

## ***A study of general-practitioner consultations in North-east Scotland***

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An increasingly insistent plea has been heard recently for more facts about the work of general practitioners. Even a cursory glance at the Annual Reports of the Departments of Health will reveal how scarce is numerical information about general medical services relative to that produced by the public health and hospital components of the National Health Service. Despite a rising number of studies by individuals or by small groups of general practitioners, recently collated by the Royal College of General Practitioners (1970), there is still plenty of scope for larger scale studies designed to measure the factors that produce variation in workload.

In 1968 the Department of General Practice in Aberdeen University and the Research Committee of the North-east Scotland Faculty of the Royal College of General Practitioners examined the research potential of the region. We were impressed by the recently published report on workload in South-west England (Wright, 1968) and by the similar study being conducted in South Wales (Williams, 1970). Stevenson (1964) suggested that patterns of doctor-patient consultation were different in Scotland.

### **Aims**

The main aim was to estimate each doctor's consultation *rate* and to examine the correlation between this figure and—

- (a) *characteristics of the doctor*—age, sex, postgraduate training, list size, number of partners, practice organisation, attitudes to general practice, and policy on home visiting and return consultations;
- (b) *characteristics of the patients*—age, sex, occupation and morbidity.

A second aim was to reconnoitre the vast subject of drug usage in general practice, by collecting information on drugs prescribed at each consultation. We considered a few simple questions—how many different drugs do doctors have to remember, how much variation is there between doctors in their use of common drugs, what are the problems to be faced in considering drug monitoring in general practice?

Thirdly, we wished to feed back useful or interesting results to the participating doctors.

### **Methods**

At the outset we were faced with the problem of achieving the best compromise between much information from a few doctors and a little information from many. We chose the latter policy and we decided to ask for nine items of information about every consultation on one day a fortnight during the period May 1969–April 1970. The information sought about consultations was: age and sex of the patient; occupation of patient; duration and location (surgery, home or elsewhere) of the consultation, whether it was a first or return contact, and whether it was a direct or indirect (phone, letter or third party) consultation; diagnosis; drugs prescribed.

After six months of recording, duration of consultation and patient's occupation were deleted and a column for referral of patients introduced.

Each doctor was also asked to complete a questionnaire which included: doctor's age, date of graduation, and appointments held prior to entering general practice; location of practice—Aberdeen City, town (defined as 1,500 or more population), and rural; list size—personal and practice, number of partners; organisation—appointments system, secretary/receptionists, nursing attachments, hospital and other appointments; four-point scales on attitudes to general practice, health centres, and postgraduate education.

Finally, each doctor's permission was sought to construct a sample age-sex register of his practice, using executive council records. A one-in-five sample was drawn.

Explanatory letters were sent to all 253 mainland principals in the North-east region; 163 accepted, a response rate of 64 per cent. During the year of data collection, 147 of the 163 starters maintained a high level of recording; ten withdrew and a further six made only limited returns. Considering the extra work involved in recording and the sharp influenza epidemic of December/January this sustained response was good. In most of this paper the results are derived from the returns of 142 doctors, the other five being omitted because their information was partly incomplete.

Anonymity was strictly preserved by allocating a code number to each doctor. The participants were grouped by a code letter A–N, and each group was allocated its recording days for the year of study, using a randomising technique which ensured an even spread over the days of the week and the seasons of the year. At the outset each doctor was sent a list of all his recording dates. Prior to each recording day, forms were posted to the doctor with a prepaid envelope. Issue and returns were logged in a register which also noted the reasons for nil returns where these were known.

Though plans had been made for data processing, we were frankly overwhelmed by the sheer volume of data, an experience from which, as measured by the use made of the information, we have by no means recovered.

### Results

Table 1 shows the average number of direct consultations recorded by day of week.

