

Office of Health Economics

FACTORS INFLUENCING CLINICAL DECISIONS IN GENERAL PRACTICE

Papers from a symposium
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Edited by
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* Did not attend the Symposium

INTRODUCTION

Jane Griffin

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In January 1989 the Government announced its proposals for reforming the National Health Service in the White Paper 'Working for Patients' (CM555). The two main objectives of the reforms, as outlined in the White Paper, are 'to give patients, wherever they live in the UK, better health care and greater choice of the services available; and greater satisfaction and rewards for those working in the NHS who successfully respond to local needs and preferences.' In highlighting the need for change the Government has cited wide variations in the prescribing habits of general practitioners, two fold variations in the medicine costs per head of population, and twenty fold variations in the rate at which general practitioners refer patients to hospital. By reducing these variations the Government aims to raise the standards of all hospitals and general practices to those of the best.

However, whilst there has been little controversy regarding the objectives of the NHS reforms there has been widespread concern that the changes proposed will not achieve these aims. By concentrating on high levels of activity and cost, whether this is in the area of prescribing or referrals, there is a real danger that pressures for cost containment will prevail at the expense of the more appropriate objective of cost effectiveness. This concentration on the need to restrict and re-educate the high service users may lead to the economic and clinical problems presented by under-treatment and the consequent denial of potential health benefits to patients being overlooked.

Thus it was in the light of these concerns that the Office of Health Economics organised the symposium on 'Factors Influencing Clinical Decisions in General Practice'. The meeting was held at the Ciba Foundation on 23 April 1990 and was jointly chaired by Sir Donald Acheson, Professor T P Whitehead and Professor G Teeling Smith. This booklet contains the eleven papers which were presented for discussion.

Whilst no definitive solutions to the problem of variations were offered during the symposium, the papers presented clearly demonstrate that to look at variations in prescribing and referral rates in isolation is meaningless. Unless it is known at what point clinical intervention is appropriate it is not possible, with any degree of certainty, to say whether a particular rate of prescribing or referral is too high or too low.

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FACTORS AFFECTING MEDICINE USAGE AND RATES OF CONSULTATION

John P Griffin

In 1984 O'Brien reviewed variations in the patterns of European diagnoses and prescribing, concentrating on the UK, Spain, Italy, France and Germany and significant differences were noted.

This and other studies have shown that in certain therapeutic areas there are major differences between countries in the usage of specific medicines. This reflects national differences in the perceived efficacy of certain therapies. For example, co-d-ergocrine has been marketed for the treatment of senile dementia in many EC countries and in a study by Laporte and Capella (1987) it was reported that 1.4 prescriptions of co-d-ergocrine were written per 1,000 population per year in the UK, but that corresponding figures for other EC countries were 33.0 in Germany, 55.0 in France, 88.0 in Italy, 158.0 in Spain and 20.3 in Belgium. In the USA there were 4.3 prescriptions per 1,000 population per year written for co-d-ergocrine.

Due to the risk of aplastic anaemia the use of chloramphenicol is limited yet in countries with sophisticated national regulatory authorities there are wide variations in its use. Average monthly sales in gm/100,000 population for the period 1982-1984 were 6gm in the UK, 7gm in Australia, 22gm in Canada and 123.0gm in Sweden (Kumana et al 1987).

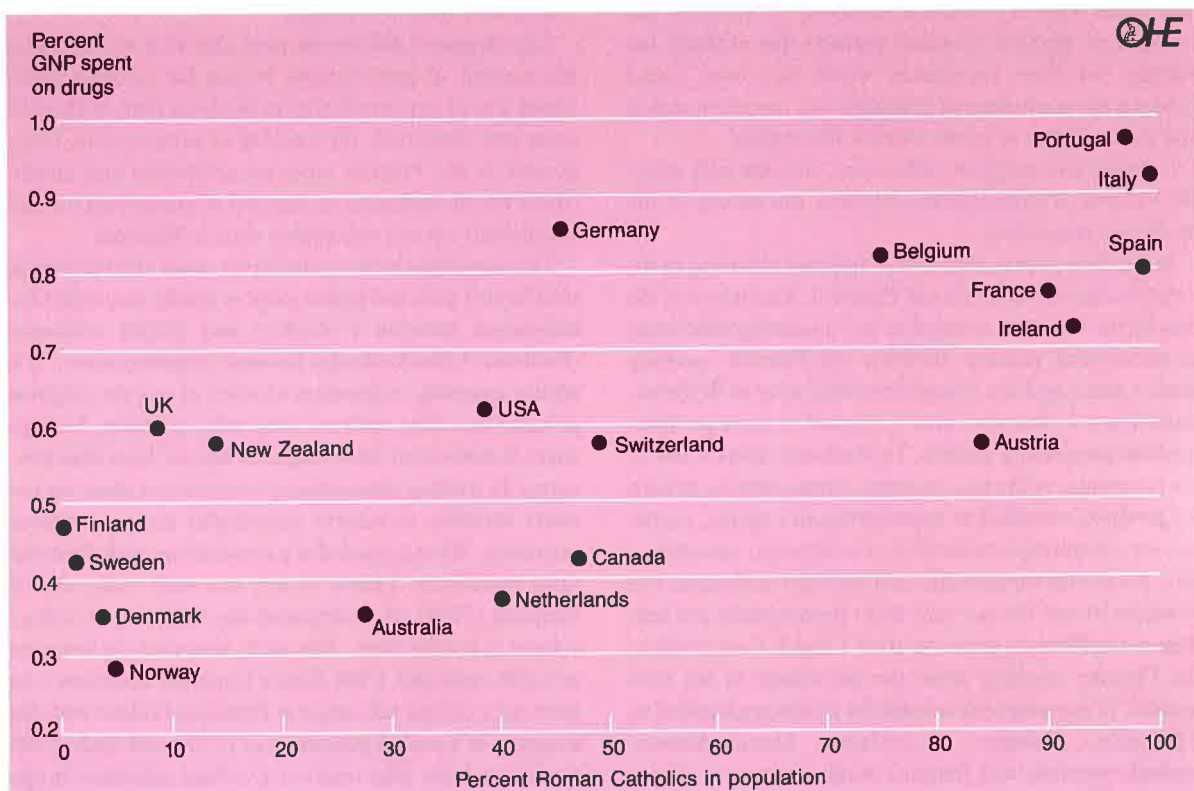
My personal interest in international variations in clinical practice began with my study 'An international com-

parison of adverse reaction reporting systems in 15 countries' which was eventually expanded to cover 16 countries (Griffin 1986, Griffin & Weber 1985 and 1986). The study, which initially was directed at the spontaneous reporting of adverse reactions to medication, was expanded to cover the prescribing patterns expressed as the number of prescription items per head per year, percentage gross national product (GNP) spent on medicines etc. Included in this survey was the relative number of Protestants and Catholics in the community.

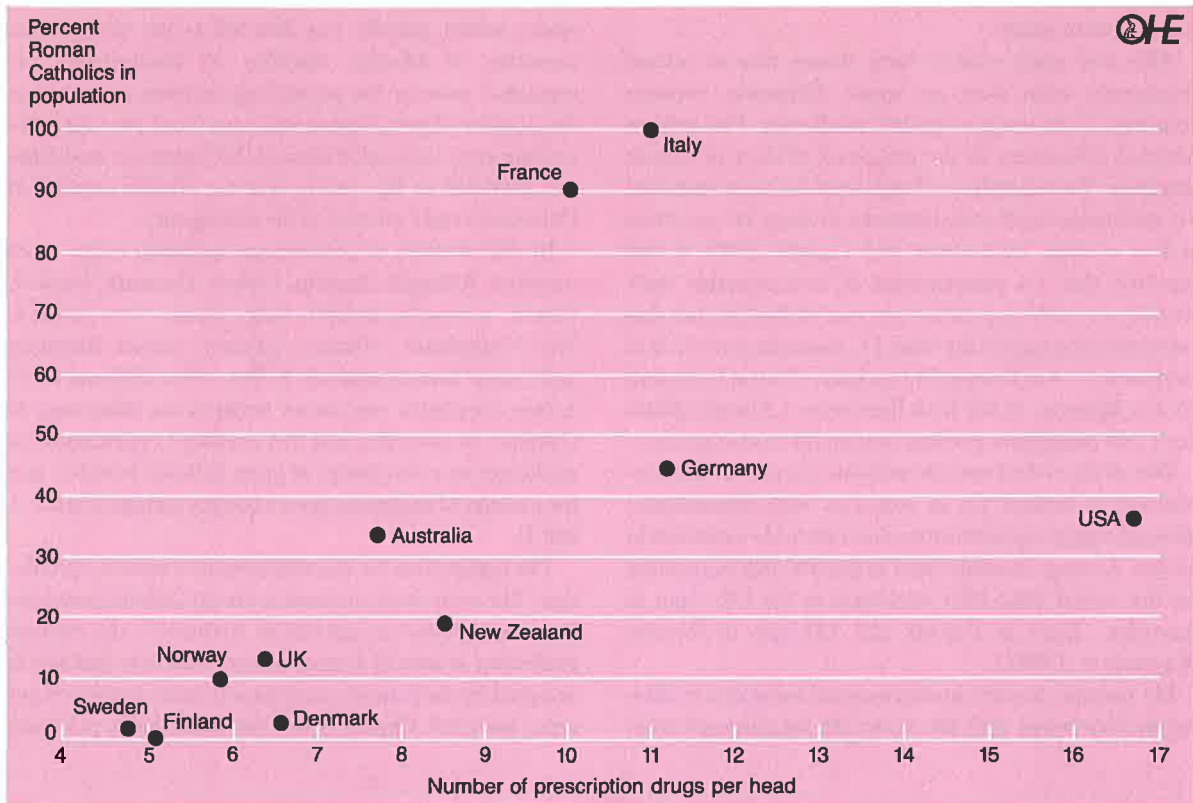
In this analysis of prescription medicine usage in 16 countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, New Zealand, The Netherlands, Norway, Sweden, United Kingdom and United States (Griffin & Weber, 1985, 1986 and 1989) a clear correlation was shown between the percentage of Catholics in a country and that country's expenditure on medicines as a percentage of gross national product, and the number of medicines prescribed per annum (Figures 1 and 2).

The explanation for this relationship is open to speculation. The most likely rationale is that in Catholic countries there is a greater acceptance of 'authority': the medical profession is seen in a more paternalistic role and this is accepted by the patient; consequently more medicines per caput are used. Chorus (1965) did additionally point out

1 CORRELATION BETWEEN THE PERCENTAGE OF CATHOLICS IN THE POPULATION AND PERCENTAGE SPEND OF GROSS NATIONAL PRODUCT ON DRUGS, 1983.



2 CORRELATION BETWEEN THE PERCENTAGE OF CATHOLICS IN THE POPULATION AND NUMBER OF DRUGS PRESCRIBED PER CAPUT/ANNUM



that 'while religion is linked to mentality, so mentality has its links to physical diseases: perhaps this explains the curious yet clear correlation which has been found between the dominance of Protestantism in a given region and the incidence of peptic ulcer in that region'.

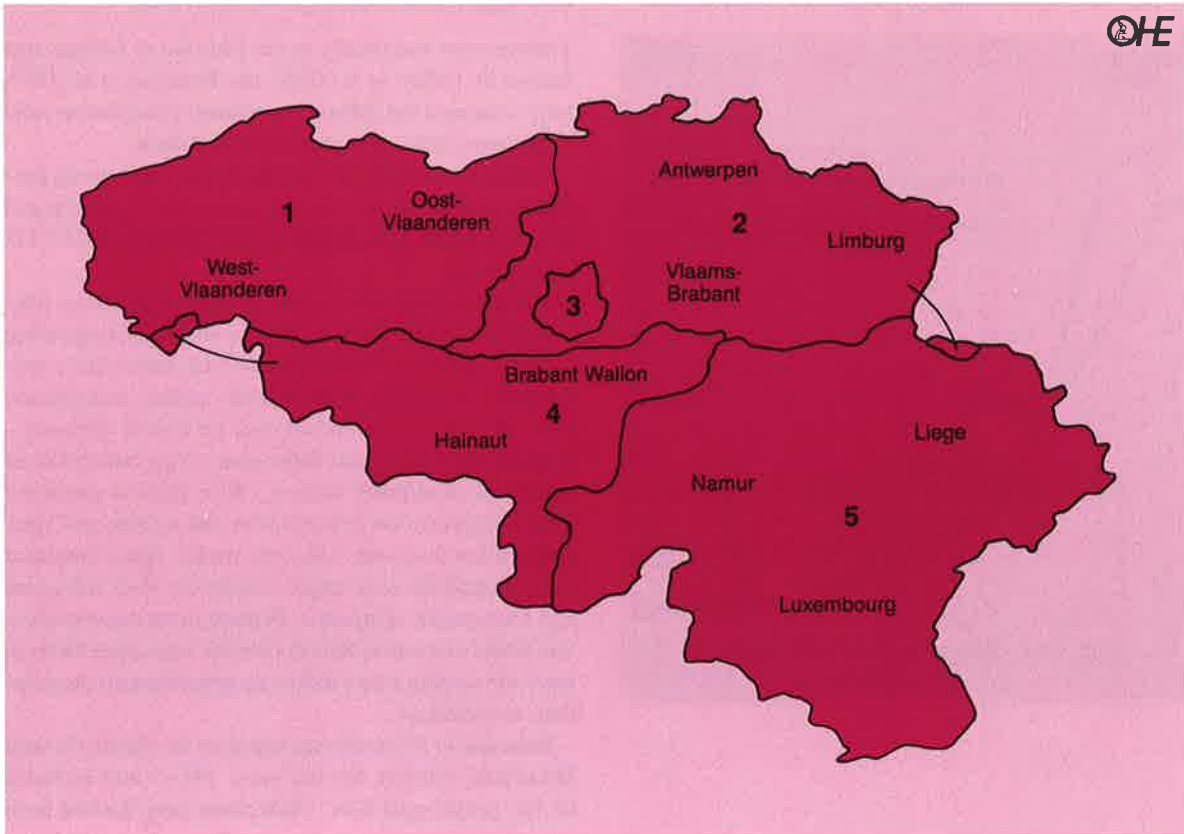
Cultural and religious differences may not only affect the volume of prescriptions but also the nature of the medicines prescribed.

In Belgium prescription data is analysed according to the 5 regional groupings shown in Figure 3. An analysis of the data for the year 1988 revealed several interesting differences in prescribing patterns between the Flemish speaking areas 1 and 2 and the French speaking areas of Wallonia, areas 4 and 5. Brussels, area 3, tended to show an intermediate prescribing pattern. In Wallonia, areas 4 and 5, the percentage of the total number of prescriptions written for products classified as hepatoprotective agents, preparations containing lactobacillus, vasodilators, vasoprotectors, potassium supplements and immuno-stimulants was between 50 and 100 per cent more prescriptions per year than in the Flemish speaking areas 1 and 2. Conversely in the Flemish speaking areas the percentage of the total number of prescriptions written for products classified as β -blockers, inhibitors of ovulation, bronchodilators, anabolic steroids, and immuno-suppressants was 50 per

cent greater than in Wallonia.

Less dramatic differences were also seen in relation to the number of prescriptions written for antispasmodics which was 25 per cent higher in Wallonia than in Flemish areas and conversely the number of prescriptions being written in the Flemish areas for antibiotics and insulin (there was no difference in the level of prescribing for oral antidiabetic agents) was greater than in Wallonia.

The association between the higher usage of β -blockers in the Flemish areas and higher usage of insulin may reflect the association between β -blockers and insulin resistance (Professor A Breckenbridge personal communication). It is always tempting to question whether or not the religious attitudes that affect medicine usage affect mortality. Do high users of medication have longer or shorter lives than non-users? In making international comparisons there are too many variables to achieve meaningful answers to these questions. What is needed is a comparison made from the same population. I know of only one such study, that of Simpson (1989) who compared the longevity in college cohorts in Kansas State. This study compared the longevity of 2,630 male and 2,928 female Christian Scientists who received a college education at Principia College with the longevity of a control population of 17,753 male and 12,105 female students who received a college education in the



College of Liberal Arts and Sciences at the University of Kansas in Lawrence. The study included the graduating classes from 1934 to 1983.

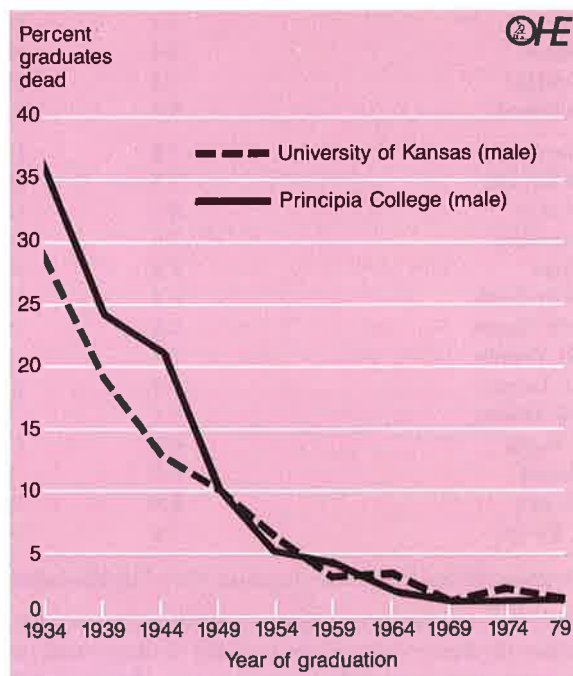
The cumulative death rate of Christian Scientists who received an undergraduate college education at Principia College in Elsah III, a liberal arts college for Christian Scientists, was compared with that of a control population that received an undergraduate college education in the College of Liberal Arts and Sciences at the University of Kansas in Lawrence. In the study the cumulative death rate is expressed as the percentage of the graduating class known to have died as of June 1987.

It was found that the graduates from Principia College had a significantly higher death rate than the control population from the University of Kansas.

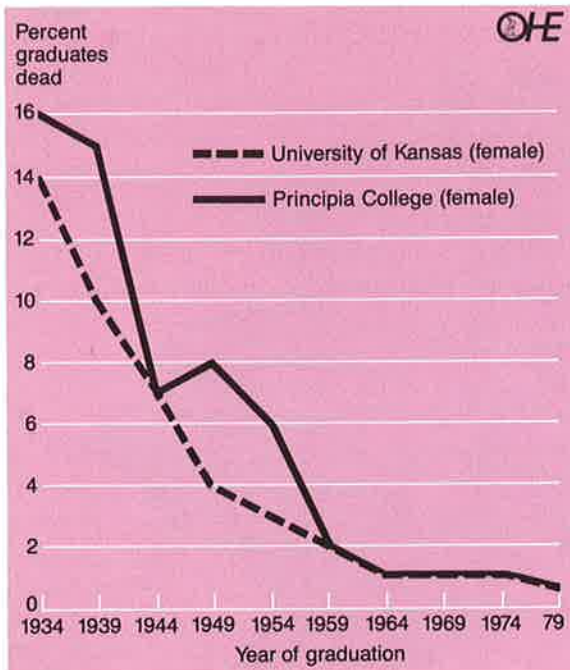
The data from Simpson's study is plotted for men and women in Figures 4 and 5. The excess mortality in Christian Science male graduates is apparent 30 years after graduation but shows up after 20-25 years in women.

It would appear that being a Christian Scientist has a negative effect on longevity overriding the positive health effects of abstinence from smoking and drinking. This negative effect would appear to be abstinence from medication since Mary Baker Eddy states a drug has 'no efficacy of its own but borrows its power from human faith and belief'. Christian Scientists behave in this respect like an extreme Protestant group.

4 GRAPH SHOWING EXCESS MORTALITY IN MALE CHRISTIAN SCIENCE GRADUATES



5 GRAPH SHOWING EXCESS MORTALITY IN FEMALE CHRISTIAN SCIENCE GRADUATES



GENERAL PRACTITIONER CONSULTATION RATES AND ETHNIC BACKGROUND

Turning now specifically to the situation in Britain, two studies by Gillam et al (1989) and Balarajan et al (1989) have examined the general practitioner consultation rates of different ethnic groups resident in Britain.

Gillam et al's study was conducted in a large group general practice in Brent with a list size of 10,877 patients and over a 23 month period ending April 1981 covered 67,197 consultations.

Compared with other ethnic groups, male Asians (that is including those born in Britain and those originating from the Indian subcontinent and East Africa) had a substantially increased standardised patient consultation ratio. However, consultation rates for mental disorders – in particular anxiety and depression – were reduced in all groups of immigrant descent. West Indians consulted more frequently for hypertension and asthma and their children less frequently with otitis media. Asians consulted more frequently with upper respiratory tract infections and non-specific symptoms. Perhaps more importantly it was found that native British patients were more likely to leave the surgery with a follow-up appointment, prescription, or certificate.

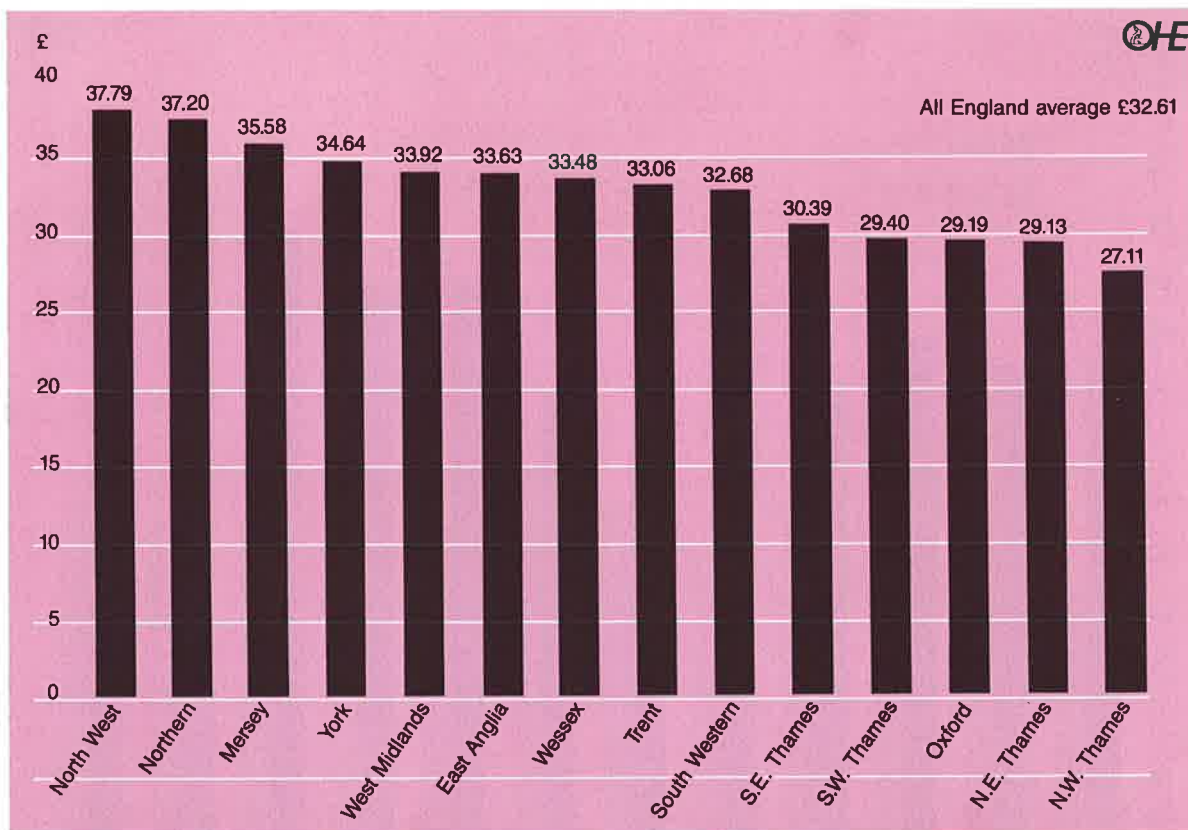
Balarajan et al's study was based on the British General Household Surveys for the years 1983-5 and included 63,966 people aged 0-64. Odds ratios were derived from

6 PRESCRIPTION ITEMS DISPENSED AND UNEMPLOYMENT, UK MID 1980s

Prescription items ^a dispensed, per head 1984 (NHS Regions)	% increase ^b items per head 1975-1984		Unemployment % total workforce mid 1985 (Standard Regions)	
England	7.2	12	England	13.4
Wales	9.4	13	Wales	16.5
Scotland	7.3	17	Scotland	15.5
N Ireland	9.4	23	N Ireland	20.7
Northern	7.8	17	North	18.8
N Western	8.5	18)	North West	16.2
Mersey	8.2	17)		16.2
Yorkshire	7.6	15	Yorkshire & Humberside	14.9
Trent	7.2	15	E Midlands	12.5
W Midlands	7.3	17	W Midlands	15.4
NW Thames	6.6	6)		
NE Thames	7.1	8)	S East	(10.6)
SE Thames	7.0	10)	(Greater London)	9.9
SW Thames	6.4	5)		
E Anglia	6.6	15	E Anglia	10.3
Oxford	5.9	8	S East/E Mid	c10
Wessex	6.8	10)		
S Western	7.4	13)	S West	11.6

^a Includes General Practitioner dispensed items; ^b chemist contractor dispensing

Note: Non-age standardised figures. Adjustment for age structure would increase the 'north/south' divide. Other relevant variables include the degree of urbanisation and inner city deprivation, regional income per head, and possibly the use of institutional as opposed to community services. In Scotland, for instance, hospital funding per capita is 30 per cent above the English average.



consultation by ethnic group by using logistic regression analysis adjusted for age and socioeconomic group.

