·0	92
2	Salford	15·5	75
3	Manchester	14·7	66
4	Gateshead	14·3	61
5	Rochdale	13·8	56
6	Newcastle upon Tyne	13·6	53
7	St Helens	13·3	50
8	Leicester	13·1	48
9	Wigan	13·1	48
10	Coventry	13·0	47
Average of "top 10"		14·1	60
National mean		8·86	
Average of "bottom 10"		5·1	−42
107	Warrington	6·1	−31
108	Hertfordshire	6·0	−32
109	York	5·8	−35
110	Reading	5·7	−36
111	Southport	5·5	−38
112	Burton-upon-Trent	5·2	−41
113	Bath	4·5	−49
114	Ipswich	4·3	−51
115	Chester	4·3	−51
116	Northampton	3·8	−57

In trying to interpret these variations, there is again the problem of distinguishing between the propensity to claim and the propensity to visit. But given the scale of the variations between executive councils it seems reasonable to assume that there must be other factors besides a geographically differential propensity to claim. There is, after all, no a priori ground for expecting a geographical bias in the propensity to claim; and even accepting that there are wide differences in the attitude of individual practitioners to claiming fees, it would be surprising if these differences would survive once averaged out among all GPs in any one executive council—and thus explain, for example, the four-fold difference between Tynemouth and Northampton. The next stage on the analysis therefore consisted of relating statistically the implied visiting rates to specific factors that were known or were expected to have a geographical bias.

Analysing variations

What factors might explain the geographical variations? On the one hand, visiting rates are influenced by the characteristics of the producers of medical care (supply factors): variations might reflect differences in the organisation of family practice. On the other hand, they may be influenced by the characteristics of the consumers of medical care (demand factors): variations might reflect differences in the characteristics of the population being served. For each executive council, accordingly, the following data[3] were obtained:

Supply factors—Average list size; the percentage of GPs in singlehanded practices; the percentage in partnerships of four or more; the percentages of GPs under 40 and over 55; the percentage of GPs authorised to use a deputising service; and population density.

Demand factors—The percentages of the population aged 65 to 75, aged 75 and above, and under 5; crude birth rate; infant mortality rate; crude death rate; percentage of one person households; and the proportions of the population in social classes IV and V.

Some of these factors were included because they had been recorded[1 2 5-8] as influencing visiting rates—for instance, earlier studies suggested that the age of patients and their social class might be important. Other factors were included because they seemed to be intuitively relevant—for example, population density, a hybrid factor that may be seen as pertinent to either the organisation of medical practice (since it affects the doctor's travelling times) or to community characteristics. This was included in the former group for purposes of analysis.

The list of factors was not exhaustive. More data on morbidity would have been desirable:[9] as it was, infant mortality and crude death rates had to be used as a surrogate. Similarly, more information on the characteristics of the medical practitioners—their training, for example—would have been relevant, as would data about the local availability and use of emergency services.[10] Some of the data might be more illuminating if available in a different form: thus, the proportion of GPs authorised to use a deputising service did not show how many of them actually did so, and to what extent. Inevitably, lack of data inhibited the analysis.

The first step in the analysis was to look at the correlation between the implied night-visiting rates and the individual factors (table III). Taking the demand factors, no single variable was strongly correlated with visiting rates. The strongest were the proportion of population in social class V ($r=0·405$) and the infant mortality rate ($r=0·239$): visiting rates tended to rise as the proportion of unskilled manual workers and the infant mortality rates increased in the population. These two factors were, in turn, related since infant mortality rates were highest in social class V.[11] Surprisingly, the proportion of the elderly in the population seemed unimportant. Turning to the supply factors, the strongest relation was with deputising services ($r=0·520$). There was an inverse relation between visiting rates and the percentage of GPs in partnerships of four or more ($r=-0·365$), but the relation with list sizes, age of GPs, and the proportion of singlehanded family practitioners was weak.