TABLE 1  
AVERAGE NUMBER OF CONSULTATIONS BY DAY OF WEEK FOR 142 DOCTORS

	<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednes- day</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
<i>Average of all doctors</i>	6	37	33	29	25	32	18
<i>Lowest individual average</i>	0	12	3	1	1	5	0
<i>Highest individual average</i>	15	107	131	115	81	83	72

The wide variation in the number of patients seen by individual doctors on each day, especially during the week, is the product of several factors—practice size, half-days, and rota schemes are obvious. But even on Monday, which is usually reckoned to be the general practitioner's busiest day, and when few doctors are off duty, there is still a large difference between the highest and lowest individuals.

The first step in the exploration of this variation was to convert the consultations into a rate per 1,000 patients per day. We chose the per-day rate, first, because of the sampling procedure, and second, to avoid the error inevitable in computing a per annum rate from a sample of (on average) just over 20 days' work. In passing it may be of interest to note that the estimated number of consultations per patient per year for all the doctors involved was 4.4—as expected. In calculating the denominator for doctors in partnership, the total practice list was divided by the number of partners.

It must be emphasised that a consultation rate does not indicate the absolute workload or

number of patients seen; the rate used here is a relative measure of doctor-patient consultations which allows an epidemiological analysis of factors associated with it. Table 2 shows the pattern of this rate by day of week.

TABLE 2  
CONSULTATION RATE PER DAY PER 1000 PATIENTS

	<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
<i>Average of 142 doctors</i>	3.4	20.2	17.8	15.7	13.5	17.2	9.9
<i>Lowest individual average</i>	0.0	5.4	6.7	1.6	1.5	2.5	0.0
<i>Highest individual average</i>	26.5	47.5	37.5	49.5	56.5	44.9	34.0

Figure 1 shows the distribution of the average daily consultation rate for the 142 doctors; round the mean of 14.8 there is considerable variation with a long tail towards the high consultation rate end of the graph.

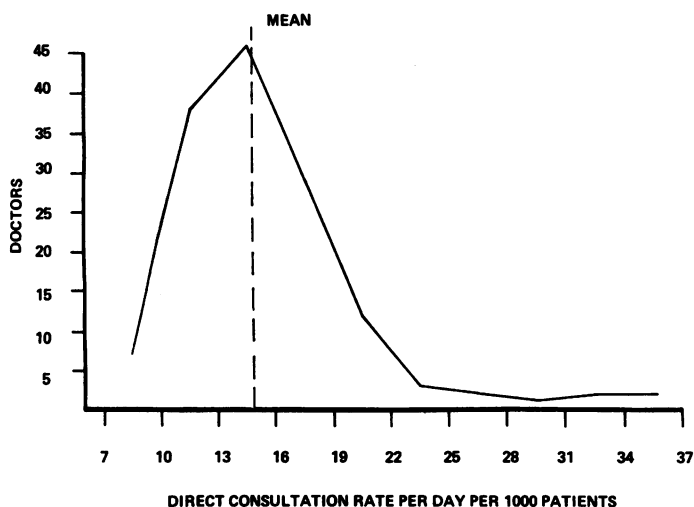


Figure 1

One doctor saw over 100 patients on seven of his recording days (four Mondays and three Wednesdays), who averaged 74 consultations per day (including Saturdays and Sundays) and had a consultation rate per day per 1,000 patients which reached 31.6. The very low extreme figures per day for each weekday were mostly accounted for by individual doctors' half-days, and some but not all of the high figures were due to cover for colleagues on holiday.

We next explored the associations of this substantial variation in consultation rates.

#### *Variation in consultation rates*

Since many of the doctors were known personally to us, some of the findings came as no surprise.

Dr A. is a part-time hospital consultant; his very low consultation rate of 7.5 per 1,000 patients per day is clearly determined by his hospital commitment.

Dr B. is a married woman in partnership with her husband; not only was her consultation

rate relatively low, her proportion of home visits was well below average; both indexes were presumably due to her domestic commitments.

Dr C. is about to retire; her consultation rate of 7.6 represents a pre-retirement phasing-out.

Dr D. and Dr E. are in very small remote practices; their consultation rates of 31.0 and 34.9 respectively reflect the time they have available through comparatively light demand.

Dr F.'s consultation rate of 31.6 is an expression of his life-long policy of frequent attention especially through home visits of the elderly patients on his above-average list of patients.