The results related to people living in private households in England, Scotland and Wales. After adjustment for age and socioeconomic class, consultation among adults aged 16-64 was highest among men and women of Pakistani origin, these being three times and double those for white men and women respectively. Significantly higher consultations were also seen for men of West Indian and Indian origin (odds ratios 1.65 and 1.53 respectively). Ethnic differences were greatest at ages 45-64 when consultation rates in people of Pakistani, Indian and West Indian origin were much higher in both sexes compared with white people.

Both studies show that the ethnic composition of inner cities is likely to affect the work-load and case mix of general practitioners working in these areas.

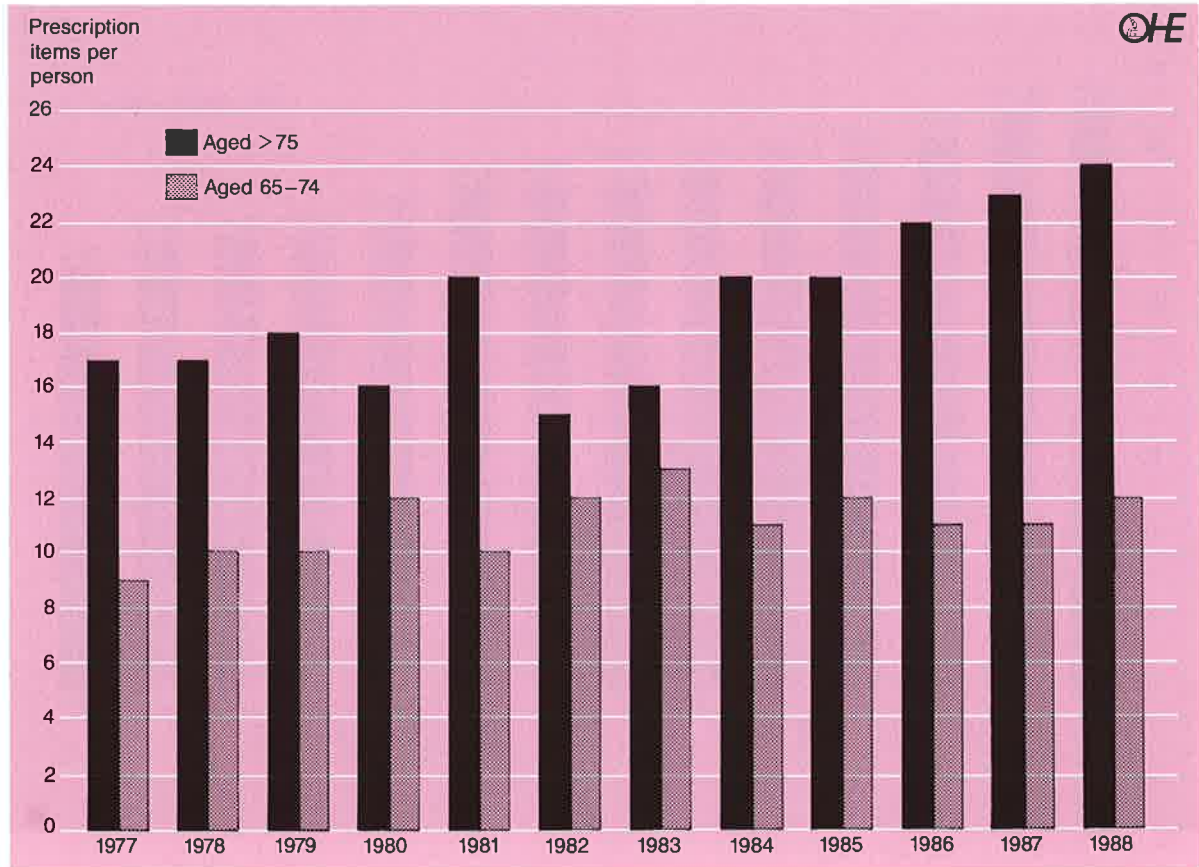
If the consultation rate reflected general levels of morbidity in the population and patient need for treatment then the observation in Gillam et al's paper that British patients were more likely to leave the surgery with a follow-up appointment and that standardised home visiting rates were significantly lower among Irish and West Indian patients needs elaboration; the obvious interpretation being very worrying.

UNEMPLOYMENT AND PRESCRIBING IN UK

There are wide variations between different regions in the UK in mortality and morbidity. There are also wide variations in regional prescribing patterns and a paper by Griffin, Taylor and Weber (1986) showed correlations between the percentage increase in prescriptions dispensed per head per year between 1975-1984 and the level of unemployment in mid 1985 (see Figure 6).

This paper showed, for example, that in 1985 the number of prescription items dispensed per head in the North West of England was 8.5 (the highest rate in the country) compared to 6.6 in the North West Thames area. The relative unemployment rates in that year were 16.2 per cent in the North West of England and 10.6 in the North West Thames area. For a regional increase of 2 per cent in unemployment, a corresponding increase in the number of GP prescriptions per head per year for that region of between 0.5 and 1.5 might be expected, the paper explained. More recent data confirms the validity of these findings. Data from the Department of Health (see Figure 7) shows that in 1987 the highest rate of prescribing was in the North West of England. (The unemployment in that area for 1987 was 13.45.) The lowest rate of prescribing was in the North West Thames area (which had an unemployment rate of only 7.5 per cent).

8 ESTIMATED PRESCRIPTION ITEMS PER ELDERLY PERSON, ENGLAND



The positive correlation between higher levels of unemployment and higher levels of prescribing could have been predicted from the findings of Beale and Nethercott (1985) who conducted a longitudinal study to investigate the consequences of unemployment on health. This study demonstrated a significant increase in family doctor consultation rates amongst the families of 129 workers (80 men and 49 women) made redundant when a factory producing meat products was closed in Calne, Wiltshire. A significant increase was also observed when the employees themselves were studied as a separate group.

The apparent decline in the health of employees and their families began two years prior to job loss, after the management first intimated that production might have to cease. In the following four years, the consultation rates in the study group compared to matched controls in the same general practices showed a highly significant 20 per cent increase; referrals to and attendances at hospital outpatient departments also rose. The results of Beale and Nethercott's study indicate that the threat of redundancy is a stress which is equal to, if not greater than, that of actual job loss.

Extrapolating the findings of Beale and Nethercott to the rest of the country (i.e. unemployment leads to a 20 per cent increase in general practitioner consultations and if it

is assumed that a constant 65 per cent of all consultations leads to a medicine being prescribed) then the impact of 2 million unemployed on prescription numbers, and indeed the NHS medicines bill, has been substantial. It should be borne in mind that this study was conducted in Wiltshire, which has a lower than average unemployment rate and chances of re-employment are greater than in less favoured areas of the UK, e.g. Northern Ireland. It would not be unreasonable therefore to regard the impact of unemployment as observed by Beale and Nethercott to be a low estimate when applied nationally. In this context, recent work by Moser et al (1986) on the effect of unemployment on mortality indicated that its impact is greatest in areas where unemployment is highest in absolute terms, i.e. chance of re-employment are lowest.

Mattiasson et al (1990) in a study on Kockums shipyard workers in Malmö, Sweden demonstrated that the risk of unemployment in middle aged men was associated with increases in serum cholesterol, the increase being more pronounced in those men with sleep disturbances. A positive correlation was found between change in cholesterol and increase in blood pressure indicating that the overall risk profile for cardiovascular disease had worsened in these men.

Brenner (1987) showed in a nine country study that increases in the unemployment rate and business failure have correlated with changes in heart disease mortality two to five years later. Mattiasson et al have indicated the possible mechanism for this increase in cardiovascular mortality.

AGE AND PRESCRIPTION DRUG USAGE

In a recent ABPI study it was estimated that the average person over the age of 75 years in the UK receives 24 prescription items per head per year. This compares with an average of 5.3 items for people aged 16-60 for women or 16-65 for men and 12 items per head per annum for the young elderly defined as women aged 60-74 and men aged 65-74 years (see Figure 8).

The projected growth (see Figure 9) in the British population over the age of 75 years and 85 years shows an alarming increase by the year 2031 and appropriate provision will need to be made.

SEX AND PRESCRIPTION DRUG USAGE

Women consult their doctors more often than men in the UK and are more likely to receive a prescribed medication. This is also true for the five Nordic countries, as shown in

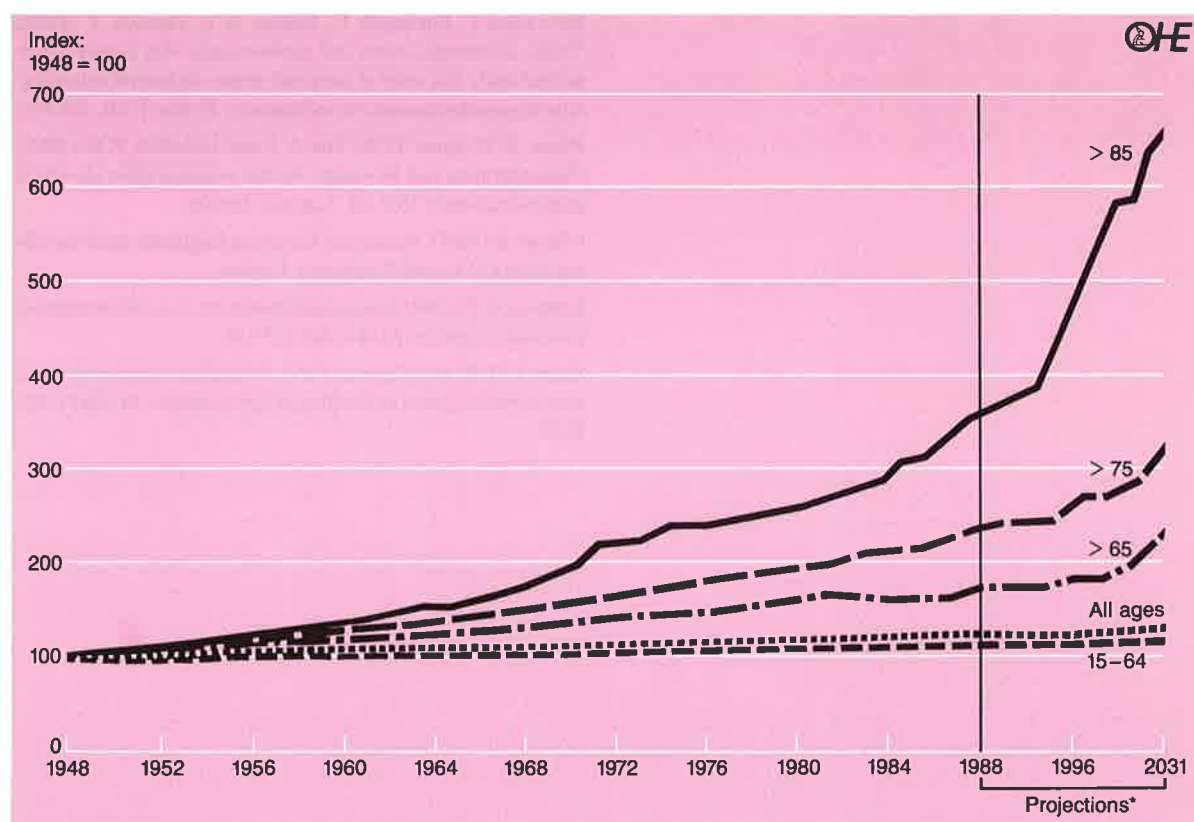
the report of the Nordic Council of Medicines 1987-1989 (Nordisk Läkemedels statistik (ref nlm 30)).

SCREENING FOR DISEASE IN GENERAL PRACTICE

Screening the population for certain diseases such as diabetes mellitus, hypertension, hypercholesterolaemia will identify new cases of these conditions in the population that will need treatment. Early diagnosis and treatment is known to be cost effective in the prevention of the late complications of these diseases. A recent OHE publication has indicated that if effective screening procedures for diabetes were to be introduced one new case of diabetes would be diagnosed for every one already known, that is the real incidence of diabetes mellitus in the community is double that which is currently under treatment.

A similar increase in the number of cases of hypertension would occur if regular screening programmes for high blood pressure were operated as part of primary health care in the UK. Smith and Clayton (1990) indicated that screening helped general practitioners to detect patients with raised blood pressure but that individual general practitioners seemed to adhere to their own criteria for labelling hypertension. In a study of 12 practitioners and 801 patients the

9 UK POPULATION AND PROJECTIONS



threshold level at which individual practitioners' decided to treat patients ranged from 103 mmHg to 116 mmHg diastolic and 173 to 206 mmHg systolic. In epidemiological terms these differences in criteria to treat hypertension could affect the number of newly diagnosed hypertensive patients needing treatment several fold. A reasonable base level to commence treatment would generally be accepted as three successive readings on different occasions of systolic BP over 160 mmHg and diastolic over 100 mmHg.

CONCLUSION

Differences in consultation levels and prescribing are affected not only by age and sex but by social factors within the community such as religion, race, and level of unemployment, age and sex. It should be stressed that these factors are independent variables from the regional distribution of disease in the community.

To take steps to regulate social behaviour patterns that are influenced by such delicate factors and to interface in professional judgements is to invite political acrimony.

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PATTERNS OF PRESCRIBING

George Teeling Smith

I would like to present some data from the VAMP market research organisation. They are one of the two companies which have been giving computers to general practitioners in return for obtaining data from them. The data that I am giving in the first set are from 108 practices which VAMP regard as being their 'research practices', where they are confident that the quality of the data they are obtaining from those practices is sufficiently reliable to be able to use it for statistical analysis. I am simply presenting figures; I will make the minimum comment. I will leave you to make your own interpretation.

Figure 1 shows the spread of prescribing: average prescriptions per quarter per patient for the 108 practices – not by individual general practitioner. You can see that the prescriptions from one quarter, if turned into annual figures, range from about 2.25 prescriptions per year per patient at the bottom to 12 per patient per year at the top; there is a very good grouping around the centre, but a fivefold variation between the extremes. The average number of prescriptions is what you would expect, which is about 6 per year. These figures have no great surprises for us therefore.

Figure 2 shows the same data, corrected marginally for age of patient. This is per prescribing unit, where an elderly patient has a 2:1 loading in order to correct for the heavier use of medicines among elderly patients in the practice. VAMP are now using a 3:1 factor, but the figures I am showing give a correction of 2:1. This very marginally

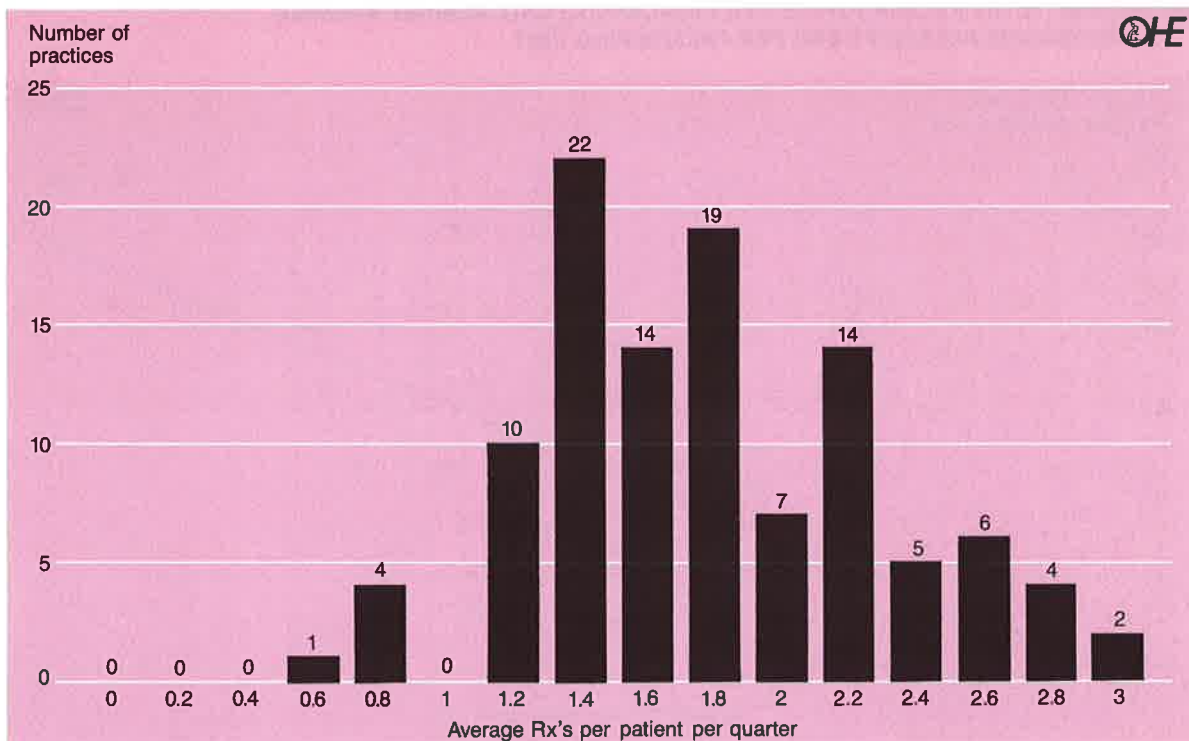
reduces the overall spread of prescribing, but it still is more or less a fivefold variation.

I really want to talk about two sets of prescribing: the first is for hypertension and the second is for diabetes. Figure 3 relates the overall prescribing of doctors to their prescriptions for hypertension. This is a classical scatter diagram, showing an enormous spread between the lowest prescriber and the highest prescriber. The horizontal axis gives the total prescriptions: vertically the prescriptions for hypertension, showing a similar variation. One practice apparently sees very little hypertension; another sees a very high proportion.

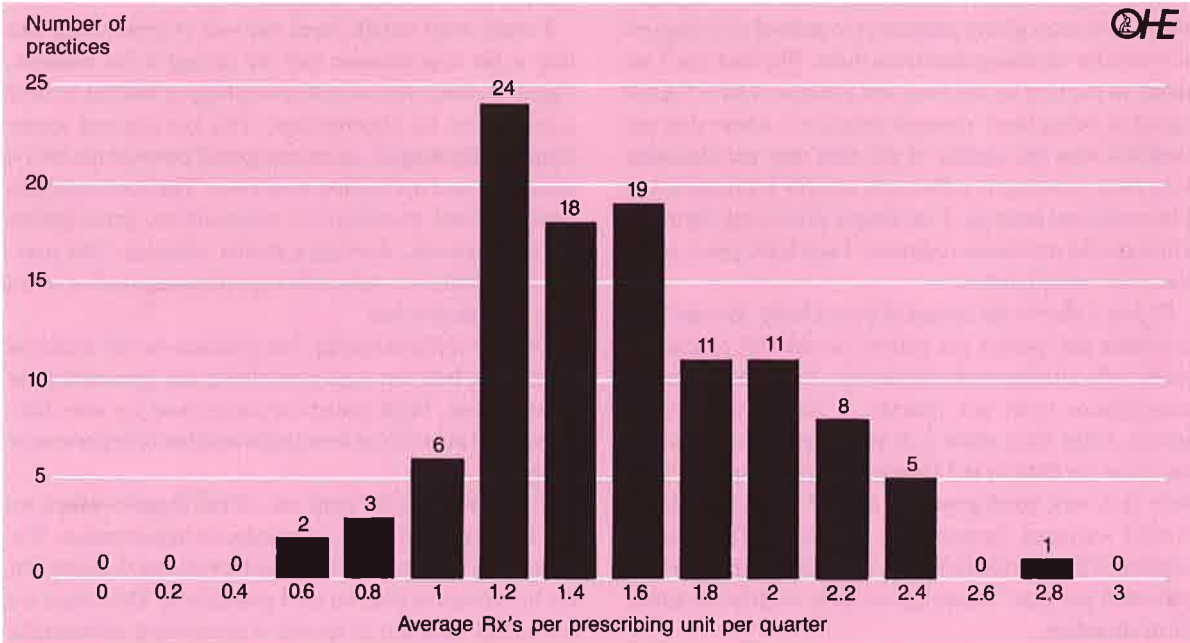
There is random spread, but a strong overall statistical correlation between total prescribing and prescribing for hypertension. High prescribers in general are also identifying and prescribing for a larger number of hypertensive patients.

Figure 4 shows the same sort of bar diagram which we saw for total prescribing, in relation to hypertension. The interesting thing is that the spread is very much greater for the hypertension than for total prescribing. Here there is a fifteenfold variation in spread of prescribing between the lowest and the highest. These are prescriptions for hypertension once again per quarter. You multiply by four to get the annual prescriptions. If you assume that the prescriptions are for a month's treatment each, this leads to a conclusion that the extreme lowest prescriber is prescribing for about 1 per cent of their patients for hypertension, and

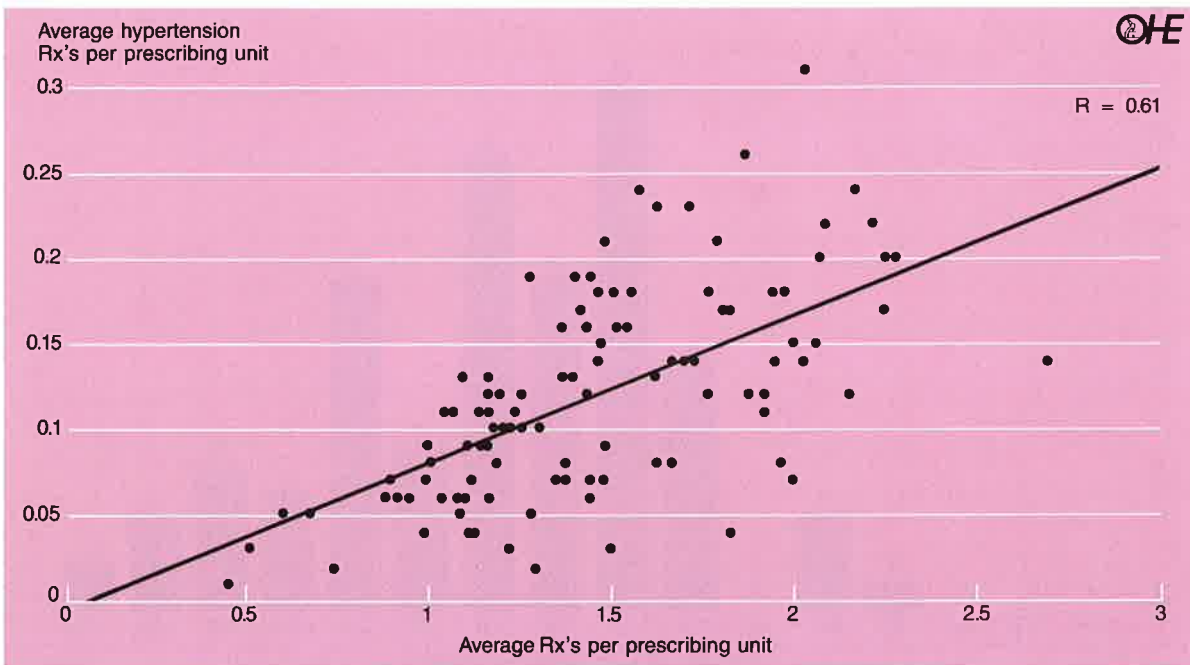
1 AVERAGE NUMBER OF PRESCRIPTIONS PER PATIENT PER QUARTER

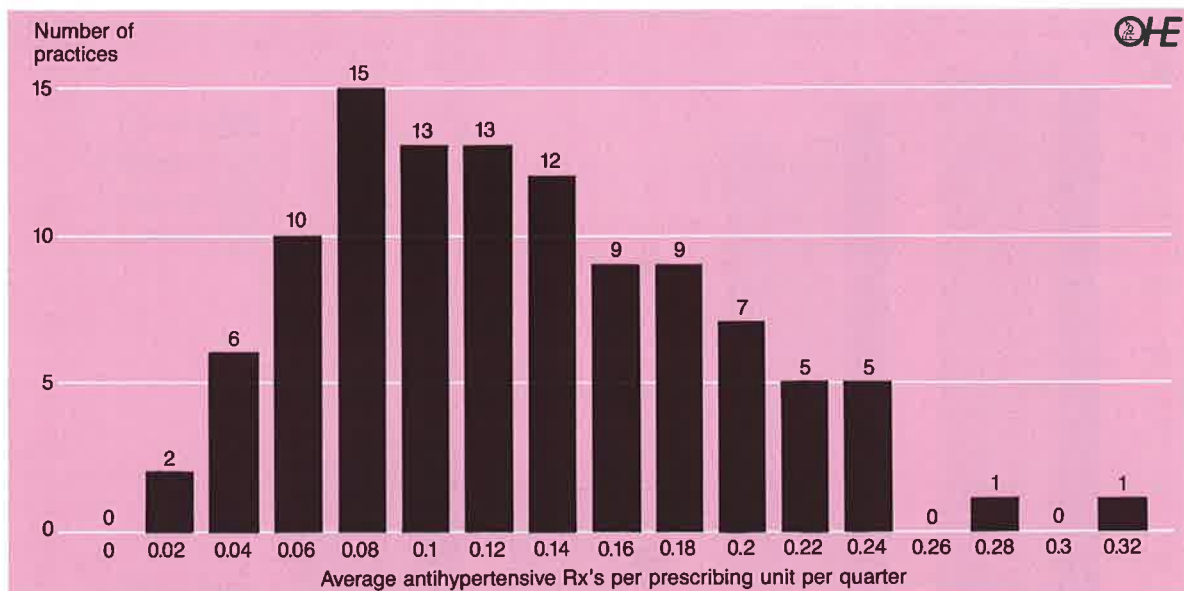


2 AVERAGE NUMBER OF PRESCRIPTIONS PER PRESCRIBING UNIT PER QUARTER



3 AVERAGE TOTAL PRESCRIPTIONS PER PRESCRIBING UNIT AGAINST AVERAGE HYPERTENSIVE PRESCRIPTIONS PER PRESCRIBING UNIT





the highest practice is prescribing for about 15 per cent of their patients for hypertension.