The problem in interpreting these results was that many of these factors were correlated with each other. There was not only the relation, already noted, between social class and infant mortality ($r=0·543$); there was also a relation between social class V and deputising services. ($r=0·454$). All three were related to population density. A step-wise multiple regression technique was therefore used to identify what combination of the independent variables best explained the variations in implied night-visiting rates. This was done separately for, firstly, all the variables; secondly, for those on the supply side; and, thirdly, for those on the demand side.

The results of this exercise are summarised in table IV. Looking at the first analysis, which includes all the variables, line (*a*) shows the equation that best explains the variations in visiting rates, using only those variables whose regression coefficients are statistically significant at the 0·05 level. Line (*b*) shows the regression coefficients' statistical significance. Additionally, line (*c*) gives a standardised measure of each variable's relative "weight" in the equation. Two factors have most effect in this explanation of the variations: deputising services and the proportion of the population in social class V. And of these two, the

TABLE III—*Variables used**

Description	Mean value	Standard deviation	Simple correlation coefficient with implied night-visiting rate
Dependent variable:			
Implied night-visiting rate per 1000 registered patients	8·86	2·50	
"Demand" variables:			
Population aged 65-75 (%)	9·1	1·7	−0·005
Population aged 75 and over (%)	5·1	1·3	−0·182
Population aged under 5 (%)	7·7	0·9	0·074
Crude birth rate	13·8	1·5	0·037
Infant mortality rate	18	4	0·239
Crude death rate	12·6	2·0	0·107
Population in social class IV† (%)	16·0	2·6	0·137
Population in social class V† (%)	8·5	3·0	0·405
One-person households (%)	6·5	1·5	−0·056
"Supply" variables:			
Average list size	2432	216	0·055
GPs in singlehanded practices (%)	29·8	16·0	0·066
GPs in partnerships of 4 or more (%)	16·3	10·8	−0·365
GPs aged under 40 (%)	28·1	6·4	−0·071
GPs aged over 55 (%)	25·6	8·9	0·140
GPs authorised to use a deputising service (%)	28·4	34·5	0·520
Population density per acre	9·15	7·43	0·217

*For full details of variables and their sources see Buxton and Sayers.[9]
†A close socioeconomic group proxy was used.

TABLE IV—*Summary of regression equations: implied night-visiting rate as dependent variable*

		Constant	GPs authorised to use deputising service (%)	Average list size	GPs in partnerships of ≥4 (%)	Population density per acre	Population in social class V (%)	One-person households (%)	Crude birth rate	Population aged 65-75 (%)
Using all independent variables:										
Multiple R = 0·65 R^2 = 0·43	(a)	18·5	0·044	−0·033		−0·090	0·370	−0·319	−0·303	
	(b)		0·000	0·007		0·021	0·000	0·044	0·045	
	(c)		0·61	−0·25		−0·27	0·44	−0·19	−0·19	
Using "supply" variables only:										
Multiple R = 0·56 R^2 = 0·32	(a)	12·9	0·041	−0·002	−0·041	−0·055				
	(b)		0·000	0·089	0·064	0·100				
	(c)		0·57	−0·14	−0·17	−0·16				
Using "demand" variables only:										
Multiple R = 0·45 R^2 = 0·20	(a)	5·2					0·385	−0·380		0·312
	(b)						0·000	0·039		0·064
	(c)						0·46	−0·23		0·21

(a) Unstandardised regression coefficients.
(b) Level of probability of unstandardised regression coefficient.
(c) Standardised regression coefficients.

deputising services factor (standardised regression coefficient, src = 0·61) carries more weight than social class V (src = 0·44). All the other factors that are statistically significant—population density, the proportion of single-person households, and the birth rate—make smaller contributions to the equation and, interestingly, are negatively correlated. Turning to the second equation, using only supply variables, deputising services are the only important factor (src = 0·57). If a lower level of statistical significance is accepted, and other variables are allowed into the equation, list size, the percentage of GPs in partnerships of four or more, and population density are negatively correlated but have a weak explanatory power. The third equation, using only demand variables, confirms the importance of social class V within that group (src = 0·46). The proportion of single-person households and of the population between 65 and 75 are negatively and weakly correlated with visiting rates, though again the latter only at a lower level of statistical significance.