The analysis showed an association between high consultation rates and (a) small list size, and (b) a high proportion of return visits. On the first of these associations some comment has already been made, but it must be emphasised that the relationship between list size and consultation rate is not linear. Nevertheless, this finding, noted in other studies (Royal College of General Practitioners, 1970), suggests that patients in small practices receive more attention, a point of possibly considerable significance should list sizes begin to diminish.

#### *First and return consultations*

Figure 2 shows the spread of the proportion of return consultations. Even with generous allowance for the ambiguity inevitable in deciding whether some consultations were first or return, it is clear that there is wide variation between doctors in their follow-up policy.

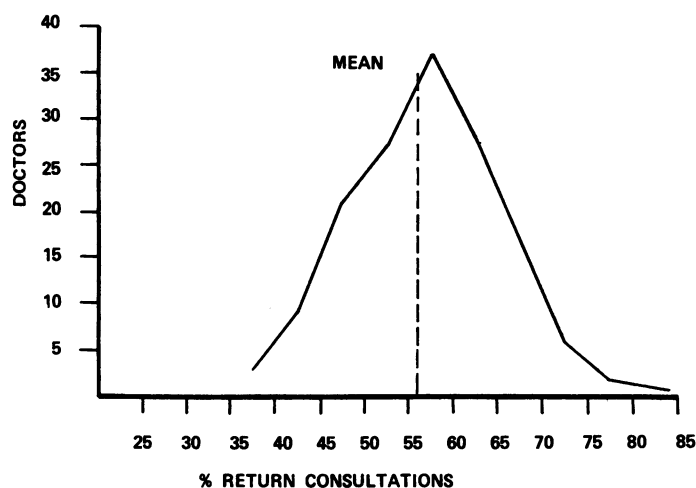


Figure 2

Figure 3 points to one factor responsible for this variation—the age distribution of the practice population. Within the City of Aberdeen there are considerable differences between practices in the proportion of patients who are very young or very old; the percentage of children under five ranged from 12.5 to 3.6, the percentage of patients age 65 and over ranged from 21.6 to 5.0. Outside the city there was slightly less variation over all, though in some isolated areas doctors had a high proportion of old people. These practice differences in age distributions did not, however, account for more than a small proportion of the total variation in consultation rates.

It seems to us that the biggest single factor affecting the proportion of return consultations, and therefore work load, is the doctor himself. Though first consultation rates also varied, the return rates were more variable. First consultation rates are the product of a complex set of factors but one of these is likely to be the experience of the patients which, in turn, must reflect the doctor's attitudes and policy. In other words, because the rate of return consultations is substantially under the doctor's own control, he can influence his own work load.

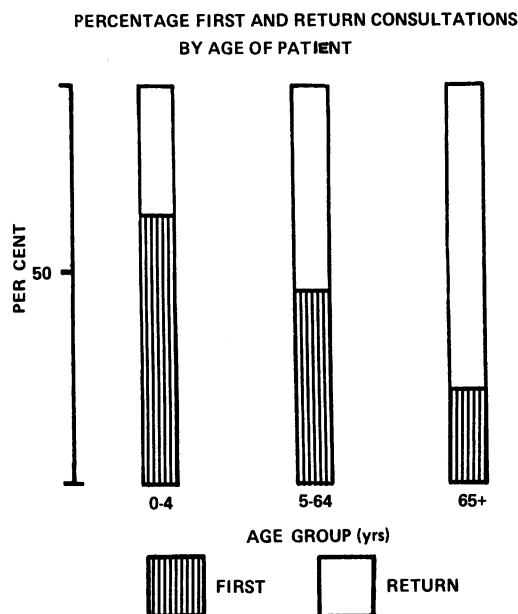


Figure 3

Table 3 shows the relationship between variations in first and return consultation rates and years in general practice.