In Donald Crombie's 1981-82 general practice data the overall rate for hypertension was 3.7 in the average practice this compares very well with the VAMP data which comes out with the average prescribing as about 3 to 4 prescriptions. Thus, the VAMP data are compatible with the Royal College of General Practitioners' data.

Trying to interpret these data, they suggest that the lowest prescribing practice is prescribing for about one in four of the hypertensive patients that the average practice is prescribing for. If you accept that the true prevalence of moderate to severe hypertension – that is, a diastolic pressure of over 110 – is probably nearer 6 per cent it means that the lowest prescriber is prescribing for one in six of the true hypertensives in the community. At the other extreme, doctors are prescribing for two patients for every one with severe to moderate hypertension; that is, they are treating the mild to moderate hypertension as well as more severe cases. They are giving prescriptions probably for more or less everybody in their practice with a diastolic pressure of above 100 mm of Hg. So that may be the range. It is a quite remarkable range, which will give us some food for discussion. It is of course possible that a part of the variations may occur due to differences in the size of the prescriptions. We shall see the effect of this in diabetes.

Figure 5 answers a question which John Griffin asked when he saw these data. He asked: 'What sort of prescribing are the high and the low prescribers doing?' Last week I got the answer from VAMP to that question, which I find even more fascinating than the spread. What VAMP did was to divide total prescribers into quartiles: low prescribers, moderately low prescribers, moderately high pre-

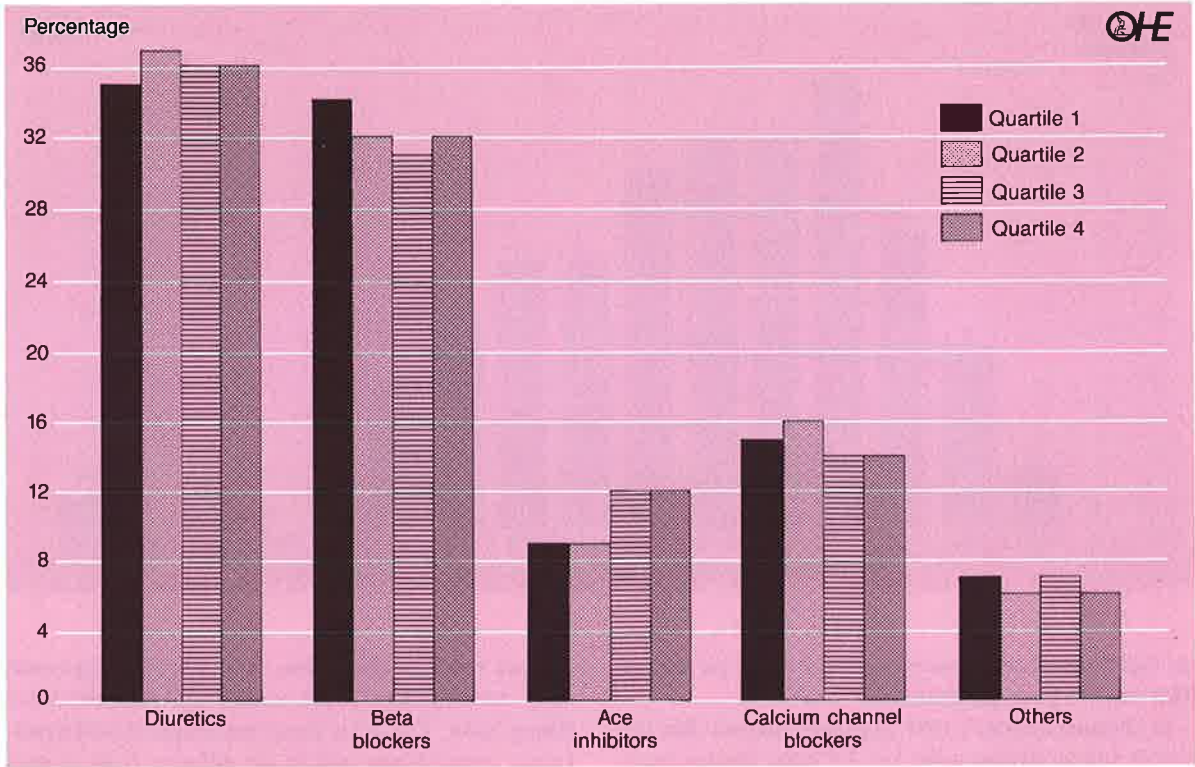
scribers and high prescribers. The quartile points come fairly close together, as you would expect from the distribution curve. The figure shows percentage of total hypertensive prescriptions written for different types of anti-hypertensive in each of the prescribing quartiles for the high and the low prescribers. With the exception of a small trade-off – between ace inhibitors and calcium channel blockers – between high and low prescribers, there is an almost uniform pattern of prescribing. Whether a practice is prescribing a large number of medicines or a small number of medicines, they are still prescribing the same breakdown by type of hypertensive.

Between 30 per cent and 40 per cent of total hypertensive scripts were for diuretics in each group of practices; between 30 per cent and 40 per cent of all the hypertensives in those practices were beta-blockers, and about 10 per cent each were for calcium channel blockers and for ace inhibitors.

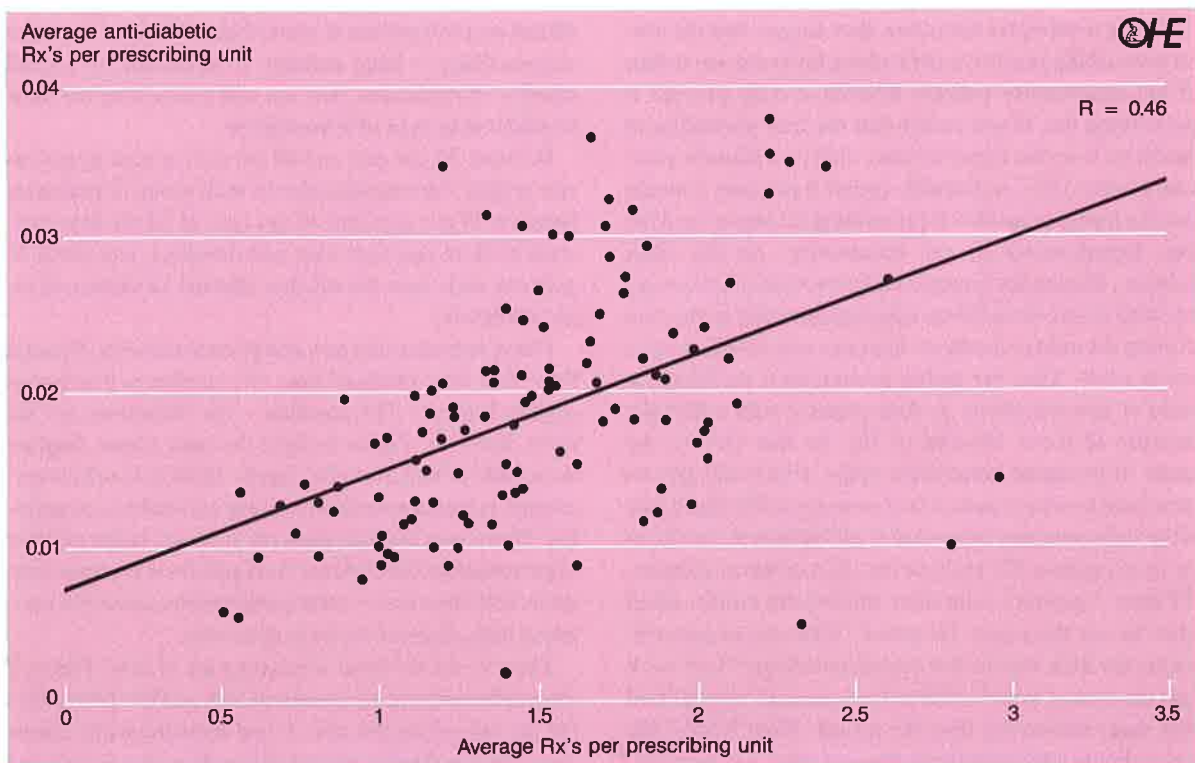
I leave hypertension now and go on to diabetes. Because these data were obtained later, the number of practices is slightly higher – 114 practices – the definitions are the same, however. Figure 6 shows the same scatter diagram as we saw for hypertension. Again, there is a positive correlation between overall prescribing and diabetic prescribing. On average the high prescribers write a larger number of prescriptions for diabetes, but again there is a huge scatter in both directions – total prescriptions across the horizontal axis; diabetes on the vertical axis.

Then to me the most fascinating set of data: Figure 7 shows a breakdown by quartile of high and low prescribers for the rate of insulin and of oral hypoglycaemic agents prescribed in the four groups of practices; that is, low and high prescribers. You see an absolutely uniform pattern of

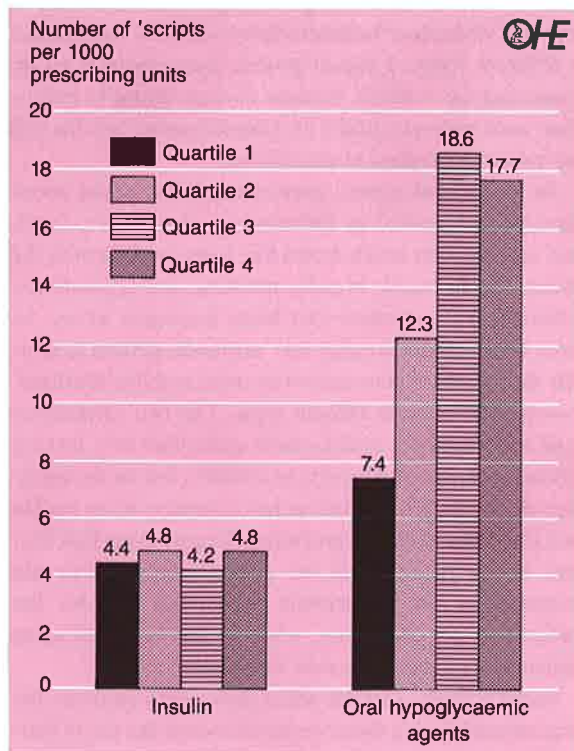
5 PERCENTAGE DISTRIBUTION OF ANTI-HYPERTENSIVE PRESCRIPTIONS IN QUARTILES



6 AVERAGE ANTI-DIABETIC PRESCRIPTIONS PER PRESCRIBING UNIT AGAINST AVERAGE PRESCRIPTIONS PER PRESCRIBING UNIT



7 AVERAGE NUMBER OF ANTI-DIABETIC 'SCRIPTS PER PRESCRIBING UNIT PER QUARTER



prescribing for insulin, regardless of whether the practices are high or low overall prescribers. They prescribe the same rate of insulin prescriptions. There is an overlap between early onset insulin-dependent diabetes and late onset non-insulin-dependent diabetes; but these data suggest to me that the doctors are virtually unable to miss early onset insulin-dependent diabetes and that they are seeing exactly the same rate of insulin-dependent diabetes whether they are a high prescribing practice or a low prescribing practice. When it comes to late onset non-insulin-dependent diabetes, however, there is the same spread between low prescribers and high prescribers as we saw for hypertension. High prescribers are writing two and a half times as many prescriptions for oral diabetics as the low prescribing practices.

Interestingly, based on data which we have but which I have not shown, this suggests – presuming the higher rate of prescribing is better in that it represents the treatment of a higher proportion of actual cases – that the third quartile of practices appears to come out the best. The data for hypertension also indicate that in that case the third quartile appears to have the highest rate of anti-hypertensive prescribing. That is, doctors who are high prescribers – but not very high prescribers – are treating the highest proportion of diabetics and hypertensives.

Because we knew more of what to ask for from VAMP

in the second set of data, Figure 8 although it is less dramatic provides much harder data of what is actually happening in diabetes. We did not know to ask for this in hypertension. This figure does not show numbers of prescriptions but numbers of patients. Here you see exactly the same pattern: for patients treated with insulin it is 2.2 per thousand prescribing units, uniform across the four quartiles of low prescribers and high prescribers. Coming down to the third line of the figure, for patients treated by diet alone, there is again a completely uniform pattern across the four groups of prescribers. There does not appear to be a transfer between treatment by diet alone and by oral hypoglycaemic agents. The higher rate of treatment of non-insulin-dependent diabetics – less dramatic but still absolutely clear-cut – still occurs in high overall prescribers. It is clearly these high prescribers who are identifying larger numbers of diabetic patients with late onset diabetes, which we know is more difficult to detect. The high prescribers are detecting or treating a higher rate than the low prescribers, and they are not substituting oral antidiabetic agents for insulin or for diet.

Looking at the total prescribing rates for total patients, without the correction to prescribing units, the ‘best’ total rate of prescribing for diabetes comes out at about 13 per thousand. We think, if John Butterfield’s estimate is correct, that this probably compares with a true prevalence of diabetes of about 20 per thousand. He thinks that there are more than a million diabetics in the country – that is 2 per cent of the population. We are therefore still getting under-treatment rather than over-treatment – even at the highest level. That is the only comment that I would make on these data, which I personally find quite fascinating.

8 NUMBER OF DIABETIC PATIENTS AND PREVALENCE PER 1000 PRESCRIBING UNIT (PU)

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Patients treated with insulin (Prevalence per 1000 PU)	435 (2.2)	352 (2.4)	291 (2.2)	243 (2.2)
Patients treated with oral hypoglycaemic agent (Prevalence per 1000 PU)	648 (3.3)	690 (4.8)	765 (5.8)	631 (5.7)
Patients treated with diet alone (Prevalence per 1000 PU)	829 (4.2)	637 (4.4)	545 (4.1)	495 (4.4)
Total prescribing unit (Total prevalence per 1000 PU)	196,764 9.7	144,069 11.7	132,131 12.1	111,359 12.3

PATTERNS OF PRESCRIBING

Conrad Harris

18

It is widely believed that all general practitioners, having armed themselves for the therapeutic fray with their trusty pads of FP10s, are then spurred on by the brave cry of 'Excelsior', so that each and every prescribing variable surges ever upwards and onwards, to victory or death. The statistics that are given publicly support this belief – like the one about the cost of prescribing having doubled, in real terms, between 1977 and 1987 – and indeed it is not difficult to find figures of this sort. The truth is more complicated and more interesting, though very little of it is yet known. In this paper I shall be offering you some facts, some deductions from them, and some opinions; and I shall try scrupulously to indicate which is which.

Let me begin with two major events that have taken place in the last 5 years: the imposition of the Limited List – later renamed the Selected List – in April 1985, and the start of the feedback system called Prescription Analyses and Costs (PACT) in August 1988. I find it instructive to compare what happened after they were each introduced.

The imposition of the Selected List was, I believe, primarily a political event. The broad changes that took place subsequently were small and transient; before the end of the year, the numbers and costs of prescriptions were growing as rapidly as ever. PACT, on the other hand, I see primarily as an educational event. Within a short time of its introduction the steady increase in the number of prescriptions was dramatically reduced, and after 18 months it shows no sign of turning upwards again; the cost of prescriptions has actually begun to fall, in real terms.

These facts have been given no publicity, which seems to me to be a shame; and though there is no proof of a cause and effect relationship between the events and what occurred after them, I can find no reason not to draw the obvious inferences.

The next event will be the introduction of drug budgets, but by then it will be even more impossible to tell which factors are the most important in determining the patterns that emerge.

The number of prescriptions is continuing to grow, even if less rapidly than before, and this is surely the aspect of prescribing which should receive most attention. In 1987 the number of items per head of the population, on average, went above 7 for the first time; in 1989 it reached $7\frac{1}{3}$. There are figures which suggest that the increase in recent years has been chiefly due to more prescribing for the elderly, and though there will undoubtedly be benefits, the growing numbers of elderly and the rising cost of the drugs prescribed for them mean that there are financial implications that cannot be ignored. In some general practices repeat prescriptions account for more than half of all prescriptions, and since many surveys have shown that repeat prescribing is mainly for the elderly, we need a thorough review in all practices of repeat prescriptions if we are even to hold back the tide for a while.

Generic prescribing, after many years of immobility,

became more common as a result of the Selected List in 1985. This may have given a little relief to the Treasury, but it would be hard to argue that patients benefitted in any way when their benzodiazepines came to them under a different name. I expect generic prescribing to go on increasing for a while, because doctors trying to reduce their costs will often find it the simplest route, but this will not raise the standard of prescribing.

As you would expect, prescribing has a strong social dimension, signalled by differences in the patterns north and south of that much drawn line from the Severn to the Wash. To the north, broadly speaking, prescriptions are relatively less expensive but more frequently given. In finer focus we can see that this 'northern' pattern is actually the pattern of poor industrial areas, and the 'southern' pattern that of more affluent areas. The two variables of cost and frequency could cancel each other out, leaving overall costs similar all over the country, but on the whole they do not: larger numbers of less expensive items tend to cost more than fewer, dearer ones. We may guess that doctors in the poorer areas are giving symptom-relieving preparations on prescription when this enables the patients to get them free, while in the better-off areas patients buy these drugs over the counter.

Social attitudes can also affect prescribing patterns, the best example being the pressure to reduce the use of benzodiazepine tranquillisers. The number of prescriptions for these drugs is now only half what it was in the late 1970s.

Hypnotics, also mainly benzodiazepines, have not shown the same fall, and neither have antidepressants. Again it seems surprising that the good news about tranquillisers has had no publicity.

There is not much more to our knowledge about national patterns, though of course the drug firms have their own closely-guarded secrets, and the Department of Health has figures about individual drugs that are confidential because of their commercial value. Tantalisingly, the data held by the Prescription Pricing Authority are a goldmine waiting to be excavated, and I am delighted that the Department of Health is making it possible for me to start digging.

We know that one practice in 12 is classed as high cost overall by the 25 per cent rule, but we have no idea whether such practices are distributed randomly or not. We know that about one in 24 is additionally defined as high cost for its use of certain groups of drugs by the 75 per cent rule, but we do not know which of the drug groups is most prescribed, or where or why. The very figures 25 per cent and 75 per cent are entirely arbitrary, and it would not be difficult to establish if some other percentages would be more sensible.

We do not know if the association of socio-economic factors with different prescribing patterns I referred to earlier holds up within Family Practitioner Committee (now

known as Family Health Service Authority) areas too. If it does, it should be possible to suggest better yardsticks for budget-setting than the area averages which are all that Family Practitioner Committees have available at the moment.

Exploring the interplay between prescribing and the major demographic variables should lead to a greater understanding of existing patterns and make us better able to forecast and plan the best use of our resource.

I want to turn to emerging situations and ideas which may affect prescribing, and from here on there are no facts to present: I have just my own opinions.

The first issue to consider has to be the managerial responsibility vested in the Family Practitioner Committees from 1991. My thoughts about Independent Medical Advisers are quite similar to those of Rabbit about Owl in one of the Winnie the Pooh stories – ‘You have to respect anyone who can spell TUESDAY – even if he spells it wrong’. As I see it, Independent Medical Advisers cannot get it right, since their terms of reference – up to now anyway – are being deliberately fudged. They cannot push the cost aspect too far, because this would be ethically and politically unacceptable, and they will not be able to go very far with standards of prescribing because they will not be given the expensive resources that this would require. I am sure that they will work very hard and at times do things that are worthwhile, but I do not see them having any significant effect on prescribing patterns. Political incursions into this field are doomed to failure unless they introduce compulsion and painful sanctions. The way forward lies elsewhere.

Screening for, and monitoring of, chronic diseases will have a major impact on prescribing. We do not yet know the scale, but I did have a chance recently to look at the PACT reports of a few practices with a special interest in asthma and offering exceptional care to their asthmatic patients. In all other respects their prescribing seemed pretty typical of their Family Practitioner Committee areas, but their costs for respiratory drugs were up to 100 per cent higher. It seems silly to ask if they are goodies or baddies, but if they are goodies should we not be concerned to identify the very low cost practices and be spurring them on to be more expensive? There are enough chronic illnesses and preventive measures to allow us already to say that no amount of downward managerial pressure will be able to keep the lid on costs.

What then of the formularies that are so fashionable at the moment? Do they offer any salvation? Everything we know about human nature tells us that where a formulary enshrines the considered views of the doctors using it, it has a good chance of working; when it arrives in the post, unsolicited, it has not. Nothing but good can come of small groups of doctors sharpening their knowledge and weighing their choices of the drugs available to them, but putting a few doctors and a few pharmacists together to make policies

for a whole area is a waste of time – especially as there are a few good general practice formularies on the market already.

This is not to say that there is no scope for activities wider than one practice. There should always be a mechanism whereby microbiologists can give local feedback about antibiotic-resistant pathogens, and it would be a great step forward if general practitioners and consultants could get together to agree on some management protocols. It is nothing to be proud of that these kinds of communication and collaboration are not already in place everywhere.

The pharmaceutical industry is, quite reasonably, very worried by some of the things being said about formularies – that, for instance, they should not include any drug that has not proved its worth in the market for 5 years. It does not take much imagination to see where this would lead.

Finally, let me say a little about the government. You will have gathered that I am not happy about the attempts to influence prescribing patterns directly, but I do think that the government has an important part to play which up to now it has not taken. From the perspective of general practice it seems as though government approves new drugs for use, agrees what they will cost and then retires from the scene until the point where it pops up to slap the wrists of the doctors who use them. This is not good enough.

Ten years ago I was able to show that doctors would alter their prescribing behaviour if they were given feedback about what they were doing and time to discuss it, and this is the model for motivating professional improvement to which I still adhere. We now have in PACT much of the feedback we need, though it could be improved, but less time in which to discuss it.

We still have nowhere near enough clinical pharmacologists to give therapeutics the emphasis it should have in the undergraduate curriculum, and it looks as though we need a spur to encourage the setting up of local structures to encourage communication between hospitals and general practice about local circumstances – handled within the profession rather than through the management bodies.

Given that the costs of new drugs will increase and that the pressures to prescribe them will not diminish it seems quite evident to me that we have to develop a strategy broad enough to contain them. It must look beyond feedback, beyond clinical pharmacology, beyond formularies and beyond Independent Medical Advisers and management structures, because these all operate at the level of isolating prescribing from its context. Prescribing cannot improve very far in a vacuum – it is after all no more than one of the transactions between doctors and patients, and these in turn are part of a more general culture.

The terms of the strategy we need are simple, though their implications may be very large: they are nothing less than a major reduction in all prescribing. It is thought that

about 80 per cent of consultations now result in a prescription, and we should be aiming to halve this figure. The immediate responsibility for doing so lies with doctors, but there is much that the government could do to help. First we must recognise that there are ways of making patients believe that we are taking their problems seriously which do not involve a prescription. Some of them require time – time to talk, time to examine and time to think; some require training; and some require additional resources inside or outside the practice. All may be more expensive than a prescription. Secondly we need a public with a better understanding of the dangers and limitations of drugs, and this demands an educational process which begins in the primary schools and receives continual reinforcement thereafter.

If you think I am asking for the moon, my answer is that this is the price of good medicine and good prescribing. If it is not paid, we will not get them.

Alastair Hepburn

From 1987, with the appearance of the White Paper 'Promoting Better Health', I was one of two RMOs (Regional Medical Officer) who were given regional roles and my job in Yorkshire was to visit doctors throughout the seven Family Practitioner Committees (FPC – now known as the Family Health Service Authority) to discuss prescribing matters with them. During the two years I was in post I visited about 200 practices in total. The work was largely educational in nature and was not, by and large, disciplinarian. Now we are at the stage where FPCs have taken over the role of encouraging effective prescribing and they are doing this from 1 April.