In interpreting these results, it is important to stress that the first equation—which includes both supply and demand factors—can explain only 43% of the variations in implied visiting rates. Inevitably, the other equations explain less. The supply variables give an R^2 of 0·32; the demand variables give an R^2 of 0·20. Apparently, factors associated with the organisation of medical care are more important in determining visiting rates than those associated with the characteristics of the patient population. Consistent with Logan *et al*,[12] these results support the thesis that supply of medical care is more important in shaping use than demand: it is not so much the patients as the producers—doctors and others—who effectively determine what happens. Equally, the importance of deputising services in explaining variations is consistent with the upward trend in implied visiting rates over time noted earlier, since they were increasing in the scale of their activities during the period in question.[13]

Once again, however, this finding might reflect the fact that deputising services have a greater propensity to visit or simply a greater propensity to claim—or both. On the one hand, deputising services may be more ready to visit than individual practitioners, who are better placed to judge whether or not to make a visit in response to a call. On the other hand, family practitioners have more incentive to forward the claim for the night-visiting fee if they themselves are paying the deputising services.

Indeed a differential propensity to claim may also contribute to the 57% of variations left unexplained by the best equation. If this were the main explanation, however, one would not expect a geographical bias in the unexplained residual. But, in fact, when implied visiting rates for executive councils are compared with the rates predicted by the equation, a regional bias emerges. In particular, two of the standard regions are more consistently above or below the expected figures than the rest: the north, where 13 out of 14 executive councils had a higher than predicted visiting rate, and the south-west, where seven out of nine executive councils had a lower than predicted rate.

The General Household Survey[14] shows that the north has a particularly high incidence of long-standing illness and—for men—of restricted activity days, while the south-west is well below the national average on both counts. Similarly, these two regions are somewhat different in the practice-orientation of their GPs.[15] Possibly, therefore, more of the variations in night-visiting rates could be explained if better data on morbidity and GP attitudes were available for the executive council areas.

Implications for policy

Two policy issues are raised by the analysis of the data for night-visiting payments. The first is whether, counter to the anecdotal evidence, the rate of actual night visiting has been rising. This might reflect the fact that night visiting is increasingly being taken over by deputising services. If the rate of night visiting is seen as a measure of the care provided to the patient then the continuation of deputising services would improve performance in terms of this indicator. The second issue is why the only patient-linked factor to emerge strongly from our analysis is the proportion of the population in social class V. Other population characteristics are not significant or have little explanatory power. This might suggest that family practitioners tend to determine the level of service, irrespective of the circumstances of their patients.

Both these points underline the importance of recording GP activities, including night visits, so as to allow trends over time and variations between practices to be analysed. If it is desirable, in the words of the Committee of Enquiry into Competence to Practise,[16] "for all doctors to assume responsibility for reviewing their own work with the assistance of their colleagues in similar fields of practice," then it is essential that such reviews should be based on the systematic collection of data rather than on what may be misleading, atypical information based on the experience of a handful of practices. Only on the basis of adequate information can family practitioners develop a consensus about explicit criteria to be used both in "educating" patients about when to request night calls and in deciding when to visit in response. For these criteria to depend on the idiosyncracies of individual practitioners cannot be a satisfactory state of affairs either for the medical profession or for patients.

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I look after several growing boys with treated spina bifida. Most of them still have CSF shunts with Spitz-Holter valves in situ, which have presumably long ceased to function. Should they be removed when the necessity for them ceases?