TABLE 3  
VARIANCE OF CONSULTATION RATES AND YEARS IN PRACTICE

Date entered general practice	Number of doctors	Variance of consultation rates	
		First	Return
1955 & later	58	2.46	3.88
1946-1954	56	3.06	16.64
Before 1946	28	3.31	21.52

In all three groups of doctors, return consultation rates show a highly significant increase in variability compared with first consultation rates. Also, the variations increase with experience, though only the differences in variation of return rates reach statistical significance. Exactly what these trends reflect can at present only be speculative but there appears to be an 'experience effect' which may be due either to a generation or cohort influence or to some hidden difference between patients attended by doctors of different age or experience.

#### *Place of consultation*

Figure 4 shows the variation among doctors in the proportion of consultations in the patient's home. There is a wider scatter on both sides of the average value of 39 per cent, a figure which is well above most of those given in the 1970 Report of the Royal College of General Practitioners.

In Figure 5 can be seen the effect of patient-age on the place of consultation, old people being the commonest recipients of the home visiting service. The number of home visits expressed as a percentage of all consultations was examined by list size, location of practice, and age of doctor (Table 4).

The only apparent significant factor was the location of the practice, slightly fewer home consultations being made in the country ( $P < .05$ ,  $t = 3.24$ ). However, as the opinion is often

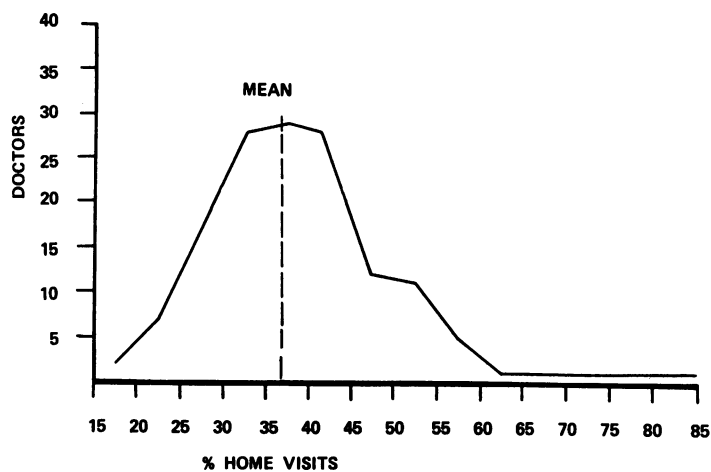


Figure 4

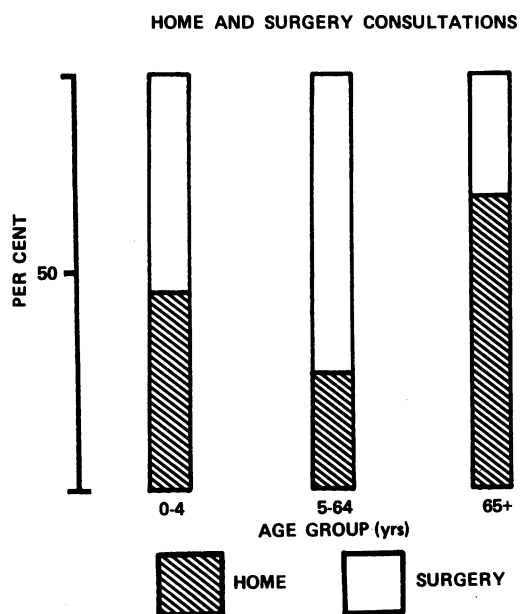


Figure 5

TABLE 4  
MEAN PERCENTAGE OF HOME VISITS

Location of practice	List size (thousands)			
	0.5 to 2.0		2.1 to 2.8	
	Doctors under age 45	Doctors age 45 and over	Doctors under age 45	Doctors age 45 and over
City	40.2 (N=10)	45.7 (N=7)	38.8 (N=12)	37.2 (N=13)
Country	37.5 (N=38)	41.8 (N=33)	35.1 (N=8)	35.4 (N=13)

expressed that older doctors more often visit patients at home than do younger doctors, it was decided to examine this in more detail (Table 5). Comparisons were made between the youngest and oldest partner in 21 practices in which the youngest was under age 45 and the oldest over 45. Single-handed country doctors, of whom six were under 45 and seven were over 45, were also compared with one another.