From last April I was attached to Leeds FPC on secondment, one day a week. Leeds was one of seven FPCs that volunteered their services to run pilot studies on prescribing prior to their new role on 1 April. Essentially, the study was to find out how the FPC might utilise the wealth of data from the PPA (Prescription Pricing Authority) which they received (Figure 1).

The Leeds report is available for any of you who would like to see it, directly from the FPC. It is only possible to mention briefly the objectives of this pilot study in the time and space available (Figure 2 shows the chapter headings).

We received PACT (Prescription Analyses and Costs) data both for practices and for the FPC. Just to remind you, level 1 for practices shows prescribing costs, the frequency of prescribing and the average cost per item. If we

1 THE INFORMATION FAMILY PRACTITIONER COMMITTEES CURRENTLY RECEIVE FROM THE PRESCRIPTION PRICING AUTHORITY.

1. Quarterly statistical data for doctors in the FPC area (PD2), this lists practices alphabetically and includes list size, number of items prescribed, cost, prescriptions (FP10) per person and per prescribing unit (PU), net ingredient cost (NIC) per person and PU. Practice variation from the FPC is also included. (Each patient under the age of 65 is allotted one prescribing unit and those aged over 65, 3 prescribing units).
2. Prescribing Analyses and Costs (PACT) information at 3 levels every quarter. The basic level compares the overall cost of the FPC with a national average. The total cost and both of these parameters are tabulated. Amongst other information included in the report is a breakdown of prescribing by therapeutic group and percentage generic prescribing. Levels 2 and 3 give increasingly detailed information, the last including the quantity and number of prescriptions for every drug prescribed in the quarter. This is divided into chapter headings corresponding to those in the British National Formulary.
3. General practitioners receive similar information about their practice prescribing which is compared with both the FPC and the national average. Level 3 is available only on request and currently about 10 per cent of general practitioners send for this information. FPCs will be able to request practice based PACT data from 1 April 1990.

2 REPORT OF THE LEEDS FPC PILOT SCHEME – CHAPTER HEADINGS

1. A comparison of FPC expenditure with national and regional figures as well as similar FPCs.
2. An example of the spreadsheet that was formulated.
3. A prescribing analysis of high cost practices.
4. Prescribing analysis of training practices.
5. Prescribing in different medical practice classification areas.
6. Excess therapeutic groups.
7. Practice visits.
8. Hospital shifted prescribing.
9. The Leeds Prescriber bulletin.
10. Potential cost savings without detriment of patient care.
11. Prescription Pricing Authority and computer implications.
12. Prescribing: Can the FPC cope?

look at the FPC as a whole we go back to what Dr J P Griffin mentioned: that in the northern regions one tends to see a higher frequency of prescribing and a lower cost per item. This is borne out in Leeds.

Currently the expenditure in Leeds FPC is in the region of £704,000 per quarter. This is 10.5 per cent above the national average and is due to increased frequency of prescribing (+12 per cent) though net ingredient cost is 1.3 per cent less than the national average. The average cost over the five quarters was £7.5 million. This is divided amongst 140 practices.

If we look at PD2 (Prescribing Data 2 – produced by the Prescription Pricing Authority every quarter for each FPC – it includes data such as the number of prescriptions per patient, and the cost per prescription within the FPC). There is a large variation in costs between practices. The highest spends some £30 per patient per quarter whilst for those at the lower end the cost is approximately £5. However, the latter are not typical general practices and there are usually special circumstances for their low costs, for example a student population. The study revealed that practices are remarkably consistent in their prescribing patterns and vary very little from one quarter to the next.

Looking at an FPC area as a whole, however, can be slightly alarming and also misleading. What I did in Leeds was to subdivide the FPC into smaller areas, using medical practice classification areas so that one had more chance of comparing like with like: practices in similar areas with similar environments and similar patients. An in depth analysis was undertaken of 32 practices (71 general practitioners whose costs over the year averaged more than 10 per cent above the average for the FPC).

Summarising the high cost data (Figure 3), we come up with various facts:

- (1) most had an average list size;
 - (2) most had an average number of elderly patients;
 - (3) average generic prescribing was the norm;
- however, there was

3 ANALYSIS OF 32 PRACTICES (71 GPs) WHOSE COSTS OVER THE YEAR AVERAGED MORE THAN 10 PER CENT ABOVE THE AVERAGE FOR THE FPC.

1. Average list size compared with the FPC.
2. Average number of elderly patients.
3. Average generic prescribing.
4. Increased prevalence of single handed doctors.
5. Over representation of non-UK qualified graduates.
6. Less than expected number of female doctors.
7. Increased frequency in the majority of therapeutic groups.
8. Almost 50 per cent had increased net ingredient costs in four or more therapeutic groups.
9. 25 out of 32 had excess cardiovascular system costs, 24 out of 32 had excesses in central nervous system, respiratory system and musculoskeletal groups.
10. 60 per cent have increased frequency in 6 or 7 therapeutic groups.
11. The excess cost was £4,172 per GP per quarter.

(4) an increased prevalence of single-handed doctors;
and

(5) an over-representation of non-UK qualified graduates.

Point numbers 4 and 5 to a certain extent can be bracketed because the two often go hand in hand.

There were a less-than-expected number of female doctors and an increased frequency in the majority of therapeutic groups. Nearly half of those practices also had increased net ingredient costs in 4 or more therapeutic groups. Many of these doctors were therefore tending to prescribe more expensive items as well as more frequently.

Cardio-vascular system was the therapeutic group with the greatest excess costs, which may well be a good thing; 24 out of 32 had excess central nervous system costs – which may be less of a good thing – and 60 per cent had increased frequency in 6 or 7 therapeutic groups. Looking at the figures from the pounds, shillings and pence point of view, the excess was about £4,000 per general practitioner per quarter.

Moving off the doctors on to the drugs. Over 5 quarters it was possible to establish trends in prescribing for both individual drugs as well as therapeutic groups. The Level 3 PACT data that FPCs receive gives a complete breakdown of all the drugs prescribed in the previous quarter.

In looking at drugs which may have some social impact, for example benzodiazepines, and Lorazepam – one can get some measure of the use of any drug from the Level 3 data by a very simple calculation: dividing the population by the number of FP10s. This will give you a crude figure of the number of FP10s per person.

It is interesting to note that in Wakefield, Yorkshire one out of every 102 patients receives a prescription for Lorazepam which is double the number in Kirklees which borders Wakefield – why this happens I do not know. But this work will be taken up probably at regional level when

we look at other drugs, including benzodiazepines, to see why there should be this big variation.

Prescribing of Temazepam over the 5 quarters I examined showed very little change, but the usage is one prescription per 30 of the population. That is a lot of hypnotics. Diazepam has fallen about 10 per cent during the year, and Lorazepam has decreased by 20 per cent.

I looked at drugs of perhaps more therapeutic value (and certainly with major cost implications) – ace inhibitors, clearly one of the growth drugs of the decade. The number of FP10s has risen by 43 per cent over the year. This clearly has major cost implications. The cost has gone up from £137,000 to £193,000. When drug budgets are being set, factors such as growth in the use of ace inhibitors and modern therapies would have to be taken into account by those who are setting the budgets.

The same thing has happened with lipid lowering agents. Again their cost has almost doubled over the year. Once again there are budgetary implications.

Another pilot scheme reported that the general practitioners themselves were the most important variable when considering prescribing costs. I think that there is very little doubt about this. It certainly has been shown up in my work in Yorkshire amongst the 7 FPCs where I have been monitoring the prescribing.

I would agree with Professor Conrad Harris on the fact that prescribing data must not be taken out of context. It should be used as part of a general audit process in general practice. The other plea is that practices should be looked at individually, because each varies from its neighbour; each has a different group of patients, a different set of problems and probably doctors with different perceptions and attitudes to prescribing. Rather than looking at an area average, therefore, one has to look at individual practices *per se*.

PATTERNS OF HOSPITAL REFERRAL

David Wilkin

At a meeting also organised by George Teeling Smith four and a half years ago at the CIBA Foundation, Sir Donald Acheson talked about variations in referral to hospital by general practitioners. On that occasion he presented a graph which was derived from our own Manchester data, and which showed variations in the rate of referral amongst 199 general practitioners in Manchester, Salford and Trafford. Sir Donald expressed concern and frustration that an apparent 25 fold variation in rates of referral could not be explained.

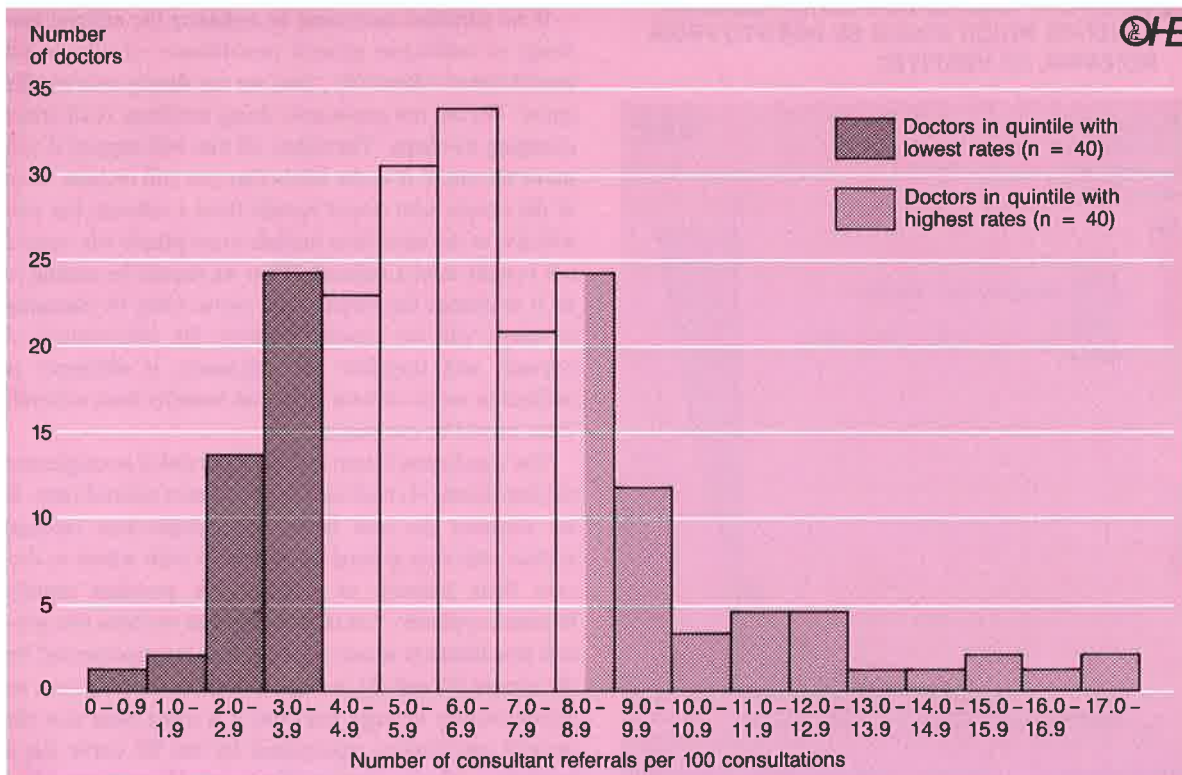
Following Sir Donald's paper we carried out extensive additional analyses on our own material. Rather than looking at the extremes of the spectrum, we identified top and bottom quintiles of the referral rate distribution (Figure 1). The hatched areas at either end of the graph represent low and high referrers; the mean referral rate per hundred consultations for low referrers was 2.9, and the mean for high referrers was 11.8. This suggests that we are talking about something like a fourfold variation, rather than the 25 fold variation sometimes mentioned. We will probably have to wait for the data from the East Anglian Referral Rate Project before we have a very accurate estimate of what the extent of variation really is, but I doubt whether anybody would disagree with the statement that there is probably at least a fourfold variation in general

practitioner referral rates to hospitals.

What conclusion can we draw from this? Some people within the Department of Health drew the conclusion that there must be a problem. Given such a wide variation in referral rates, they felt there was a need to look at this variation and to identify those general practitioners at the top and bottom end of the spectrum for further attention. Initially, there was an enthusiasm for identifying general practitioners at the top of the spectrum, but those of us who had been working in the area pointed out that this could hardly be justified, except on the grounds that the objective was simply to save money by reducing the referral rate of those general practitioners with a higher than average rate. In the initial Primary Health Care Green Paper (1987) there was a statement about referral rates and an indication that the Department of Health would like to provide general practitioners with information on their own rates and how they compared with other doctors. This was followed up with the suggestion that independent medical advisers should single out and talk to those general practitioners with particularly high or particularly low rates of referral.

I and other researchers in the area of general practitioner referrals have urged caution in the uses made of crude information about referral rates. Before we make use of

1 DISTRIBUTION OF RATES OF REFERRAL TO CONSULTANTS FOR THE 201 DOCTORS PARTICIPATING IN THE STUDY

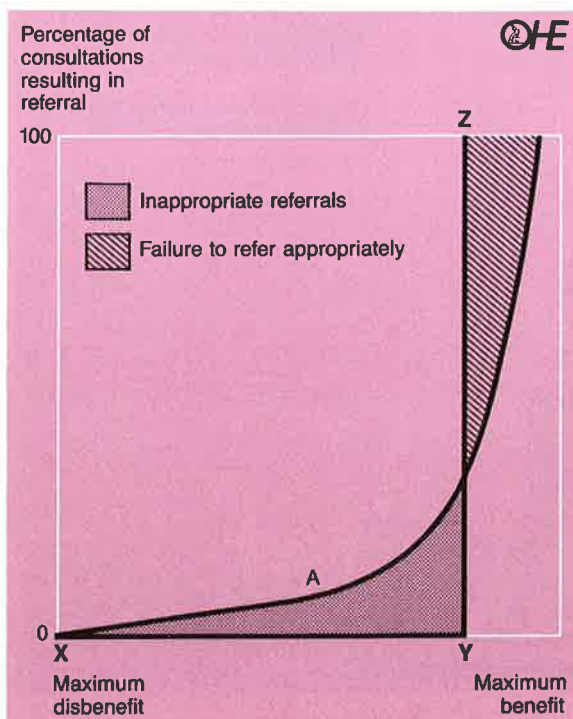


Source: Wilkin & Smith, 1987(a)

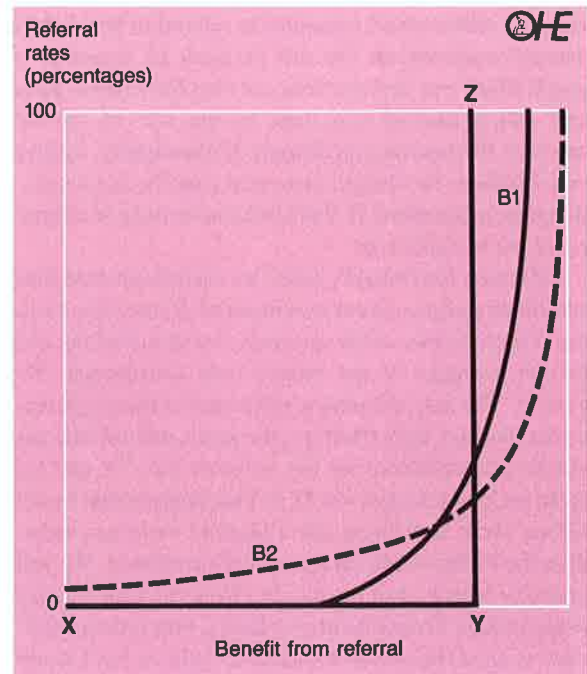
such information, it is essential to understand the limitations of the data and therefore the conclusions that can be drawn from it. I have prepared a couple of diagrams which I hope will illustrate some of the limitations of such information. In Figure 2 I have suggested that it would be possible in *theory* to classify every single consultation between a patient and a general practitioner in terms of the potential benefits which might accrue from a referral to hospital. In theory, if you are able to take everything into consideration it would be possible to work out what the benefit to the patient would be of making a referral at the particular consultation.

The horizontal axis in Figure 2 represents the universe of all consultations ranked according to potential benefit to be derived from referral to hospital. The vertical axis represents the percentage of patients referred. The line XYZ represents the ideal position. At point X no patients are referred; at point Y all patients are referred. In other words, only those patients who will receive the maximum benefit will be referred to hospital. If you increase the amount of provision, you could move the line further along and maybe other people would also benefit. Ideally, however, patients who are referred should be those who would receive maximum benefit. If we look at the position as it is at present, again theoretically, I would suggest that it might look something like the line A, Figure 2. This may be somewhat optimistic. Some patients are referred who

2 CONSULTATIONS CLASSIFIED IN TERMS OF BENEFITS WHICH COULD BE DERIVED FROM REFERRAL TO HOSPITAL



3 AVERAGE REFERRING GPS

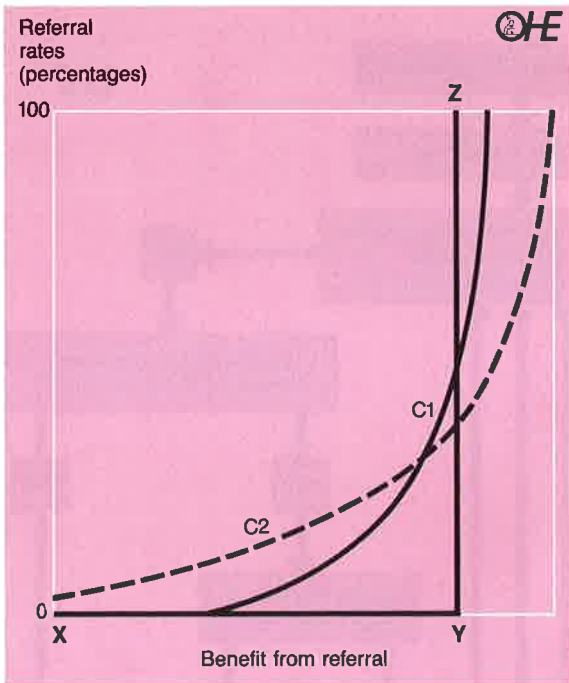


could have been treated in general practice, or at least who will receive less benefit from a referral than other patients who might have been referred. Others are not referred who would clearly have benefitted from a referral.

If we consider increasing or reducing the referral rate either of individual general practitioners or all general practitioners collectively, then we are simply moving the curve. We are not necessarily doing anything at all about changing its shape. Therefore, all that will happen if you move the curve A to the left is that you will include more of the people who would benefit from a referral, but you will also at the same time include more people who would not benefit from a referral. What we should be aiming to do is to change the shape of the curve. Only by changing its shape will we actually improve the effectiveness of referral, and therefore the efficiency, if efficiency is defined in terms of both costs and benefits from referral. That should be our target.

The conclusion I want to draw from this is to emphasise the limitations of crude information about referral rates. If we consider the task facing the independent medical adviser selecting general practitioners with whom to discuss their patterns of referral, the problem rapidly becomes apparent. Let us suppose that we have two general practitioners whose referral rates are represented by the curves B1 and B2 in Figure 3. Both of them have an approximately average rate, but it is quite clear that the general practitioner represented by the B2 curve has a much less effective pattern of referral. He or she is referring many more patients unnecessarily and is missing a lot

4 HIGH REFERRING GPs



of those patients who would actually benefit from referral. The general practitioner represented by the curve B1 is clearly much better. If we look at general practitioner's with high referral rates, we find a similar pattern, as illustrated in Figure 4. From the point of view of the independent medical adviser facing the question 'Which general practitioners should I go and talk to about patterns of referral?', the decision clearly cannot be based solely on referral rates. It is certainly arguable that the general practitioner represented by the curve C1 who has a high rate of referral has a better pattern of referral than the average referrer represented by the curve B2. In other words, using referral rates to identify general practitioners with inappropriate patterns of referral is inadequate, and potentially quite dangerous, because it fails to take into account the appropriateness of referral or the benefits to be derived from it.

If crude information on referral rates is not very helpful on its own, what sorts of issues should we be addressing to achieve more effective and efficient use of hospital resources? It seems to me that there are five key issues here which we should be considering.

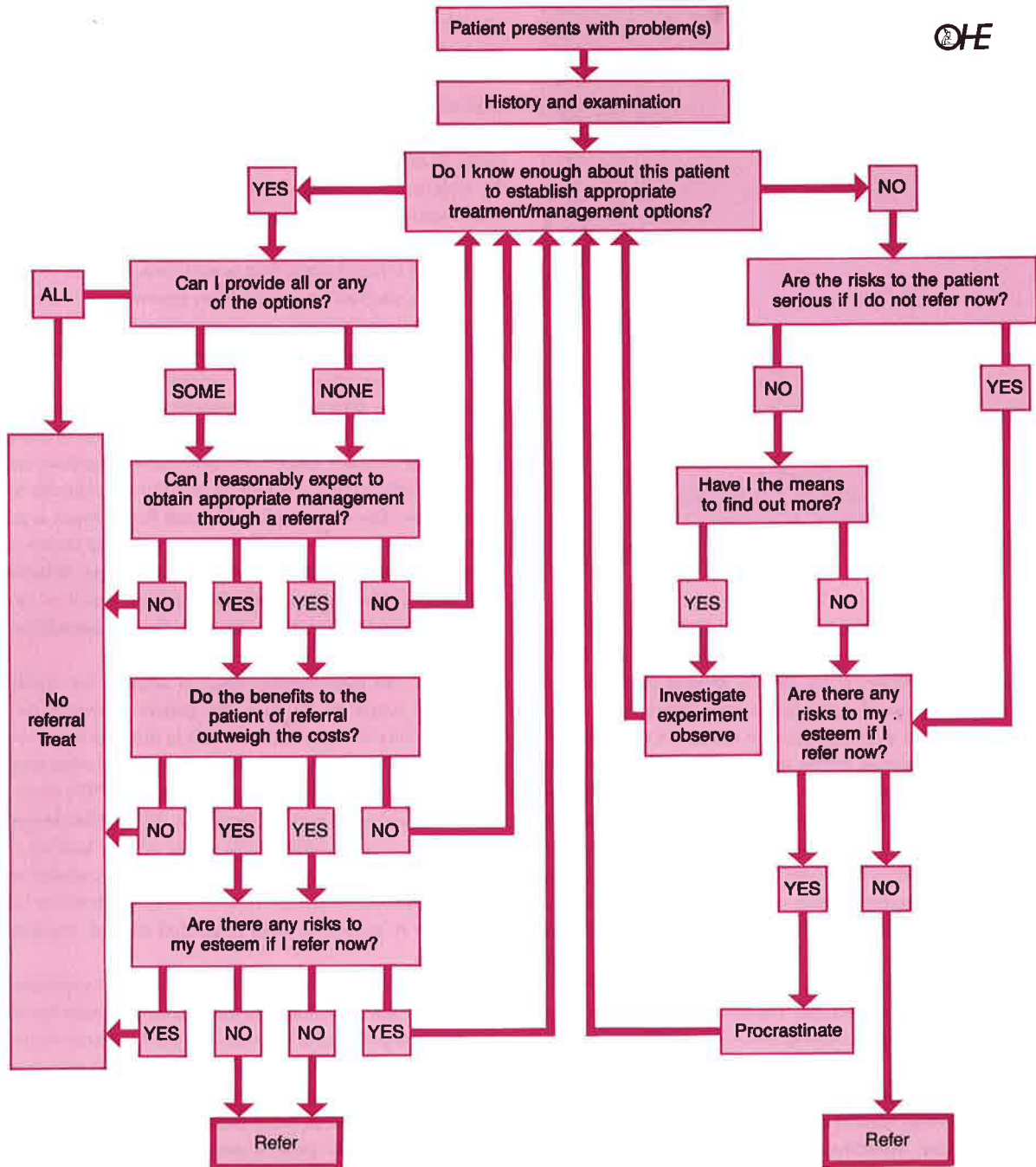
The first and perhaps most important issue is that the appropriateness of a referral must be defined in terms of the outcomes for patients. Presumably, when we talk about whether a referral is appropriate, what we actually mean is whether the patient benefits from the referral. There is currently very little research into the outcomes of general practitioner referrals to hospital. We need to focus a lot of attention onto this area. In doing so it is essential to

remember that research in this area must address the problem of outcomes for patients who are *not* referred as well as those who are referred. This is one of the most difficult problems in research terms, but I think it is essential that we tackle it.

Secondly, we need much more sophisticated information about patterns of referral. It is time that we stopped looking at crude referral rates and started looking at patterns of referral by specialty, by consultant, by hospital, by urgency, by reason for referral and so on. There is much statistical information to be collected which could be useful in the process of audit. If the information stops at the level of referral rates, then general practitioners would be entirely justified in saying 'This information is meaningless. We cannot draw conclusions about our behaviour from it.' There is a need to collect much more comprehensive information about patients referred to hospital, particularly those referred to outpatient departments. It is certainly still the case, as far as I am aware, that in most areas of the country there is no systematic procedure for collecting information on general practitioner referrals to outpatients. The East Anglian Referral Rate Project is an exception in that area and the work that Conrad Harris is doing in Leeds is a further important pilot project. What is problematic, however, is that at the moment there does not seem to be any move to make the collection of comprehensive information a priority.