Shunt surgery for hydrocephalus (Spitz-Holter or Pudenz-Heyer valves) have been used in Britain since 1958.[1] Although no adequate follow-up figures have been published, it is likely that at least half the children treated for hydrocephalus (with or without myelomeningocele) seem to manage without a functioning shunt by the age of about 10 years. Unless revised (and lengthened) at intervals a shunt inserted during the first few months of life is certain to block within a few years because of the growth of the patient. It is by no means unusual to see 10-year-olds with clinically (and radiologically) blocked shunts who are symptom-free and well. It is thought, but not proved, that these equilibrate at a higher intracranial pressure than normal, and it is well recognised that mild trauma to the head or intercurrent infection may lead to renewed symptoms of hydrocephalus (requiring further surgery) after many years without a functioning shunt. In any event removal of a non-functioning shunt is not indicated in the absence of localised symptoms; blocked shunts do not cause bacteraemia or embolism. There is a real risk of ventricular haemorrhage if a shunt is removed, and the distal catheter may become so adherent to the vein that its removal is almost impossible.

1 Eckstein, H B, and Macnab, G H, *Lancet*, 1966, **1**, 842.

A 28-year-old patient has beta-thalassaemia minor. She has no children but wants to know what the chances are of any child of hers having thalassaemia in any form, or of being a carrier.

If her husband is normal each child has a 50-50 chance of being affected or normal. There are usually no overt clinical abnormalities in beta-thalassaemia minor; the carrier state is detected only when the blood is examined for any reason by an alert technician. A few affected people show mild anaemia that is resistant to iron treatment and, occasionally, signs such as leg ulcers. It is not yet possible to detect in advance who will be so affected. There is some evidence of racial influence—for instance, Italians seem more likely to have such symptoms in beta-thalassaemia minor. If her husband also has the trait there is in addition a 25% chance of any child being affected by the fully developed beta-thalassaemia syndrome. So it is important that the husband's blood should also be examined.

The DHSS recently sent out a sheet on the comparative cost of iron preparations. It quoted from the British National Formulary 1976-8 "The dosage of elemental iron should be at least 100 mg daily." Is this statement based on custom?

I have no doubt the statement is based on custom rather than specific evidence, though it does conform to a general view. There are several factors influencing the effectiveness of iron treatment,[1] including the type of compound, additives, speed of release, and mixing with food. Continuing blood loss will alter the therapeutic response. There appears to be little difference between the effectiveness of 180 mg/day and 100 mg/day of iron as ferrous sulphate in terms of rise in haemoglobin concentration or the accumulation of iron stores, and no appreciable advantage is found when ascorbic acid is added.[2] Controlled release preparations, some of which are extremely expensive, offer no advantages and may be poorly available for absorption.[1]

1 Callender, S T, in *Iron in Biochemistry and Medicine*, ed A Jacobs and M Worwood. New York, Academic Press, 1974.
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What are the respective merits and demerits of baclofen and dantrolene in treating muscle spasms in multiple sclerosis?

Baclofen diminishes reflex activity in the spinal cord and inhibits synaptic transmission. It is related to gamma-aminobutyric acid and has been shown to have an inhibiting action on cortical and cerebellar neurones and is thought to act specifically at the spinal level. It is useful in controlling clonus and for its central sedative effect.[1] It is advisable to start with a low dosage and increase this gradually until an optimum effect is achieved, usually 40-60 mg/day. Dantrolene acts by reducing the force of contraction of the muscle without reduction in the relaxation time.[2] The initial dose should be 25 mg daily and this can be increased to 200 mg daily in divided doses. Zaimis[3] suggested that beta-adrenoreceptor stimulants may also help to alleviate spasticity. These drugs increase the speed of relaxation of slow-contracting muscles and lessen the muscular hypertonia characteristic of the spastic state. Of the two drugs baclofen is more likely to help muscle spasms in multiple sclerosis, although the effect of this drug even in relatively large doses may not be very obvious.

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3 Zaimis, E, *Lancet*, 1973, **1**, 403.