TABLE 5  
LOCATION OF CONSULTATION AND AGE OF DOCTOR

Age of patients (years)	Age of doctors (years)	Percentage of consultations conducted in patient's home	
		Single-handed country doctors (6 < 45 yrs.) (7 < 45 yrs.)	Pairs of doctors in partnership (21)
0-4	< 45	42	55
	> 45	35	47
5-64	< 45	25	28
	> 45	27	28
65 & older	< 45	65	68
	> 45	63	69

In these two groups there was no evidence of any difference between younger and older doctors in the proportion of home visiting. There was, however, a slight difference in the age groups of patients seen, older doctors seeing marginally more older people and marginally fewer children.

There is evidence of a decline in the proportion of home visits by British general practitioners not only as a consequence of more attractive surgery premises and appointment schemes, but also because many general practitioners find the facilities in the surgery itself and their saving of travel time combine to provide a better service to more patients. In another study (Buchan and Richardson, 1972) we have shown that in terms of efficiency both reasons can be substantiated.

The average level of home consultations in this study (39 per cent) is relatively high. Analysis of variance showed a slight but not significant association with list size, so it seems unlikely that the comparatively smaller size of practices in North-east Scotland could be the explanation. We think it would be unfortunate if the question of domiciliary consultation and its decline were left in its present state; its advantages to patient and doctor seem outweighed at the moment by the arguments in favour of the surgery as the preferred place of consultation. Apart from opinions by patients and doctors on points such as accessibility and efficiency, there is the possibility that consultation in the home yields more information about the patient and his illness, and it seems to us that this could be a fruitful area for further research.

### Partnership

Financial arrangements and off-duty considerations apart, one result of two or more doctors entering into partnership could be the development of a common work-load policy. It is, for example, likely that a young doctor entering a practice will, even if he has already completed a trainee assistantship, for some time be learning from his more experienced partners how often and where to consult. It can also be argued that a harmonious partnership will depend (*inter alia*) on an equitable sharing of work. These theoretical points made us look at our data to see if the variation in consultation rates, return consultations, and home visits, was related to partnership; the findings are shown in Table 6 for partnerships of two and three doctors, there being too few larger partnerships for analysis (not all partners in group practices took part in the study).

The data in Table 6 indicate that in both city and country practices there was less variation within than between partnerships, suggesting that partners do tend to operate a common practice

TABLE 6  
VARIABILITY BETWEEN AND WITHIN PARTNERSHIPS

		Variance estimates	
		City	Country
	Number of doctors	31	34
All doctors	Consultation rates	7.6	29.5*
	% Return consultations	70.5	81.4
	% Home visits	60.2	117.6*
		Between partnerships	Within partnerships
City doctors	Degrees of freedom	8	13
	Consultation rates	13.5	8.5*
	% Return consultations	132.2	36.0
	% Home visits	84.5	66.4
Country doctors	Degrees of freedom	21	29
	Consultation rates	35.0	13.1*
	% Return consultations	70.6	46.6
	% Home visits	135.3	43.0

\* Indicates P less than 0.05, i.e., significant.

policy on frequency and location of consultations. This seems to us an important demonstration in view of the steadily increasing growth of group practices and suggests that more detailed study of how such policies develop and are reviewed would be a useful area for investigation.

### Morbidity

Though there is now a substantial literature on the 'diseases of general practice', the gist of which is that the variation between doctors in the broad pattern of illnesses they see is apparently considerable, the major problem with morbidity in general practice is its classification. Despite valiant efforts by the Royal College of General Practitioners to adapt the *International Classification of Diseases and Injury* to the general-practice situation, the fact remains that many 'illnesses' presented by patients to the family doctor just do not fit neatly into existing categories. This means that the doctor must either stretch, or squeeze, the symptoms and signs to an unrealistic shape, or assign them to a residual category such as 'ill-defined', and it further imposes a similar requirement on the coder.

We encountered this problem early, and can offer no satisfactory solution. Table 7 shows the distribution of the 'diagnosis' in 80,475 direct consultations, using the 19 summary categories of the *International Classification*, and compares our findings with those from the South-west England study (Wright, 1968).