Thirdly, we have largely failed to address the vitally important issues to do with the patient's perspective. There are very few pieces of research in this area that have looked at what patients think of the referral and what they think about the outcomes. Ann Cartwright's (1989) recent work in this area is a notable exception. We in Manchester are making a small contribution in this area by looking at the extent to which patients are involved in the choice of hospital, and consultant for elective surgery. However on the whole it remains a very neglected area of research work.

Fourthly, we need to look at the determinants variation. I am talking not only about variation in referral rates but in all aspects of patterns of referral. We need research which begins to look at what the determinants of such variation might be. We in Manchester have devoted considerable attention to looking at what factors might be associated with differences in general practitioner referral rates. Those of you who have read our papers will know that we came to no very startling conclusions. None of the variables we looked at such as age, sex, length of time in practice, size of practice etc. explained more than a tiny fraction of the variation in referral rates. We need therefore to begin to look much more carefully at the possible psychological variables. We need also to look at the impact of knowledge, education, and the availability of services in relation to the broad pattern of referrals. I think this sort of work will begin to throw light on the information we have



and how that information might be used to make better use of resources.

Fifthly, and lastly, we need a much better understanding of the referral decision. Whether we are looking at prescriptions, investigations or referrals, we have to begin to understand the processes that are going on in terms of decision making. To do so will require substantial investment in research. However, it is another area which has been sadly neglected in British research on the issue of general practitioner referrals. Apart from Robin Dowie's (1983) excellent qualitative study, there is relatively little published research in this area to date. There are a few studies going on at present and a number of models of the referral decision have been advanced. My own theoretical model is shown in Figure 5. I developed this about three years ago, following all of our work on the analysis of information on referral rates (Wilkin and Smith, 1987b). Whilst I have become less happy with it as time goes by, it does illustrate the complexities of the issues we are talking about. It is quite clear from this model that any particular set of explanatory variables is unlikely to explain the process as a whole. Thus, for example, some researchers have begun to focus on the issue of tolerance of uncertainty as a factor in the referral decision. This might be important if the answer to the initial question in my model: 'Do I know enough about this patient to establish appropriate treatment and management options?' is 'No'. In this case the psychological variables are likely to be important. However, many referrals have little to do with uncertainty, at least not uncertainty about diagnosis. They are referrals for procedures or services. This is quite a different sort of decision which may be influenced by very different sorts of factors.

Clearly, the referral decision is in itself extremely complex, but I would add one further layer of complexity to those already illustrated in my model. It is the very fact that the model looks at the referral decision and attempts to understand this in isolation. It seems to me that what we are talking about in all of the discussions at this symposium is clinical decision making. We should not then be concerned only with the prescribing decision, the referral decision or the investigation decision. The taking of the clinical decision is a complex process which encompasses a wide variety of different options. One of the other contributors has pointed out that in looking at prescribing data we are ignoring information about what those same general practitioners are doing in terms of utilising specialist resources, or what they are doing in terms of utilising investigations. If we want to understand what factors are important in decision making we have to make the effort to move from concentrating solely on prescribing, referral, investigation, etc. and begin to integrate these into some sort of coherent whole which represents a better understanding of the complex process of clinical decision making. Only in this way will it be possible to enhance our understanding of variations in referral rates.

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Footnote: The published and current research on general practitioner referrals to hospitals referred to in this presentation are reviewed in a recent report by David Wilkin and Ceri Dornan 'General Practitioner Referrals to Hospital: a Review of Research and its Implication for Policy and Practice'. This is available from the Centre for Primary Care Research, Dept. of General Practice, University of Manchester, Rusholme Health Centre, Walmer Street, Manchester, M14 5NP at a price of £5.

PATTERNS OF HOSPITAL REFERRAL

Angela Coulter

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For the last few years I have been involved in a number of studies in which general practitioner referrals were an important component, though not necessarily the focus, and our research is continuing. We have examined patterns of outpatient referral in the Oxford Region and found threefold variations between practices (Noone et al 1989). We have considered various factors which might explain the variations we have observed, and we have started to look at the consequences of variations in referral rates, particularly the effect on patterns of hospital admission. The next step is to tackle the difficult issue of measuring outcomes and trying to assess the appropriateness of referral decisions.

Today I shall show you some of our findings and discuss some of the conclusions we have reached so far. I will not,

because of the shortage of time, go into very much detail about the methods.

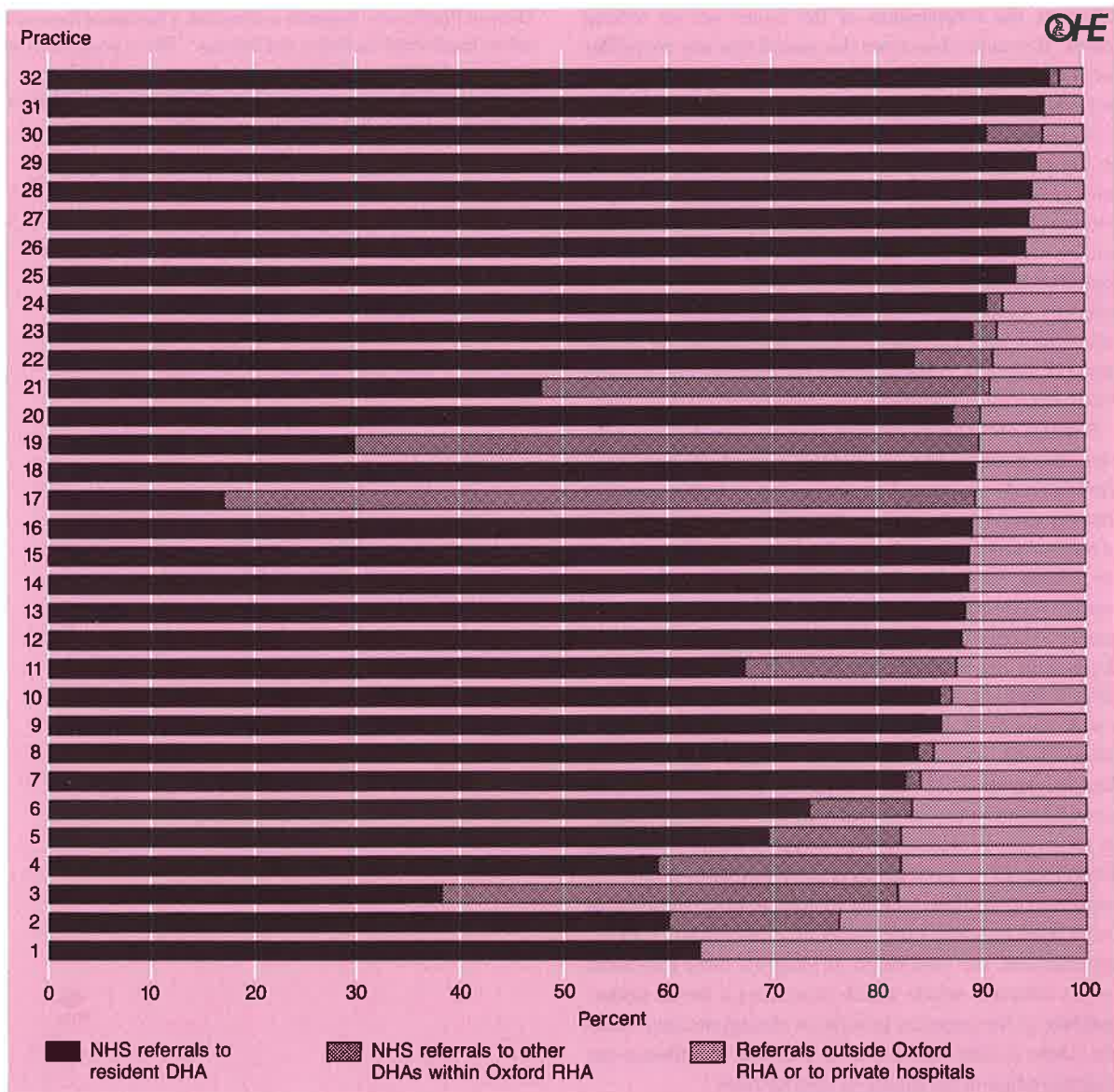
Before I became interested in referrals I had been researching variations in hospital admission rates with Klim McPherson and other colleagues in Oxford. There has been considerable interest in trying to explain vari-

1 SOURCES OF VARIATION

Statistical:	random variation or missing data
Morbidity:	differences in the prevalence of disease
Supply:	availability of beds, specialists, etc.
Demand:	differences in patients' expectations
Clinical:	differences in practice styles

Sanders D, Coulter A, McPherson K. Variations in hospital admission rates: a review of the literature. King's Fund 1989

2 DESTINATIONS OF OUTPATIENT REFERRAL FROM 32 PRACTICES IN THE OXFORD REGION



ations in hospital admission rates, particularly in the United States and Scandinavia as well as in the UK (Sanders et al 1989). Early studies focussed on admissions for common elective surgical operations in the USA, some of which are performed at three or four times the UK rate (Bunker 1970). Attention then turned to surgical rates in adjacent small areas within countries, which were found to be just as variable, if not more so (Wennberg and Gittelsohn 1982). Even in Britain there are quite startling variations in rates of elective surgery (McPherson et al 1982).

Attempts to explain these variations have focussed on five potential sources of variation: statistical, morbidity, supply, demand, and clinical (Figure 1). These factors also need to be considered when trying to explain variations in general practitioners' referral rates.

First, the *statistical* problems. David Wilkin alluded to some of them. There are other, more practical problems when one is comparing practices' referral rates. For example, if the data has been collected in hospital outpatient departments, it will probably exclude referrals which go outside the district or region, or to private hospitals. There are considerable differences between practices in the range and nature of hospital locations to which they refer (Figure 2). (Coulter et al 1989b) and any comparison should take account of this fact.

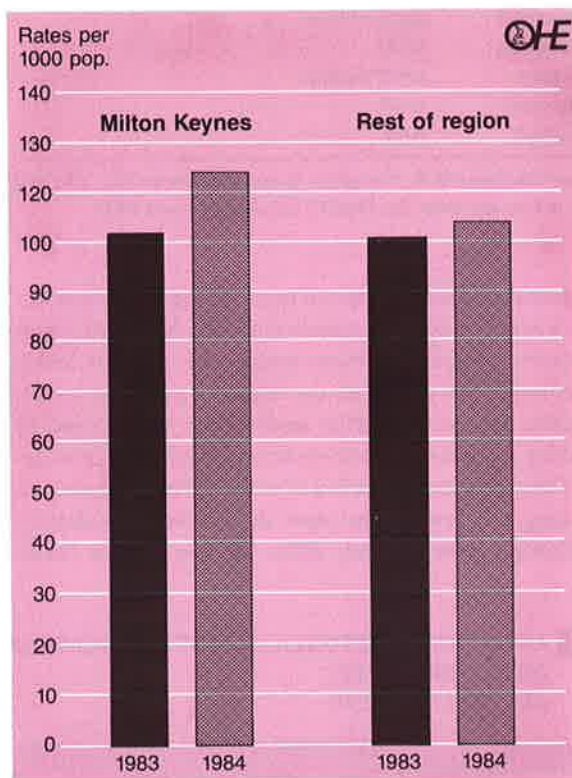
Another problem which has also been mentioned is that of random variation. When one is dealing with small numbers, as one inevitably is when comparing practices or individual general practitioners' referral rates, much of the observed variation may be simply the result of chance. Referral studies have become more statistically sophisticated in recent years and there is now acknowledgement that the variation is probably less extreme than was originally assumed. Nevertheless, several recent studies have found at least three or four-fold variation between practices' referral rates.

It is quite difficult to relate referral rates to differences in the prevalence of disease because *morbidity* is so hard to define and measure. Often the best one can do is to standardise the rates according to the age and sex of the practice population to eliminate the effects of different distributions.

We found some evidence that referral rates increased when the *supply* of local hospital services increased (Noone et al 1989). Outpatient referral rates increased in Milton Keynes following the opening of the new district general hospital in 1984 (Figure 3). However, the increase was fairly small and it may have represented a backlog of referrals held back in the knowledge that the new services were about to become available. The most surprising finding was that, even before the local hospital was opened, referral rates in Milton Keynes were very similar to those from the control practices in other districts in the Oxford region.

Teasing out the differential effect of patient *demand* on referral rates is a very difficult research problem although

3 STANDARDISED REFERRAL RATES FROM PRACTICES IN MILTON KEYNES AND THE REST OF THE OXFORD REGION BY SPECIALTY: 1983 AND 1984



an important one (Coulter et al 1988). Patients in different practices may have different expectations and general practitioners may respond to these expectations in different ways.

Finally, differences in *clinical* practice styles. We all know that doctors can make different decisions when faced with similar problems. Often these different decisions are perfectly legitimate clinically, because many common treatments have not been subjected to rigorous scientific evaluation. In other words, the decisions have to be made in conditions of uncertainty. It is often very difficult to decide which is the most appropriate time to refer, or which is the most appropriate treatment. As Dowie has shown, referral decision-making is influenced by a variety of factors including the doctor's personal style, professional training and knowledge of the health care system (Dowie 1984).

If you are looking, as we were, at differences between practices' referral rates within one region, it is possible to estimate which factors are likely to be the most important sources of variation (McPherson 1988) (Figure 4). From my knowledge of the practices which participated in our referral study, I think it is reasonable to assume that geographical differences in the distribution of morbidity in the population are unlikely to account for the variations in the

4 LIKELY EXTENT OF DIFFERENT SOURCES OF VARIATION IN RELATION TO PRACTICE REFERRAL AND ADMISSION RATES IN ONE REGION

Statistical:	medium/large
Morbidity:	small
Supply:	small/medium
Demand:	small
Clinical:	large

(see: McPherson K. Variations in hospitalisation rates: why and how to study them. In: Ham C. (ed) King's Fund 1988)

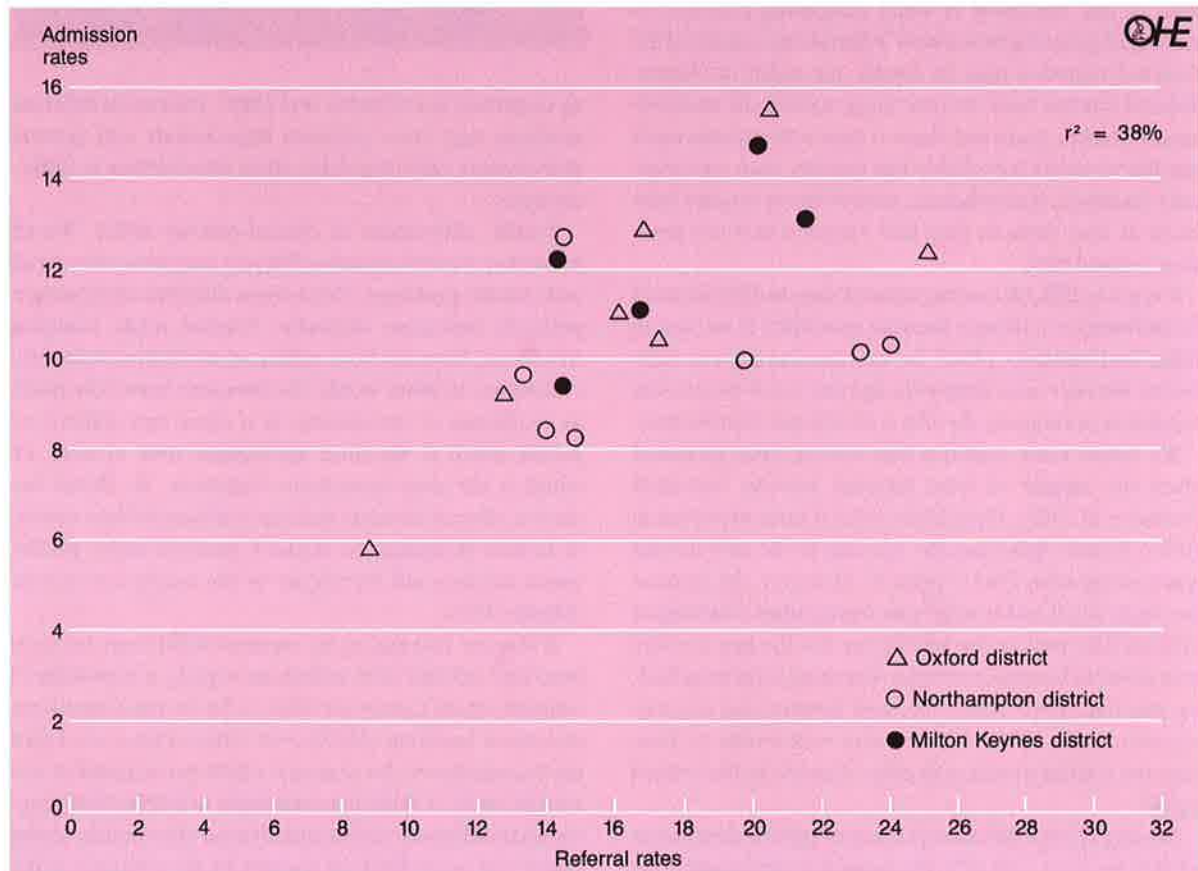
age-sex standardised referral rates. Similarly, cultural factors or patient demand seems less likely to be a critical factor when comparing practices within one regional health authority. We dealt with the statistical problems by collecting data on all referrals made by the practices and by taking account of random variation. Availability of hospital resources should not be a source of variation when comparing practices in the same district health authority, although resources may differ between district health

authorities. We therefore adjusted for the differences between districts, but found that we were still left with systematic variation in outpatient referral rates between practices (Coulter et al 1990). It seems that differences in clinical practice styles is the most likely cause of the variations.

In Oxford we are fortunate in having the Oxford Record Linkage Study, a linked data set of hospital records. These records include a general practitioner code which is recorded for every hospital admission. We were therefore able to identify the hospital admissions for patients in the practices involved in our referral study and to look at their elective admission rates in relation to their referral rates. We found that elective admission rates were just as variable as outpatient referral rates, underlining the uncertainty that characterises clinical decision-making in hospital specialties as well as in general practice (Coulter et al 1990).

We also found a significant association between referral rates and admission rates in the surgical specialties, with higher referring practices having more patients admitted to hospital (Figure 5). You may think that is not very surprising. In one sense it is not, but if the assumption is that the higher referrers are referring more patients to hospital

5 ASSOCIATION BETWEEN OUTPATIENT REFERRAL RATES AND ELECTIVE HOSPITAL ADMISSION RATES: GENERAL SURGERY

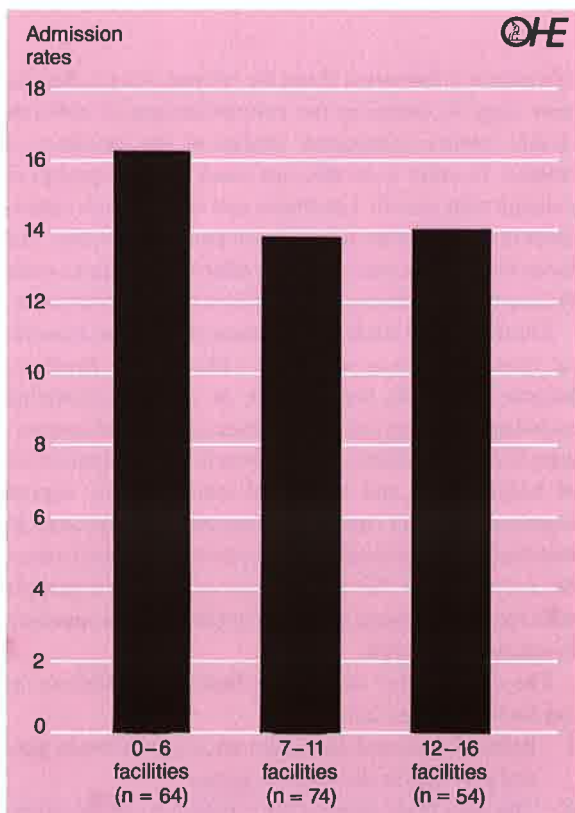


unnecessarily, then one might expect them to have a lower proportion of patients admitted. Perhaps we should be more concerned about the low referring practices who may be depriving their patients of beneficial hospital treatment.

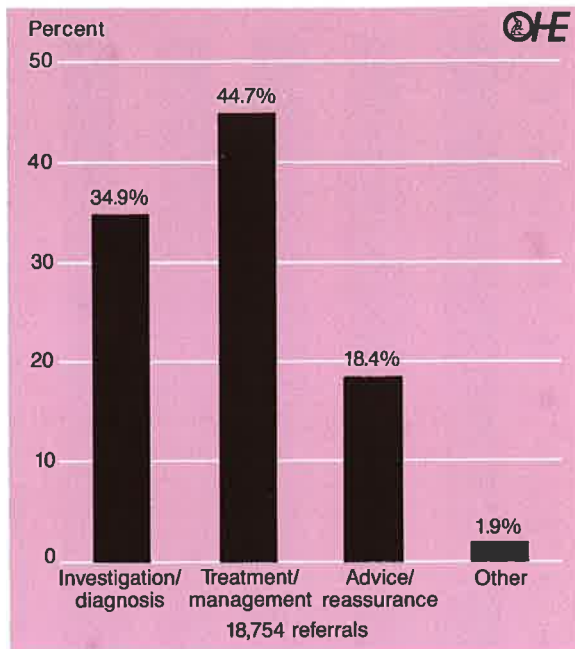
Another study of the relationship between the organisation of care in general practice and hospital admission rates concerned patients with diabetes. We sent questionnaires to all practices in the Oxford region asking them about the type of facilities they provided for diabetic patients. We asked whether the practice had a system of organised care for these patients, whether there was a separate doctor or nurse clinic, whether they had ready access to a dietician or chiropodist, whether they had facilities for blood glucose analysis or for eye screening, and about the availability of various items of equipment. We found that those practices with the least number of facilities had the highest hospital admission rates for diabetes (Farmer and Coulter 1990) (Figure 6). Another piece of evidence which suggests that standards of care in general practice have a rather crucial effect on the hospital sector.

We have argued elsewhere (Coulter et al 1989a) that any attempt to assess the appropriateness of referrals needs to consider why the patient is being referred; in other words the outcome of a referral should be related to explicit

6 DIABETES: AGE STANDARDISED PRACTICE ADMISSION RATES ACCORDING TO NUMBERS OF FACILITIES PROVIDED FOR DIABETIC CARE



7 WHY GPs REFER PATIENTS TO SPECIALIST OUT-PATIENT CLINICS

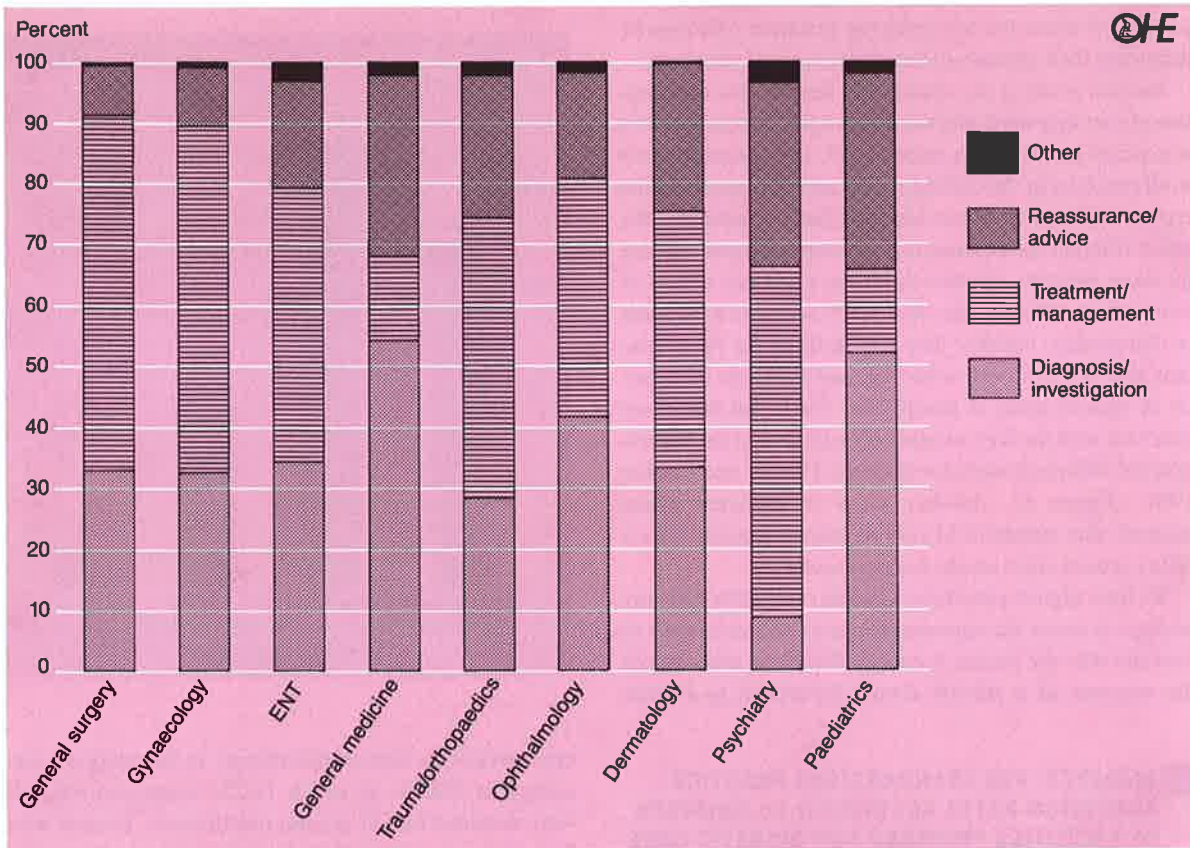


objectives at the time of the referral. In the study we conducted in 1983/4, in which 18,754 outpatient referrals were recorded by 127 general practitioners, records were kept of the general practitioners' objectives at the time of the referral (Figure 7). In a third of cases the general practitioner wanted a diagnosis or specific investigation; just under half of the referrals were for treatment or for the hospital to take over the management of the patient for a while; nearly one fifth were for advice or reassurance only, either for the patient or for the general practitioner and in a few cases a variety of other reasons were given.