Though generally similar, the two studies show a few substantial discrepancies which we believe must be mainly attributed to differences in coding procedures; for example, if pregnancy and prophylactic categories are summed, the proportions are about the same. We probably coded relatively more diagnoses to 'ill-defined' and rather fewer to psychoneurosis, and so on. Respiratory illness emerges as by far the largest single category of illness seen by the general practitioner. We have already reported (Howie, Richardson, Durno and Gill, 1971) on the use of the data on respiratory illness.

As would be expected from so crude a classification, there were large differences between individual doctors in the proportions of consultations allocated to the 19 categories. This simply re-emphasises the unsatisfactory state of our knowledge of the criteria used by different doctors in 'diagnosing' or labelling a large number of clinical syndromes, a deficiency that severely restricts exact epidemiological study of morbidity distributions in general practice. Clearly a great deal of work has yet to be done on improving the validity and reliability of disease classification in general practice before the influence of morbidity on work load can be more precisely established.



TABLE 7  
PERCENTAGE OF CONSULTATIONS

<i>Category of disease</i>	<i>N.E. Scotland</i>	<i>S. Wales</i>
Communicable	5.7	3.2
Neoplastic	1.9	2.1
Endocrine/allergy	2.2	4.2
Blood	1.8	1.6
Psychoneurosis	4.4	6.3
C.N.S./sense organs	6.1	8.3
Circulatory	10.3	8.4
Respiratory	21.6	22.3
Digestive	5.0	7.5
Genito-urinary	4.5	4.2
Pregnancy	< 1	6.0
Skin	5.2	5.6
Locomotor	6.8	6.1
Congenital	< 1	< 1
Early infancy	< 1	< 1
Ill-defined	6.5	2.1
Accidents	7.1	7.6
Prophylactic	3.5	2.6
Administrative	< 1	< 1

#### *Other variables*

Participating doctors had supplied information on a number of aspects of practice organisation, including appointments schemes, number of secretary-receptionists, and whether health visitors and nurses were attached. These items were examined in relation to consultation rates.

TABLE 8  
ANCILLARY STAFF BY CONSULTATION RATES

	<i>Consultation rate</i>				
	<i>7.5-11.5</i>	<i>11.6-15.0</i>	<i>15.1-18.5</i>	<i>18.6 &amp; over</i>	<i>ALL</i>
<i>Number of doctors</i>	26	47	46	23	142
<i>Mean list size</i>	1895	1974	1857	1380	1829
<i>Number of secretaries per practice</i>	1.4	1.5	2.0	0.8	1.5
<i>Number of nurses per practice</i>	0.4	0.5	0.6	0.3	0.5
<i>Number of health visitors per practice</i>	0.3	0.4	0.5	0.2	0.4

In the smallest practices, where the consultation rate is high, ancillary help is relatively small—hardly a surprising finding because both need and resources in such practices are smaller. The trend in the rest of the table is more difficult to explain; list size appears to bear little relation to ancillary help, so again one is forced to conclude that ancillary, but especially secretarial, help is a function of individual doctors' attitudes to practice organisation and teamwork. This is confirmed by the absence of any relationship between consultation rate and the proportion of doctors using an appointments system.

At the outset of the study participating doctors were asked to rate on a four-point scale, their satisfaction with general practice, their attitude to health-centre practice, and their view of post-graduate education. None of these crude attitude scales showed any correlation with the distribution of consulting rates, but it may be of some interest to record what these doctors felt at the time of the survey (1969).

Very satisfied with general practice	31 – 22%
Reasonably   "   "   "   "	88 – 52%
Rather dissatisfied   "   "   "	22 – 15%
Very   "   "   "   "	1 – 1%
TOTAL:	142 – 100%
Would like to practise from health centre now	38 – 27%
Willing to consider health centre if conditions acceptable	54 – 38%
Prefer to remain as at present but may consider it in future	44 – 31%
Dislike the idea and want nothing to do with it	5 – 4%
TOTAL:	141 – 100%

In spite of the reservations that must be applied to the results of these simple tests of complex attitudes, we find two points encouraging; first, there is little sign of a rigid stereotype response, and second, neither excessive conservatism nor low morale are evident.