The reasons for referral varied considerably by specialty (Figure 8). Not surprisingly, the referrals to surgical specialties were mainly for treatment. In fact, we found that about two-thirds of patients referred to surgical specialties were admitted to hospital following an outpatient appointment. In a large proportion of the referrals to psychiatry, the general practitioner wanted the psychiatrist to take over the management of the patient. Quite a high proportion of the referrals to general medical specialties and to paediatrics were referred for advice or reassurance.

Lately we have studied the outcomes of some of these referrals by extracting data from the general practice records of patients referred with one of five tracer conditions: back pain, deafness, otitis media, menstrual disorders and varicose veins. We were interested to see whether the actions initiated in the outpatient clinic matched the general practitioners' expectations at the time of referral. We found many discrepancies between the objectives and the outcomes; for example, only two-thirds of those refer-

8 REASON FOR REFERRING PATIENTS TO OUTPATIENT CLINICS BY SPECIALTY



red for treatment actually received any treatment, whereas many of those referred for diagnosis or advice and reassurance had treatments initiated instead. Although general practitioners recorded a reason for each referral on our study proforma, on many occasions these reasons were not made explicit in the referral letters.

This seems to highlight a problem of communication between general practitioners and the staff of the outpatient clinics to whom they refer. Certainly the outpatient departments do not always appear to be acting in accordance with general practitioners' expectations – maybe for very good reasons. However, it will be important to be more explicit about the reasons for referral decisions if they are to be evaluated as part of an audit programme.

It will also be important to agree guidelines to assist the decision-making process, and particularly to consider the role of referral in relation to patients' anxieties and preferences. There needs to be agreement about whether or not it is legitimate to refer patients for second opinions or because they need reassurance. Often these referrals are considered unnecessary by specialists, but it seems likely that they perform a useful function as far as patients are concerned.

This type of retrospective study can produce some useful

descriptive information about the referral process, but the next stage in assessing the appropriateness of referrals should involve prospective studies of the outcomes of referral. In order to do this, one needs to follow groups of patients with specific conditions and compare the experiences of those who are referred with those who are not. The focus then moves away from the referral decision towards looking at the effectiveness of different forms of treatment.

For this type of study the existence of variations in referral rates becomes an advantage rather than a problem, because variations can be seen as naturally-occurring experiments. If one can build in measurements of case severity and co-morbidity, and apply well-validated measures of health status and functional outcomes, the natural experiment should enable the comparison of outcomes in matched groups of patients who are referred in one context but not in another. We are currently attempting to grapple with the measurement problems implied by this approach to outcomes research.

The conclusions I would draw from our research so far can be summarised as follows:

1. Referral rates and admission rates vary between general practices in the Oxford region.
2. The most likely cause of the variation is clinical uncer-

tainty about the effectiveness of many common treatments.

3. Referral rates are an important determinant of admission rates, therefore attempts to access or control the demand for secondary care should take account of activity rates in general practice.
4. The development of a consensus on appropriate rates of referral and treatment will require prospective outcomes studies based in general practice.

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MEASURING QUALITY IN RELATION TO HOSPITAL REFERRAL

Martin Roland

34

First, I am going to discuss briefly variability, and question how much variation there really is in general practitioner referral rates. Then I am going to discuss the appropriateness of referral – and remind you that any distribution has two tails, and if you are going to think about inappropriate referrals, you must also think about inappropriate under-referral.

VARIABILITY

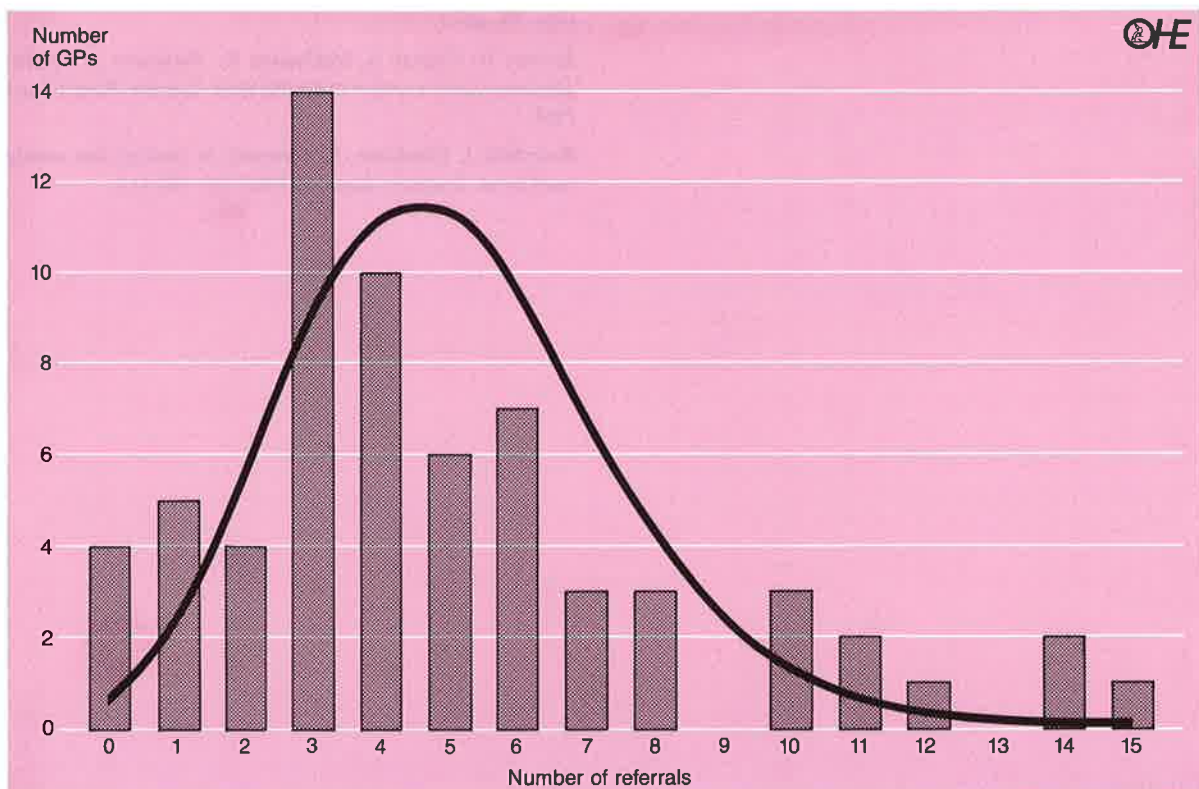
So first a word about variability. About a year ago Tim Moore and I published an article in the BMJ (1989) in which we drew attention to the fact that many of the studies which purported to show great variation – indeed up to 25 fold in general practitioner referral rates were based on very small samples of referrals, and that because of this, one might have expected some of the variation to have occurred on the basis of chance – sampling error if you like. We developed a mathematical model to determine how much variation one would expect to occur on the basis of chance alone, and we applied it to various published studies.

In Figure 1 for example, are the data collected by Robin Dowie (1984) who looked at general medical referrals over

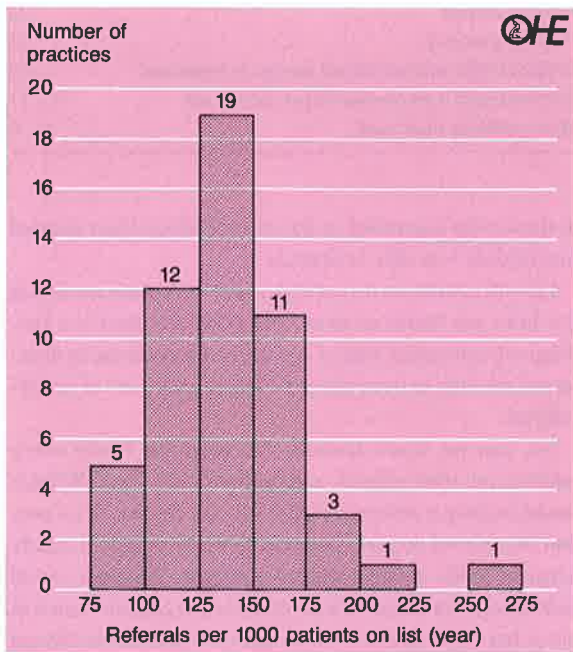
a three month period. On average, general practitioners referred four patients during the study period, but the range was from 0-15 referrals. We applied our model to her data to see how much variation we would have predicted would occur purely on the basis of chance with such a small sample of referrals. This prediction is shown on the solid line in Figure 1, from which you can see that we reckon that most of the variation found by Dowie arose by chance, and that relatively little was due to systematic differences between general practitioners.

In our paper, we predicted that if one used a sufficiently large sample, the real variation between general practitioner referral rates would probably be around fourfold. This prediction seems to be confirmed from an initial look at a year's data from East Anglian hospital computers. Figure 2 shows a histogram of the practice based referral rates of 52 Cambridge and Huntingdon practices. These data are relatively crude, only apply to practices and don't include private referrals. However, the overall ratio between the highest and lowest referring practices is round about 3.5 to 1. Now I don't want to diminish the importance of this since clearly a three or fourfold variation in use of hospital resources is of very major consequence, and requires explanation. Nevertheless, as more information

1 THEORETICAL MODEL BASED ON POISSON DISTRIBUTION SHOWING WIDE RANGE OF REFERRAL RATES FROM GENERAL PRACTITIONERS TO OUTPATIENT DEPARTMENTS PREDICTED ON BASIS OF CHANCE ALONE. HISTOGRAM SHOWS ACTUAL VARIATION IN NUMBERS REFERRED IN STUDY BY DOWIE (1984), SOLID LINE GIVES NUMBERS PREDICTED BY MODEL.



2 REFERRAL RATES OF 52 CAMBRIDGESHIRE PRACTICES DATA COLLECTED FROM EAST ANGLIAN HOSPITAL COMPUTER OCTOBER 1988-SEPTEMBER 1989



becomes available on referrals, I think it will become less and less appropriate to talk about 25 fold variation in general practitioner referral rates.

Our first paper on variability was published last year. What we have done since then is to develop this principle by applying a statistical method to allow one to split the variation in referral rates into random and systematic components, and to identify from a set of data on referrals where there is significant systematic variation between doctors, and also where referrals to certain specialties show greater systematic variation than referrals to others. We hope that this method will be of value to all those involved in interpreting referral rates, and it has now been published in the BMJ (Roland et al 1990). We hope that application of this method will prevent Health Authorities from drawing attention to apparent differences in referral rates which are unrelated to differences in referral behaviour. The paper also helps to decide which denominator to use when calculating referral rates, and whether to control for age, sex and case mix when looking at referral rates.

QUALITY

So, enough about referral rates. I want now to discuss the quality of referrals and specifically over referral and under referral.

We mounted a study of orthopaedic referrals in Doncaster in response to a comment by the consultants that they saw

a lot of unnecessary referrals. What we did was to carry out an essentially descriptive study, the aim of which was to see whether there were any ways in which better services could be provided to patients within existing resources.

We studied all new orthopaedic attendances at the Doncaster Royal Infirmary during a 13 week period last autumn. Virtually all new patients in this hospital are seen by a consultant. In this period 627 patients were enrolled out of whom only 499 attended (128 did not attend).

I have selected a very few results from this study.

First, in a substantial proportion of referrals, the consultant judged that the referral was possibly or definitely inappropriate (Figure 3). The consultants often judged that the general practitioner should have managed the problem himself, and they appeared intolerant of referrals that required management advice or reassurance only. Despite this, wanting to know that there was nothing seriously wrong was an important reason that patients gave for wanting to attend the clinic.

Secondly, unless you should think that general prac-

3 CONSULTANTS' PERCEPTION OF THE APPROPRIATENESS OF REFERRALS

Was the referral:		%
Definitely appropriate	284	56.9
Possibly inappropriate	152	30.5
Definitely inappropriate	61	12.2
No response	2	0.4
	499	100

4 VARIATION BETWEEN CONSULTANTS IN THE RATES AT WHICH PATIENTS WERE FOLLOWED UP, OR PUT ON OPERATIVE WAITING LISTS

Consultant	% followed up	% put on Waiting List for surgery
Mr A	2	11
Mr B	4	21
Mr C	24	24
Mr D	42	7

5 PATIENTS' RESPONSE TO THE QUESTION: 'WERE YOU HELPED BY SEEING THE SPECIALIST?' (N=451 PATIENTS WHO COMPLETED THIS QUESTIONNAIRE)

		%
Definitely helped	294	65.2
Probably helped	79	17.5
Not sure	40	8.9
Probably not helped	22	4.9
Definitely not helped	16	3.5
	451	100

tioners are the only ones who vary in their clinical behaviour, we found substantial differences between the consultants in the rates at which they followed patients up, and in the rates at which patients were put on a waiting list for surgery (Figure 4).

Thirdly, the patients (Figure 5) on the whole were reasonably pleased with their visit, though there were lots of complaints about the long wait to get to the clinic, long waits in the clinic, and a number about poor communications with the specialist.

Now all this is very well, but not much use unless you can use the information to improve patient care, and we were able to suggest a number of improvements to the service which we think could come out of the study. These included better information for general practitioners about available services, more minor procedures being undertaken by general practitioners, easier access to telephone advice from consultants and administrative charges in some clinics. In addition, there is the problem of how general practitioners can be helped with the management of musculo-skeletal problems that do not require surgical intervention.

If however, what you are interested in is maximising patient benefit within the NHS as a whole, you can't consider unnecessary referrals to hospitals without considering patients who would benefit from specialist care who are not referred. Looked at from the hospitals point of view, the focus is naturally on patients who appear to have been referred unnecessarily. However, from the patients' point of view, the greater problem may well be patients who need to be referred to hospital, but who are not sent. You may recall Ann Cartwright's study (1989) in which she found that 6 per cent of a random sample of the population wished they had been referred to hospital in the previous year.

Now there is virtually nothing written about under-referral, so we decided to make a start in Cambridge, at least to develop a methodology for looking at under-referral. We asked general practitioners in one group practice to identify during a two week period patients whom they saw with skin problems who they had no intention of referring to hospital. We then excluded from these, patients whose rash was obviously related to a systemic infective condition and those in whom the rash was very likely to be transient. We randomly selected 23 of the remainder and invited them to come to the practice to see a dermatologist (Figure 6).

Twenty two came and saw either a consultant or Senior Registrar. Recommendations about change in treatment were made for 16 patients. We then contacted the patients 6 weeks later, when we found that 11 of the 16 had followed the dermatologist's advice, and six patients reported a definite improvement in their skin condition. This was in addition to those patients who said how helpful it had been to discuss their skin condition with the dermatologist, and

6 PATIENTS WITH SKIN PROBLEMS, IN WHOM THE GENERAL PRACTITIONER DID NOT INTEND TO MAKE A REFERRAL BUT WHO WERE THEN INVITED TO SEE A SPECIALIST

Patients invited	23
Patients attended	22
Dermatologist recommended change in treatment	16
Dermatologist's recommendation carried out	11
Skin condition improved	6

to those who marvelled at the service which their general practitioner was able to provide.

Now of course we do not know that these patients would not have got better anyway, and what we need is a randomised controlled trial of specialist intervention in unreferred patients to determine the extent and costs of under-referral.

So, can we move towards the situation where every referral is an ideal referral, and the line on Dr David Wilkins model is always vertical? Well it will not be easy. We know that the referral decision depends on many things. It clearly depends on the patients clinical condition. However, it will also depend on factors which relate to the patient – such as his or her expectations – to the doctor – such as his clinical confidence and his tolerance of uncertainty – and to factors relating to the hospital – such as waiting lists and availability of specialists. There is still a lot of scope for a detailed study of the factors which influence a general practitioner's decision to refer. One aspect of this in which we have a particular interest in East Anglia is the role that management guidelines might have in influencing referral decisions.

As part of the East Anglian Referral Study, we employed a general practitioner for six months to work with consultants and local general practitioners and he wrote guidelines for the management of 60 common conditions. What we do not know is whether these have validity when actually applied in clinical practice, and we have recently obtained a grant from the Regional Health Authority to try and determine this.

What is certain is that we are all shortly going to be bombarded with more information about referrals, and I would like to end on a note of caution and remind you that things are not always what they seem to be, particularly in an area as complex as hospital referrals. I would like to finish with a quotation which Florence Nightingale wrote 135 years ago. Let us hope we have learned something since then: 'I have heard a doctor condemned whose patient did not, alas, recover because another doctor's patient of a different sex, of a different age, recovered from a different disease in a different place. Yes, this is really true. If people who made these comparisons did but know the care and preciseness with which such comparisons need to be made in order to be of any value whatever, they would spare their tongues'.

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USE OF DIAGNOSTIC FACILITIES

Sir Michael Drury

38

As we were aware from the discussion that took place earlier in the symposium about the relationship between prescribing and referrals, there is a considerable overlap and so a great many of the points I am going to make about investigation are very similar to those that have been made about the reasons for variations in the other fields. This underlines the fact that has already been made, of the interrelationship between these matters. Eventually we will have to look much more sensibly at the management of a patient and the use of all the facilities that we have to care for them.

Rather like Professor Conrad Harris, what I have to say is slightly short on fact and rather long on theory though, like him, I hope it will be apparent which one I am mainly relying on at which particular time! There is relatively speaking a dearth of good data about the use of investigations of any sort by general practitioners.

There have been a number of studies published over 25 years or so, both on an individual basis and also group studies. They help a bit, but they only allow us to make pretty general statements about the variations and about referrals.

If you look at the handicaps that we have, and that I have noted, in trying to amalgamate some of the data that is produced, the problems are largely due to the fact that when studies have been published there has been no consistent definition of what is meant and most of the data published about general practitioners' investigations have relied on relatively small groups of either volunteers or special doctors or, at any rate, people who know that they were being looked at before they started work. It is perhaps worth bearing in mind that it may be fairly skewed data.

A lot of studies give results showing that investigations have been done as part of a consultation process but they do not specify what investigation was done or indeed, sometimes, whether or not it was a laboratory investigation. They group all the investigations together. Even when there is an attempt to refine the data it is done in a fairly crude way and data relating to doctors do not usually do much more than divide them up either by age or by factors such as whether they are principals or trainees. Data about patients usually go no further than relating it to their age or sex, sometimes to social class, and, relatively infrequently, to the diagnosis that is being made. We certainly have no data at all that I have been able to track about the cost of investigations; certainly none about cost of investigations as a proportion of the total cost of the general practitioner activity for a particular patient. In addition we have little data about the factors used by doctors to determine whether or not to carry out an investigation on a patient or whether the result of that investigation alters the management of the patient thereafter. We have therefore very little outcome data from the investigation studies. We have very little data about the influence upon patients of investigations that have been done, although

there is now some coming from cervical cytology, which may well be a pointer to other studies which ought to be done.

There is likely to be some improvement. As people become more familiar with VAMP, AH-Meditel and the CIBA computer systems, and begin to enter more reliably their referrals both for consultant opinions and for investigations, we shall begin to get data that can be used to link diagnoses and a variety of other factors about patients. We may begin to get that in the near future.

What do we have at the moment? There seems to be somewhat less of a variation in referrals for investigation than there is in the two parameters that have been covered in the symposium so far. If you exclude either end of the scale and look at doctors lying between the 20th and 80th percentile of groups studied, there seems to be a variation of about 2.5 times within that group.

Secondly, if you amalgamate the studies that have been done and you look at the number of consultations that result in an investigation, it comes out at about between five per cent and 15 per cent, these being consultations which result in some sort of investigation, either radiological or laboratory investigation. I think that we ought deliberately to exclude from our consideration the extreme ends of the spectrum, because I do not believe that you will make much difference if you concentrate any effort in trying to change them. For example, one study has shown that a doctor was ordering 511 laboratory tests in every 1,000 consultations and another doctor considered at the same time was ordering only 10 investigations. They are the 'rogue' ones, and I do not think that they are worth wasting a lot of educational time on. We probably ought to abandon people like that!

Although the data on the various studies are not strictly comparable, there is evidence from laboratories that the number of laboratory investigations ordered by general practitioners has approximately trebled in the last 20 years, and shows signs of increasing. There are other more minor and less important facts: firstly, tests are more commonly done on women than men – but that may be largely due to the increased consultation pattern of women in the reproductive years. Secondly, we know that trainees and new entrants to practice are more likely to investigate than older doctors. There are probably some fairly obvious reasons for that. Thirdly, that children and the elderly are less likely to be investigated; and fourthly there is some evidence that people in lower social classes are more likely to be investigated – more likely than can be explained by their more frequent pattern of consultation. This mirrors various other studies which have tended to show that, contrary to popular opinion, the amount of care from the primary care services involving people in the lower social classes is rather higher than one would anticipate.

In the main, most tests carried out in the laboratory are relatively simple, low-cost investigations; they tend more towards making an initial diagnosis than monitoring a

chronic condition.

Although we have slightly more data about the use of radiology services, it is more confusing since access to radiology is more variable than access to laboratory services. General practitioner access to laboratory services tends to be 'open' whereas that to radiology services, in some cases, is still relatively limited. As for referrals for laboratory investigations, there is about a 2.5 fold variation in the demand for x-rays, again if you exclude my 'rogue elephants' from either end of the pack.

There are a number of studies, dating back to one published by *Vickers* in the 1960s, which tend to show that the proportion of abnormal findings in x-rays requested from general practice is much higher than that found in requests from hospital practice. I think that this is largely explained by the different diagnostic processes used in primary care and secondary care. I will say a few words about that later on. One other thing worth considering is, in my experience, that the level of communication between the radiologist and the general practitioner is somewhat higher than that between the biochemist or the haematologist, or the laboratory worker and the general practitioner. I have a feeling that this is predetermined more by the form that is used than by anything else. Radiologists do not have a series of little boxes that they put '6.8' in; they actually have a space where they have to write free script. In writing free script they tend to put an opinion, to give you advice and to suggest what ought to be done next. There might be a lesson to be learned from that.

As earlier papers have indicated, we are a little more sophisticated in looking at the factors influencing our referral of patients for consultant opinion. We recognise that it is an extremely complex process. I think that we can presume, therefore, that the factors influencing referral for investigation are also varied, if not as complex. The sorts of factors that one might assume are present will include the availability of test facilities and the convenience of getting them done, the problems posed by the test to the patient – (in terms of time and trouble), the problems posed to the doctor by getting investigations done again in terms of time and trouble and, now, the problems posed to practice nurses who often take the specimens. Factors like time, equipment, transport, et cetera, all play their part.

I often recognise occurring within me a conflict between the desire to avoid causing patients anxiety and trouble by suggesting that an investigation should be done, particularly when you know them well and you are trying to nurse them along through a period of illness and anxiety and, on the other hand, the desire not to increase their anxiety by not investigating them. It is often a difficult tightrope to walk. The level of knowledge of the practitioner and his experience must undoubtedly be a very important factor in this.

In a relatively small, local study, which was more of an audit than a research project, we identified two very high referers for cardiological opinions out of a group of 12 gen-

eral practitioners. When we looked at these two, we found that one had a clinical assistantship in cardiology and the other had never done any cardiology at all. One was a high referer from a state of high knowledge, and the other was a referer from a state of very low knowledge and anxiety. I suspect that sort of thing also happens in terms of investigation.

We are influenced quite a lot by the attitudes of consultants in the amount of investigation we do. How much 'work-up' do they actually expect us or want us to do? Other doctors feel as irritated as I do, when I investigate a patient outside and send them to the hospital and then find that all of those investigations are repeated, probably by the house surgeon or the registrar. I then receive a letter saying 'The patient will be seen by the consultant in eight weeks' time, when the results of the investigations are available' – when they were all in the letter that I sent up!

Lastly, the relationship between general practitioners and their practices may contribute a good deal. A practice that has a pattern of investigating creates an expectation among patients, in the same way that a practice that has a pattern of prescribing creates an expectation among its patients. It takes a generation or two for that expectation to die away. All the work that we are doing, persuading our patients to be investigated or not to be investigated, will probably not benefit us or them, but will benefit our successors and our patients' children.