In retrospect, the request for precise statements of patients' past, present, or parental occupation was a mistake. Doctors were mostly too busy to obtain this information, so the large number of blanks or 'housewife' or 'retired' made the data too inadequate for analysis.

Despite valiant recording by the doctors of the drugs prescribed, we have so far been unable to make much of this information, except for the study of antibiotic usage (Howie *et al.*, 1971). The main reason has been the lack of a suitable drug coding system, but this has recently been to some extent overcome and we hope later to present some of the findings.

### Discussion

In conclusion, we feel an onus to make some general comments on what we did, why we did it, what we found, and—riskiest of all—what we think the survey has shown.

This paper indicates that an impressive proportion of family doctors are interested in finding out more precisely what they do and are prepared to make considerable extra effort to do so. Indeed, as indicated earlier in the paper, the sheer size of the response 'caught us napping'.

A second general point on which we are agreed is the value of this enterprise in promoting mutual understanding between a College Faculty and a University Department, and in clarifying the roles of each, a question which one of us has referred to elsewhere (Richardson, 1971).

Probably the strongest impression all of us are left with is the wide variation between general practitioners in the quantity of work they do. This must be largely due to the attitude of patients and this in turn will depend, amongst many other factors, on what patients have come to expect of their personal doctor. While clearly much has yet to be learned in this area, our findings point strongly towards the doctor himself as a major source of variation in consulting rates.

Even a small experience of general medical practice helps to explain this; the undifferentiated nature of so much primary illness and the resulting diagnostic and treatment problems, the very different circumstances of doctors in cities, towns and rural areas, the variety of ways of entering practice (including amount and nature of vocational training in the past), the relative isolation of many doctors, these and other variables yet to be assessed are bound, singly and in combination, to produce the range of work we recorded. Since there is now evidence of considerable variation among the work of hospital consultants also (Heasman and Carstairs, 1971), it may be inferred that the art or skill of clinical judgment is not a variable peculiar in quantity or nature to general practice; but equally it must be argued that our own and other workers' data point at least to the possibility of unnecessarily high workload in a proportion of family doctors and to the need for closer study of the reasons for this.

Though our finding of a degree of homogeneity within practice groups suggests a deliberate policy on the way in which that group carries out its responsibilities, there was no clear indication that these groups tended towards the centre of the distribution of consultation rates any more than did solo practitioners.

Next, while still of the view that feedback of results to participating doctors is both courteous and operationally correct, it must be admitted that this exercise appeared to evoke little response in the sense that only a few doctors discussed the results with us. However, we have been told that rather more intra-practice discussion took place than at first was thought, so it is possible that some practical effects ensued.

The final question that all such studies raise is the desirability and feasibility of a continuous 'information system' within general practice, comparable to those that are now an established component of public health and hospital services. In a local study one of us (Durno, 1972) has shown that a simple, cheap system of comprehensive recording of all doctor-patient contacts is compatible with day-to-day practice work—provided that doctors and secretaries are willing to submit to the discipline involved and can see, from well-analysed returns, how practice performance should be modified. An information system could be built in to most practices, given the will and the resources. But even a very modest system of routine recording in general practice would generate a high volume of information which would require sophisticated methods of centralised data handling, a resource that is probably not yet available except in experimental situations such as Livingston New Town (Duncan, 1969; Gruer, 1970).

We ourselves have to concede that for the foreseeable future this survey of work load must remain a 'one-off' exercise, but we are unanimous in believing it to have been worth while.

#### Acknowledgements

For their interest, sustained collaboration, and friendly criticism, we are deeply indebted to all the general practitioners in North-east Scotland who participated in this survey. Grateful thanks are extended to the Royal College of General Practitioners and to the Research and Intelligence Unit of the Scottish Home and Health Department for financial support. Mrs. Pyper, Miss Marr, Mrs. Ledingham, Mrs. Allan and the staff of the data-processing unit of the Department of Social Medicine gave generously of their time and skill on the recording, clinical, and typing of the study.

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