There is bound to be a very different pattern of investigation in general practice from hospital practice, apart from the fact that we have a very different range of disorders to deal with, which are in the main acute minor illness, chronic illness or major illness that is no longer in the acute phase. This is because our diagnostic process is somewhat different. Our way of working is to construct a hypothesis and test it; then, if that breaks down, construct another hypothesis and test that. We have therefore often quite a long period of time to establish a diagnosis – which is a luxury that the hospital doctor often does not have; he has to get a bulk of investigations done immediately.

I suspect, though I have no evidence for this, that in the main we under-investigate and that if we were working better, rather in the same way as it was shown that prescribing would go up, we would investigate more – albeit more selectively than we do now. I suspect that this somewhat inappropriate behaviour might be shown to have some effects upon outpatient referral.

I also believe that we do not use investigations very well in the monitoring of chronic disease. This probably also leads the hospital into using their own outpatient services more than they otherwise would do. If they believed that as patients came back to us they were properly followed up and investigated more thoroughly by us, they might do less of it themselves.

Can audit help us in this way? We have heard about the PACT (Prescribing Analysis and Cost) data. Professor

Conrad Harris and others have discussed the relatively crude numerical data that we get from PACT and how much work has to be done to improve it. I persuaded our local District Health Authority to begin sending us some data about our referral for laboratory services. All the general practitioners in the district in which I work now get a 'bar chart' every quarter, showing, for a range of investigations from the laboratory in haematology, biochemistry and microbiology, where one lies in the user rating. It is quite interesting but it is not much use in determining whether one is working properly unless these crude numbers are converted into rates. However, it is a beginning. Variations can be looked at, the rate of mid-stream urine specimens (MSUs) that are being done for, say, urinary tract infections, or potassium levels that are measured in people with cardiovascular disease, or thyroid function, and so on.

Two other things which we have been doing locally from the Department of General Practice, University of Birmingham, also touch on this – we have been working with the Wolfson Laboratory, trying to develop electronic links between the laboratory and a pilot general practice outside. We have a link now whereby the results of all laboratory investigations come back immediately into the laboratory and are printed into the electronic notes. We are attempting to develop a series of management protocols as a result of that, so that what will come back with an abnormal result will be some guidelines about what might usefully be followed and the steps that go further. It will be part of a sort of electronic 'dialogue' between the person working in the laboratory and the general practitioner. The generation of data in this way sets us up better to start doing audits in the practice.

The final matter I would mention is the issue of in-practice testing. Again with the Wolfson Laboratory, we have been testing out, in practices, a series of pieces of equipment to see what effect this has. We are only halfway through it. We have been doing this at a relatively crude level, in that we have been looking at things like acceptability and 'which'-type questions such as 'Will it fit in your garage and will it go if you get it in?' The equipment scores reasonably high on these sorts of crude things. When we look at the cost, it is apparent that, unless there is a test that you are doing pretty frequently, it ceases to be cost effective, because the various reagents come in bulk supply; unless you have 100 patients all wanting their serum transaminase done that afternoon it becomes rather expensive. It should be possible to overcome that, however. We had not realised the level of anxiety there was in patients when a laboratory investigation was asked for. The study found that there was an assumption by the patient that when you asked for a laboratory investigation you thought that there was something seriously wrong. Having said that, obviously any delay counts. The patient satisfaction with getting an answer back very quickly is helped, although I do

not know what that does to the diagnostic pathway – because I need at least a fortnight to interpret the result that comes back and if I get it back instantly I am thrown when the patient says 'What does it mean, doctor?!' This is another interesting aspect which needs examination.

The last thing we discovered was that in terms of quality control, these pieces of equipment seemed to be much more reliable. They stood up pretty well to our anxieties about their accuracy, which was checked regularly by the Wolfson Laboratory.

In summary, the variations in referral for any sort of investigation lie in the range between two and two and a half times. I personally believe that we as general practitioners tend to under-use laboratories rather than over-use them and that, if we are to make any sense of this, the key to the whole issue is a better dialogue between the general practitioner and the specialist in charge of the investigation services.

GENERAL PRACTITIONER USE OF PATHOLOGY SERVICES

Gifford F Batstone*, Alan H Firstbrook

Obtaining general data on this topic is difficult and hence I will offer a simple parochial view of general practitioner use of pathology services, because the only data about which I feel confident to talk are our own. In this discussion, I intend to cover the change of use with time; the marked variation between practices in their use of service; the effects of general practitioners introducing screening programmes; the cost to the district of general practitioner requests, and therefore the sums which might be appropriate for general practitioners' budgets, and perhaps to allude to some of the effects which I believe will be associated with the new contract.

INTRODUCTION

Salisbury General Hospital has two units comprising 1,070 beds of all types, serving a geographical catchment area of 128,000, but with an effective catchment of approximately 178,000 people. We have therefore the dubious pleasure, in these days of contracting, of having a 40 per cent cross-boundary in-flow, and the possibility of having to agree over 36 contracts by this time next year.

Within the catchment area, there are 15 practices which are central, and where all the patients are within the geographical boundary. Of 20 boundary practices, 16 appear to use us as much as the central practices. We have seven health centres within the catchment zone.

The hospital offers a full range of services, including ENT, ophthalmology and orthopaedics. In addition we also have five regional services which account for 5 per cent of our work.

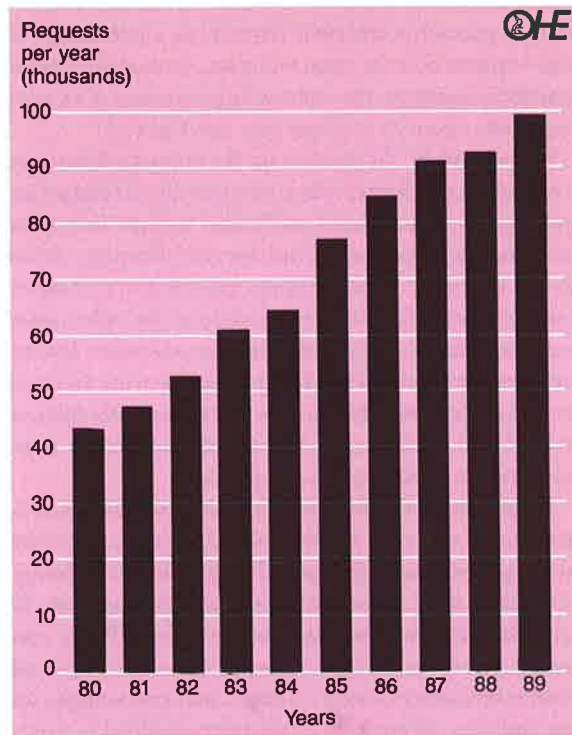
Our service policy has been to concentrate on developing a rapid turn-around, and we have data to show that, for most routine analyses, when a general practitioner makes a request, the sample has been analysed; results commented upon; and a report generated and sent out within 24 hours of the sample reaching the laboratory. For more complex batched tests such as thyroid function, our target is three days in the department, which is achieved at a 95 per cent certainty rate. For cervical cytology, 95 per cent of samples are processed and reported within 10 days.

In response to Sir Michael Drury, I have to say that we comment liberally on all results, including recommendations for referral and further tests. Every single report is seen by a consultant and commented on as much as that doctor wishes.

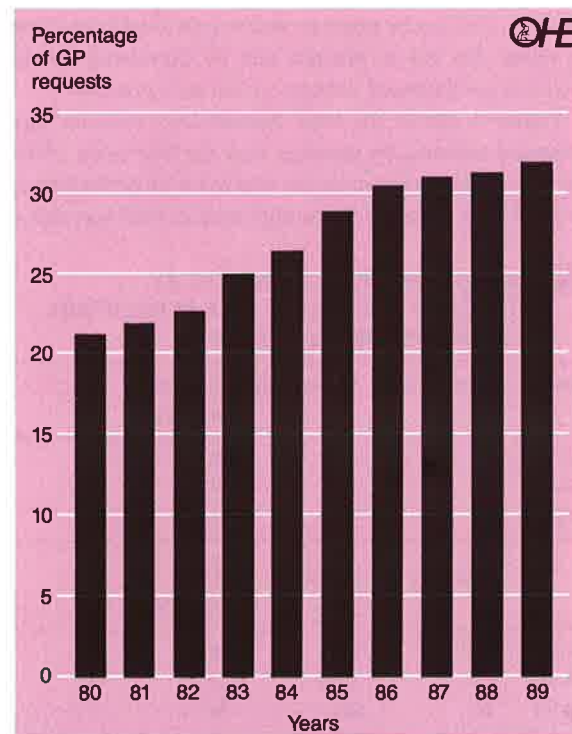
CHANGES IN USE OF PATHOLOGY SERVICES WITH TIME

The trend of general practitioner use of our services, over a ten year span, as shown in Figure 1, indicates a rise from 43,000 to 98,000 per annum. Requests have doubled in the

1 GENERAL PRACTITIONER REQUESTS



2 GENERAL PRACTITIONER REQUESTS, PERCENTAGE OF TOTAL REQUESTS



*Paper presented by Gifford F Batstone

six to seven year span – a considerable increase. Of course, requests from other sources are also increasing, but if we observe general practitioner requests as a percentage of total requests over the same ten years, we see that general practice is taking an ever increasing proportion of an even larger cake, from 23 to 33 per cent (see Figure 2).

To some extent, the problem for the pathology laboratory is related to such figures when, on a cost limited budget for pathology, we have general practitioner requests increasing faster than any other source and that rate of increase shows no sign of abating. Because of the independent contractor status of general practitioners it is difficult for pathologists and unit managers to limit their access to services. Indeed there are some indications that open access to our facilities encourages general practitioners to use our other clinical services and therefore, in the current climate, to limit access may be deleterious to the district.

The proportion of departmental services within pathology, which are used by general practitioners, over the three year span shown in Figure 3 indicate for microbiology a consistent level at just over 40 per cent; haematology 30 per cent; chemical pathology about a third – 33 per cent overall; the vast majority of cytology originates from general practice because of cervical cytology; and, interestingly, we now find that 10 per cent of the total workload in histopathology is at the request of general practitioners – quite a large increase in workload over the time shown especially as 22 per cent comes from our four plastic surgeons.

VARIATION IN USE BY PRACTICE

On the basis of this information, we determined to review the data, practice by practice, and to give a stable baseline to relate that use to practice size by expressing use as requests per thousand patients within each practice.

Figure 4 shows the total haematology requests per thousand patients, by practice, over the four years 1986-89. The ranking of practice use was based on performance in 1989. It is apparent that a high user in 1989 was also a

3 GENERAL PRACTICE REQUESTS BY PATHOLOGY DISCIPLINE AS A PERCENTAGE OF TOTAL REQUESTS 1987-1989

Year	Microbiology	Haematology	Chemical pathology
'87-88	42	28	30
'88-89	41	30	31
'89-90	41	30	33
	Histology	Cytology	All disciplines
'87-88	6	85	35
'88-89	7	77	35
'89-90	10	86	36

4 GENERAL PRACTICE GENERATED REQUESTS PER 1,000 PATIENTS BY PRACTICE FOR HAEMATOTOLOGY AND CHEMICAL PATHOLOGY

Haematology				
Year	'86	'87	'88	'89
Maximum	230	227	228	244
Mean	121	136	151	165
Minimum	76	73	75	78
Chemical pathology				
Year	'86	'87	'88	'89
Maximum	215	210	212	247
Mean	116	140	158	181
Minimum	65	79	97	61

5 GENERAL PRACTICE GENERATED REQUESTS PER 1,000 PATIENTS BY PRACTICE FOR GROUPS OF TESTS IN CHEMICAL PATHOLOGY

Renal profiles				
Year	'86	'87	'88	'89
Maximum	93	120	120	100
Mean	43	50	50	60
Minimum	17	18	24	12
Thyroid profiles				
Year	'86	'87	'88	'89
Maximum	83	102	93	87
Mean	26	33	36	42
Minimum	14	13	17	18
Glycated haemoglobin				
Year	'86	'87	'88	'89
Maximum	13	22	2	36
Mean	1	2	3	5
Minimum	0	0	0	0

The figures relate to practices which were the maximum and minimum users of each profile in 1989.

high user in 1986. These are consistent data, despite the fact that each practice has been told its use of pathology over the last three years. This information was given together with the maximum, the mean, and the minimum values, in order that they could determine their use relative to their peers, and adjust their use of the laboratory if they considered such action as correct. It would appear that they did not see fit, and hence, we have a threefold difference in use of haematology services, consistent across four years.

For chemical pathology, we have the same pattern of a fourfold difference between the maximum and minimum users of our pathology services. There is a general increase in the four year span, but with the highest still being the highest, and the lowest staying at the lowest.

If we review specific groups of tests commonly requested in biochemistry labs, such as urea and electrolytes, we again find a pattern of consistent high and low users, and a sixfold difference between the two (see Figure 5).

With assays which have more recently come to be used by general practitioners, such as glycated haemoglobin, the differences are even more marked. There is a considerable increase in requests by our maximum user – almost a threefold increase over the period of three years.

The mean value has also increased, but there are three practices who have yet to request a glycated haemoglobin. Some may think that a value of 36 requests is rather high, when related to the prevalence of diabetes given for insulin-treated diabetics at 2.2 per thousand, and those requiring oral agents, 5.8 per thousand. At this total of 8 per thousand, it appears that in this practice, on average, they request 4.5 glycated haemoglobins per diabetic patient per annum, which seems to be a little generous!

Thyroid function requests are of interest because of the considerable cost to the laboratory of this particular group of investigations. Again, the pattern of marked difference between the minimum and maximum user is seen. The practice which has scored the highest in each of these four years, in terms of their requesting pattern, reaches just over 100 requests per 1,000 patients – equivalent to 10 per cent of their patients having thyroid function tests in that particular year!

It is difficult to think of a reason why a practice requests 102 assays per 1,000 patients for a disorder which, from the Oxford data, has an incidence of one new case of thyroid disease per 1,000 patients per annum and a prevalence of seven patients per 1,000. As we were concerned about these high rates of requesting and the variations, we redesigned our request form in order that general practitioners and hospital doctors ticking the box marked 'thyroid function' were also asked to indicate the reason for doing so. This system has been running for six months.

A further stimulus was the finding that general practice accounted for 45 per cent of all the thyroid requests received, leaving 55 per cent from hospital and community services. Reviewing the data on the reasons why thyroid functions were requested, we found that 52 per cent of general practice requests were with the aim of diagnosing myxoedema; 18 per cent the possibility of thyrotoxicosis; 20 per cent were to assess the adequacy of thyroxine replacement therapy, and 10 per cent covered the other groups, such as treated thyrotoxicosis, pregnancy, hyperlipidaemia, etc. This audit of use has allowed us to assess the frequency of positive results for each type of use.

The referent range for TSH in our laboratory is between 0.3 and 4.5 IU/l. It is recognised that there are many elderly people with borderline high TSH values, but I have tried to minimise this effect by taking levels above 5.0 IU/l as positive (Figure 6). By this criterion, 14 per cent of those requests generated an elevated TSH. Taking a level of 10.0 IU/l, which I believe to be diagnostic of myxoedema, we find 6 per cent of tests undertaken indicate clinically significant values associated with myxoedema.

6 GENERAL PRACTICE THYROID FUNCTION TESTS OUTCOMES

? Myxoedema	
TSH > 5.0	14%
TSH >10.0	6%
?Thyrotoxicosis	
TSH < 0.3 and T3 > 2.85	7%
Treated T4	
TSH > 3.5	22%
TSH >10.0	6%

When the reason for request was the possibility of thyrotoxicosis, taking positive criteria as suppression of TSH with an elevated total T3, these were obtained in 7 per cent of cases. There is little data against which to judge such findings, but they will act as a baseline useful for further studies.

When patients were receiving replacement therapy with thyroxine, the TSH was elevated above 3.5 IU/l – a level indicating poor suppression of TSH in 22 per cent of cases, which seems to indicate a significant under-treating of myxoedema. The value was above 10.00 IU/l – or at a level associated with clinically overt myxoedema – in 6 per cent of requests.

Although the numbers are small for individual practices, the variation in rates of positive tests are so marked (0 to 21 per cent for the diagnosis of myxoedema) that it is difficult to come to any conclusion other than that the threshold for considering this condition is very low in some practitioners and rather high in others.

To summarise the data presented so far, there is a significant difference between the maximum and minimum requesting rates overall, and for individual groups of tests. Further the rate of disease identification is also very variable. These differences are not geographical but represent practitioner choice. There is an increasing use of pathology services in all practices and the overall ranking is roughly consistent year on year. Finally the feedback of data on use has not modified performance. That may be expected because it is written information, and reports from the USA indicate that medical audit only works where a respected peer talks face to face with the practitioners who are using the service, and motivates them into changing their practice.

EFFECTS ON PATHOLOGY WORKLOAD OF 'SCREENING'

Lipid screening seems to be a popular undertaking by general practitioners in a number of group practices in the Salisbury area. This has had a very dramatic effect on requesting for cholesterol which instead of continuing at the level of 1.3 requests per thousand, has now reached a

level of almost 6, and there is no sign of any turn-down on this rate of increase.

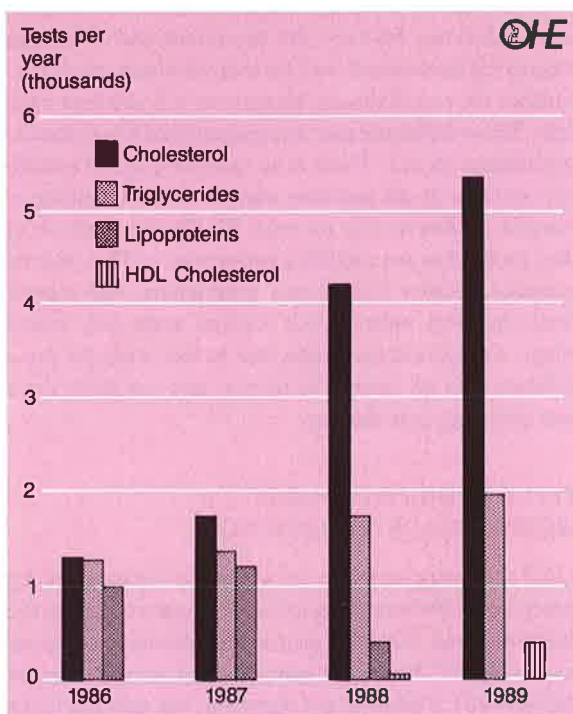
When we attempted to control cost by offering random cholesterol without triglycerides, we were successful for year one but no longer. We then attempted to minimise lipoprotein electrophoresis as much as possible, and have undertaken measurement of HDL cholesterol only when requested by the lipid clinic or by the laboratory. Despite these actions to minimise cost without impairing service, we are still not able to hold the service within budget (see Figure 7).

Figure 8 indicates that when practices decide to commence screening, their requesting rate rises from zero to 36 requests per thousand patients quite rapidly. Currently there is a twelvefold difference between the major and minor users of this service.

A further ploy to try to ensure that cholesterol requesting was clinically appropriate, was the setting of some criteria for use of this test. We used criteria based very much on the Drug and Therapeutic Bulletin recommendations, which are largely based on Oxford data. The monitoring of the three trial practices undertaking opportunistic screening as part of a scheme called the 'Healthy Heart Campaign', revealed the following data (Figure 9).

Based on these agreed criteria, the practice nurses requested cholesterol estimation on between 4 per cent and 37 per cent of those who were screened. It was interesting that the percentage of cholesterol estimations which were above an accepted intervention level of 6.5

7 LIPIDS. TOTAL TESTS



8 GENERAL PRACTICE GENERATED REQUESTS FOR CHOLESTEROL ANALYSIS PER 1,000 PATIENTS BY PRACTICE

Year	'86	'87	'88	'89
Maximum	0	6	21	36
Mean	4	6	17	25
Minimum	2	2	4	3

The figures show those relating to the maximum and minimum use in 1989.

9 FREQUENCY OF CHOLESTEROL REQUESTING AND RATE OF ELEVATED VALUES IN SCREENING PRACTICES USING THE SAME SCREENING STRATEGY

Practice	A	B	C	Average
% patients having cholesterol assays	26	34	5	19
% of assays values above 6.5 mmol/l	21	37	5	35

mmol/l, was between 32 per cent and 38 per cent, whether the requesting rate was 4 per cent or 37 per cent of the opportunistic population. This seems to indicate that the effectiveness of the screening criteria was low and little better than mass screening.

DISTRICT FINANCING OF GENERAL PRACTITIONER USE OF PATHOLOGY SERVICES

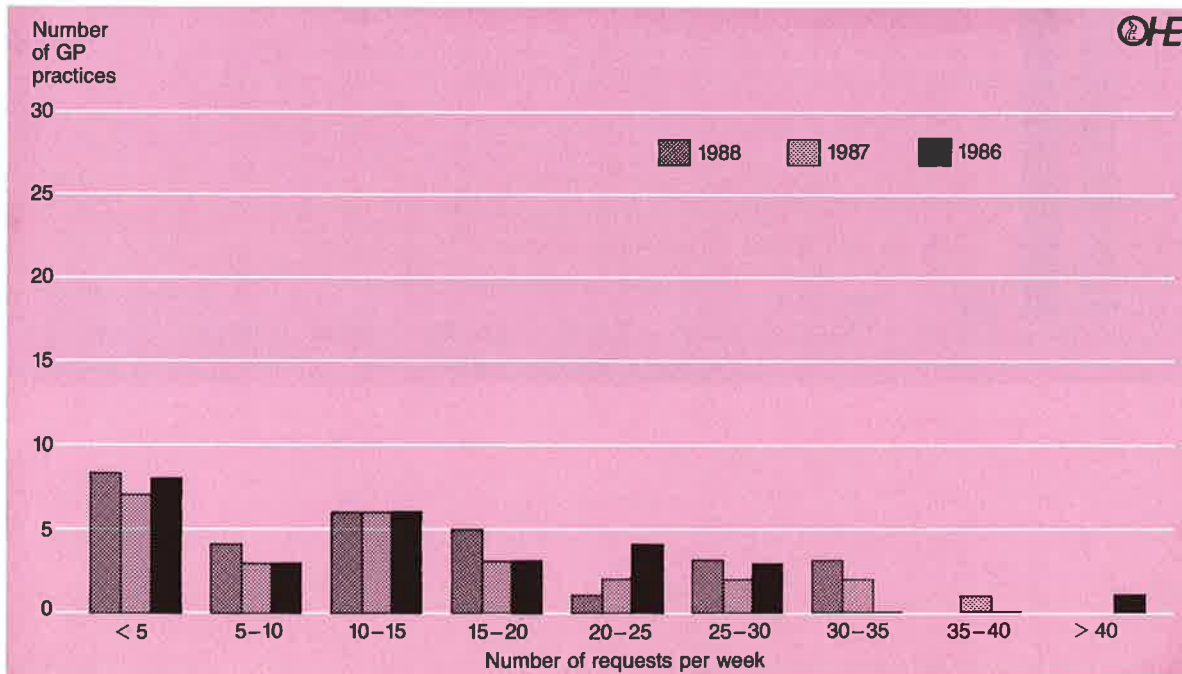
Figure 10 shows the costs to the district, in pounds per thousand patients by practice of their use of the pathology services. The figures relate to the district pathology budget and also funding from the Public Health Laboratory Service (PHLS), who are responsible for the majority of our microbiology and virology services. Taking the cumulative costs by test group within each pathology department funded directly by district, we find that the cost to the district pathology budget varies from just under £1,000 to almost £3,000 per thousand patients by practice. If the PHLS cost is added at an estimated value, the figures rise to £1,200 and £3,600. Those are pathology budget figures, and do not include rates, building maintenance, engineering or major equipment purchase. A conservative cost for these items at 20 per cent gives a true total pathology cost for a practice of 2,000 patients – an average value of some £6,500 per practice per annum.

Following the transfer of laboratory services into our new hospital, with its new equipment; its new computer; payments for equipment depreciation; and capital charges, we estimate £8,000 as being the cost per practice per annum.

10 COSTS OF USE OF PATHOLOGY £ PER 1,000 PATIENTS BY PRACTICE 1989

	Minimum	Mean	Maximum
Haem/Chem/Hist/Cyt	960	2010	2950
PHLS (estimated)	1200	2410	3540
Total	2160	4420	6490

11 GP WORKLOAD PER WEEK – SALISBURY. HAEMOGLOBIN



The portion of the district pathology budget used by various groups is: 21 per cent by general medicine; general surgery only 11 per cent, but general practice taking the lion's share of 38 per cent this year. That is equivalent to slightly more than 1 per cent of the total district budget.

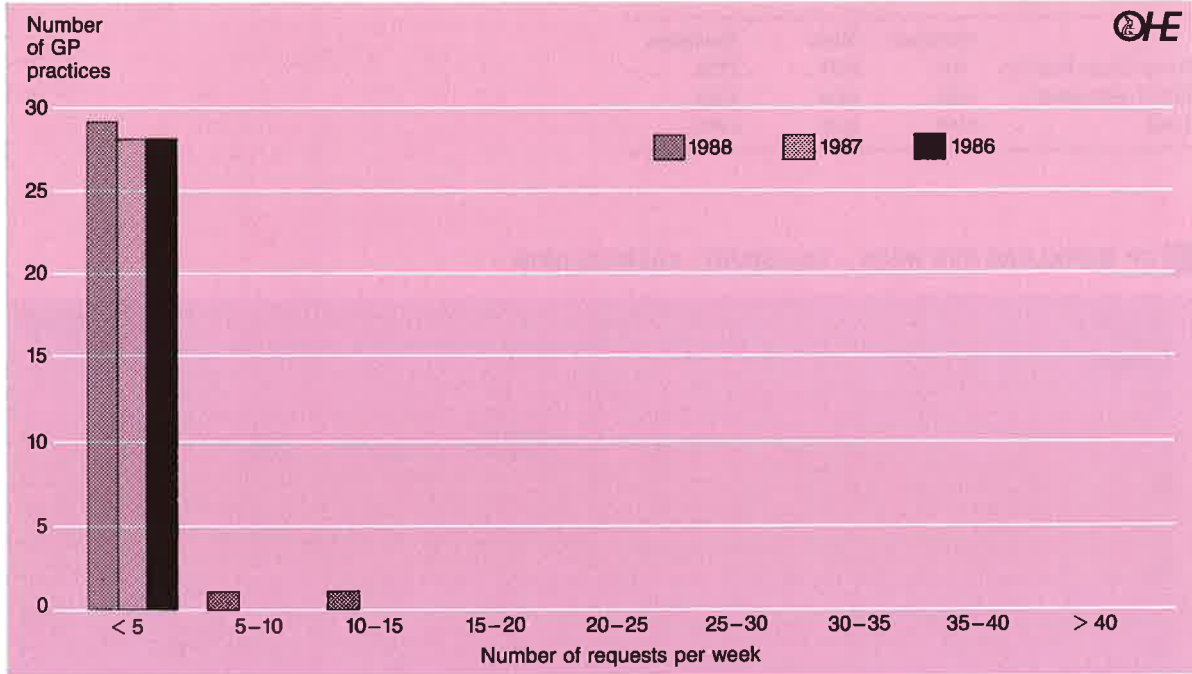
If general practice is using laboratory services to this extent, consideration must be given as to whether it is worthwhile them having their own equipment. Dr Roger Jennings from the Department of Health has calculated the weekly rates of requesting, based on last year's data. There are a number of practices reaching 30-35 haemoglobin estimations per week (Figure 11) and that might be a reasonable point at which to consider it cost effective to undertake analysis in practice premises.

However, for cholesterol (Figure 12), most practices are seeking less than five analyses per week, with only one practice reaching the 10-15 range. This does not seem to give a very worthwhile benefit for the amount of effort and cost of practice-based testing. Indeed, TSH would be a better bet (Figure 13), if the assays were available, but

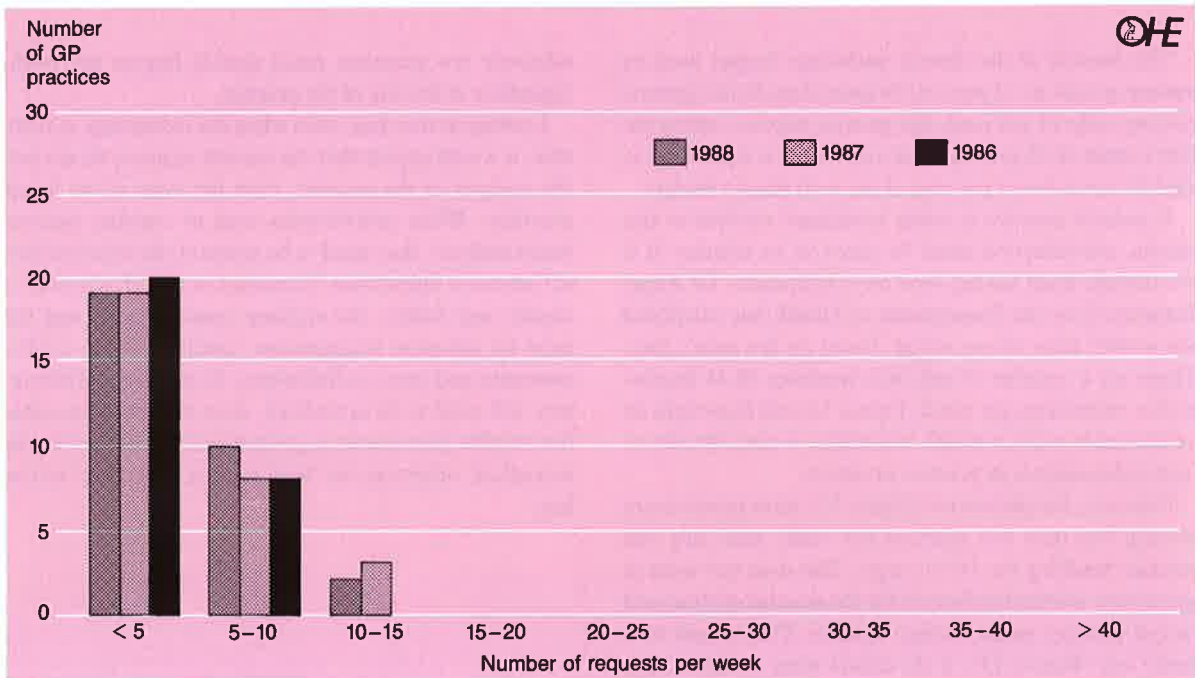
relatively few practices reach double figures per week, regardless of the size of the practice.

Looking at this data, even when the technology is available, it would appear that the current requests do not justify analysis in the practice, even for some of the larger practices. When practitioners wish to consider practice based analysis, they need to be aware of the requirements of Control of Substances Hazardous to Health (COSHH); Health and Safety; the training requirements, and the need for adequate maintenance, quality control, quality assurance and soon, accreditation. As the hospital laboratory will need to be accredited, then it seems reasonable that satellite laboratories in general practice also need to be accredited, otherwise the 'level playing field effect' will be lost.

12 GP WORKLOAD PER WEEK – SALISBURY. CHOLESTEROL



13 GP WORKLOAD PER WEEK – SALISBURY. TSH



POSSIBLE EFFECTS OF THE NEW GENERAL PRACTITIONER CONTRACT

The effects of the new contract may be making themselves manifest at present. Cervical cytology workload has been increasing over the past three years (Figure 14) associated with a recall system which had generated 3,450 requests per quarter by the third quarter of 1989. However, in our last quarter, a record 4,200 requests were received. Most laboratories anticipate a large increase in cervical cytology, even where recall programmes have already been instituted. When the turnaround time is such that 95 per cent of requests are cleared within ten days of receipt, this may stimulate further requesting.

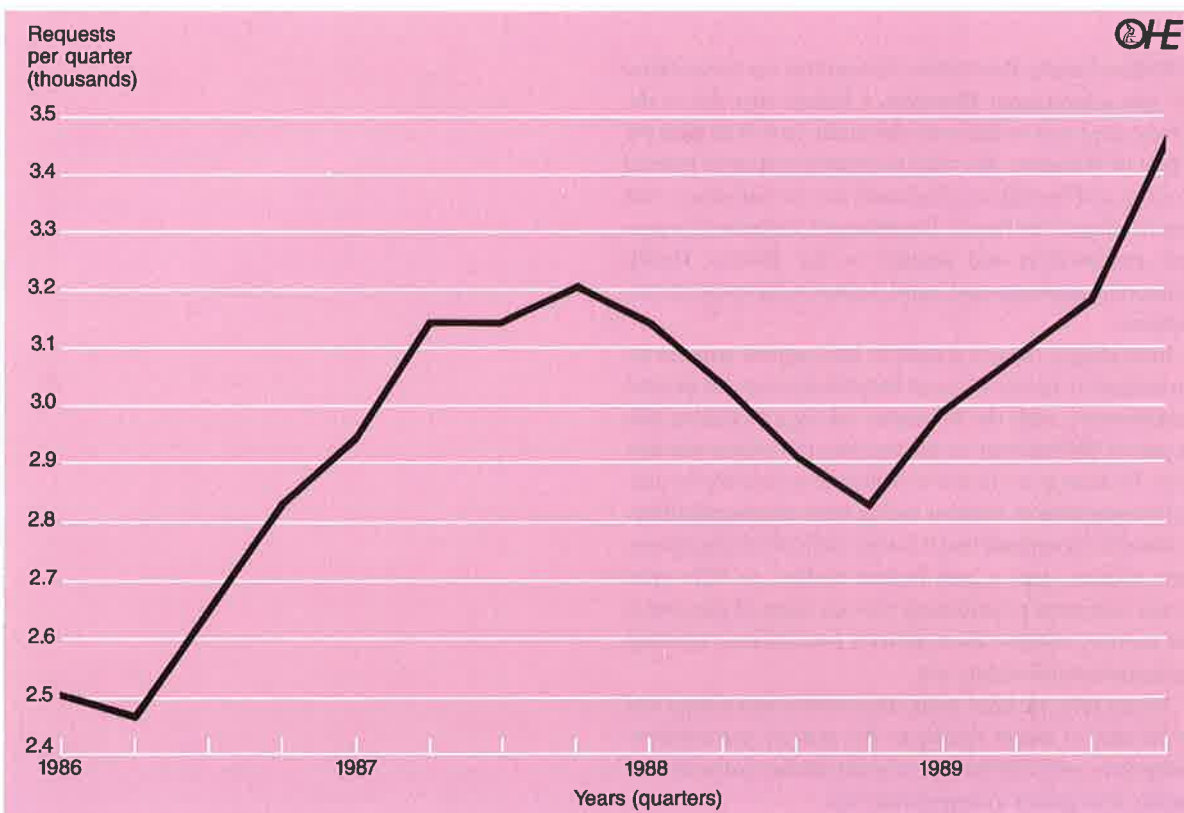
Histology samples are not often associated with general practice, and the numbers in Figure 15 are not large. However, when we calculate the cost to the laboratory of a histology request, including consultant time, at about £17.50 per request, the cost is considerable and rising quite rapidly. In their new contract, general practitioners are encouraged to remove lumps, bumps and blemishes to reduce waiting time to patients and use of hospital skills, but the laboratory costs of additional histology do not seem to have been considered. Although many such lesions are simple, small skin biopsy of a pigmented lesion may consume just as much laboratory time as much larger surgical specimens.

Cholesterol assay requests continue to rise, now reaching almost 2,000 per quarter. Here our problem is not the cost of performing the cholesterol analysis, but the cost of undertaking all the secondary tests which lead from this. Once a general practitioner has a confirmed elevated cholesterol result, then the liver function test, glucose, renal and most of all, thyroid function, follow logically. In some practices, up to 8 per cent of their requests for thyroid function are as a result of finding hyperlipidaemia. This secondary set of tests cost much more than performing the original cholesterol estimation. The thyroid function tests on 10 per cent of cholesterol estimations undertaken, cost more than performing the 100 per cent initial screen of cholesterol.

For diabetics, glycated haemoglobin and micro-albuminuria will rise as general practitioners undertake more monitoring of these patients within the practice. Screening programmes will discover relatively fit people who because they complain of tiredness have blood samples taken for haemoglobin, glucose and thyroid function estimations. This will also occur with screening of new patients and the elderly.

To obtain best quality of service outcomes and financial value from the Health Service laboratories from the use by general practitioners, medical audit must be involved. The data I have presented are good audit data, and our local

14 GP REQUESTS. 12 MONTH RUNNING MEAN



15 GP REQUESTS. 12 MONTH RUNNING MEAN



Wiltshire Family Practitioner Committee has been asking for this information. However, I believe that this is the wrong sized unit to deal with this audit, as it deals with the whole of Wiltshire. We need to create a system of general practice and hospital medical audit just for Salisbury – not one relating to the Family Practitioner Committee for general practitioners and another to the District Health Authority and Regional Health Authority for hospital consultants.

Increasingly there is a need to have agreed policies for investigation agreed between hospital doctors and general practitioners, with the laboratory taking a mediating role as part of development of the purchaser/provider relationship. Perhaps in the future we will need to dissolve the artificial separation of hospital and general practice funding. It must be recognised that it is very difficult for the laboratory doctors, with a cash-limited budget, to offer open access to general practitioners who are using 38 per cent of the service, without those general practitioners agreeing guidelines on laboratory use.

To aid this, we need more information technology and to be able to dump results to the general practitioners' computers, and display a great many protocols for investigation, and guides to appropriate use.

Martin Hartog

I think we all accept that we have a massive problem as to how to assess the outcome and value of outpatient referrals. General medicine is particularly difficult in this respect to the extent that it is difficult to predict if there is likely to be a direct relationship between the number of general medical outpatient referrals and disease indices or, conversely, if outpatient referrals were very effective, an inverse relationship might be found. It may be that, in other specialities, this assessment will not be quite so difficult.

A general practitioner colleague of mine in Bristol, Dr Martin Hime, has kindly allowed me to report the results of a study of his in which he has put various questions to general practitioners regarding their expectations on referring individual patients to outpatients, and to the consultants to whom the patients were referred on their appreciation of the factor(s) leading to the referral. He subsequently followed these up with further questionnaires to the general practitioners asking the extent to which their expectations had been fulfilled, and to the consultants as regards their views on the referrals. Overall the results indicated that there is considerable scope for improved communication between general practitioners and consultants, so that the reason(s) for referral is fully appreciated and the consultation is as effective as possible.

As far as my own specialist practice, which is in endocrinology and diabetes, is concerned, I now see all letters of referral. I quite often respond to them by telephoning the general practitioner and it has subsequently worked out that, in something like a quarter of consecutive referrals, it has not been necessary to send the patient an appointment (Hartog 1988). These fell into four broad groups. In one, the general practitioner was having difficulty interpreting endocrine (usually thyroid) function tests. Once these had been discussed over the telephone, there was no longer any need for the patient to come to outpatients. In the second group, the general practitioner wanted to discuss various principles of treatment of the patient's condition, such as mild hypercholesterolaemia or diabetes in the elderly, and was happy thereafter to continue with management. The third group comprised either those in whom it seemed in the patient's best interests to see a physician with a different speciality to mine, or one nearer to their home, and the fourth group were patients referred to me in error. For instance, one general practitioner, new to Bristol, interpreted 'endo' on the list of consultants' specialist interests as 'endoscopy'. Clearly practice of this sort will depend upon the nature of the speciality and the range of specialist interests available within the hospital.

Two particular aspects of practice that we in hospitals must, I feel, constantly keep in mind are, firstly, our tendency to ask patients to continue to attend outpatients longer than is necessary and, secondly, the habit of cross-referral between hospital departments. As regards the latter, it seems unnecessary for a hospital specialist to be asked to see someone with a problem such as mild

hypothyroidism or hypertension which could easily be managed by the general practitioner.

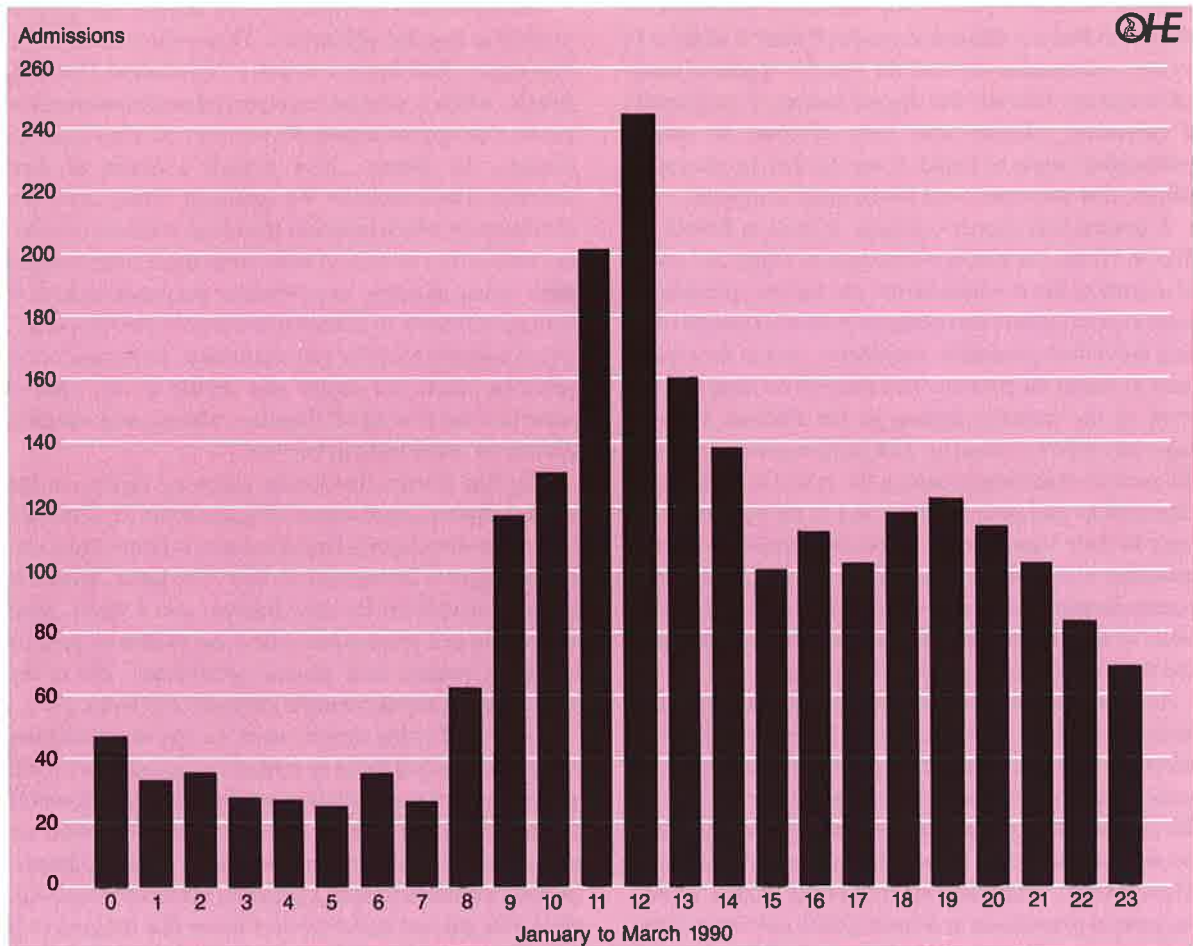
The other main interface between general and hospital practice is hospital admissions. Those who run the Avon Emergency Bed Bureau, based at Southmead Hospital, Bristol, which is used by Avon general practitioners to the extent that approximately 50 per cent of admissions go through the Bureau, have written a report of their activities which includes the comment 'There are a few conditions in which inpatient treatment is almost mandatory but for the vast bulk of admissions there is no wrong or right course of action as to whether the patient is kept at home or admitted. It is known that wide variations occur', which seems to me to be very significant. At one end of the spectrum, there are people who clearly do not need to come in to hospital and at the other, who do, with the indications for many lying in between.

The Bed Bureau had kindly given me figures on the diurnal rhythm of admissions (Figures 1 and 2). These are for a three-month period but are almost certainly representative of figures throughout the year. The times, which are those of referral to the Bed Bureau, are, I think, most interesting and presumably reflect the pattern of patients seeing or ringing their general practitioner, and of the times of general practitioners' surgeries and home visits.

Professor Teeling Smith, when he was organising the symposium, asked me to be critical and so perhaps I could mention one or two particular problems that we encounter in hospital practice. Some of our greatest difficulties are admissions of those with predominantly social problems, because the moment such a patient is admitted to hospital, the sorely pressed social services know that the patient is being looked after and the pressure on them to find alternative accommodation is reduced. Similarly we have major difficulties, although of a different sort, with psychogeriatric patients. Although mixing patients of different ages in a ward on the whole seems to work very well, elderly demented patients can cause major difficulties in wards dealing with acute admissions. In addition, I must admit to a particular concern that I have when asked to admit a patient with a chronic condition 'to get it all sorted out', which often encourages unrealistic expectations over problems that may be basically insoluble.

An essential requirement in our attempts to improve the general practitioner/hospital interface is improvement in communications. We already use a structured discharge summary sheet and I would have thought there was a strong case for using similar structured forms for both outpatient and inpatient referrals. On the outpatient referral form, a section for the reason(s) for the patient's referral would be particularly helpful, and I would myself very much like to see a comment as to whether advice by telephone or letter would be acceptable to the general practitioner, instead of the patient necessarily coming up to hospital. I wonder whether it would not be helpful if there

1 AVON EMERGENCY BED BUREAU, JANUARY TO MARCH 1990
TOTAL ADMISSIONS BY HOUR OF DAY



was known to be, say, an hour a week, at which general practitioners knew they could easily ring up an individual consultant to discuss any particular problem. As regards referrals of patients for admission, among other items to be included on a structured form, I would like to see a description of the degree of any chronic disability, as this is clearly likely to limit the extent to which one can hope to achieve an improvement.

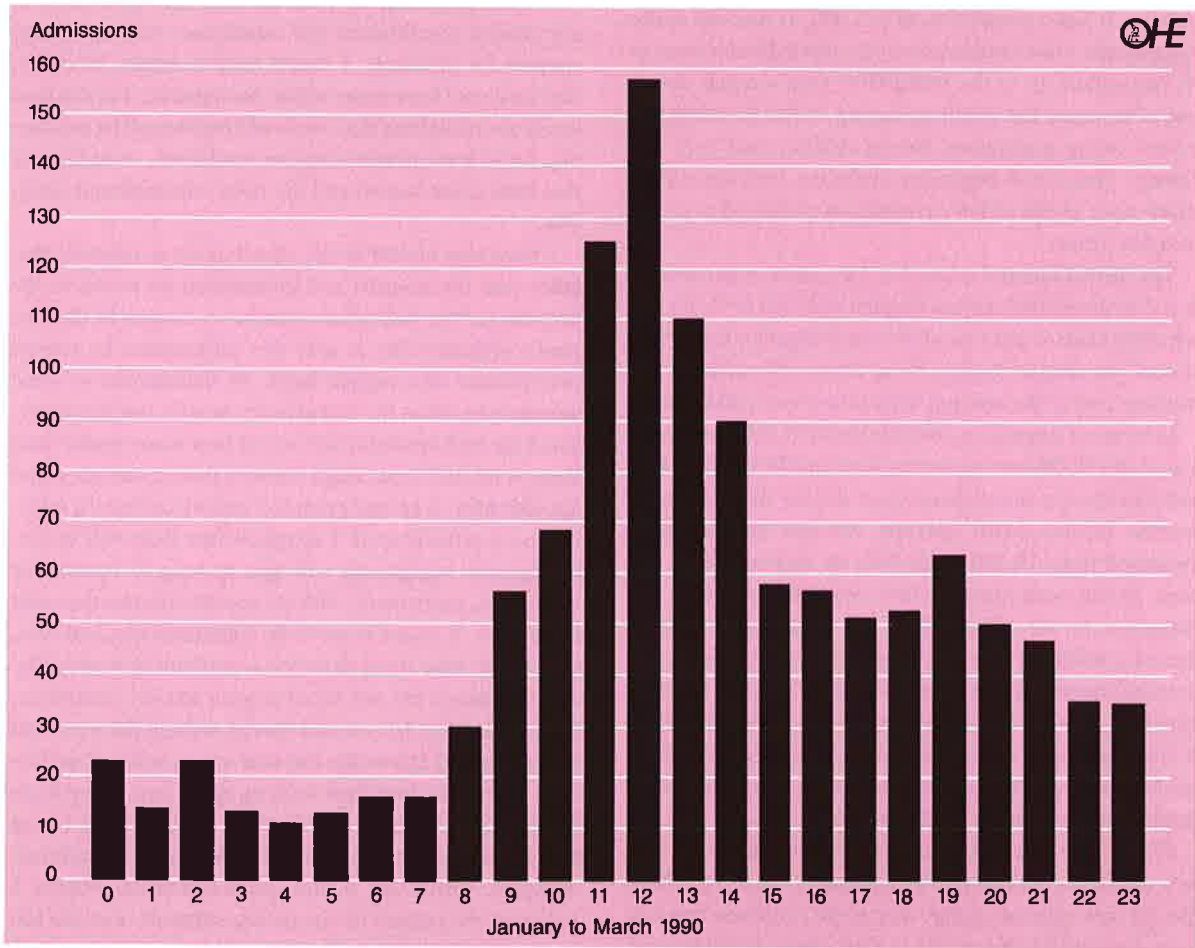
Mutual understanding of each other's problems is clearly something we must aspire to. My own feeling is that we should have a fairly low threshold for admission, because it is a heavy responsibility for the general practitioner or casualty officer to continue to look after someone whose condition they are not happy about. Thereafter, however, I am sure we must have prompt ward rounds post take and thereafter, and that patients are discharged as soon as all seems well. However, one has to recognise that every discharge, however long the admission, is a calculated risk and that someone, for instance, with chest pain, who has apparently fully recovered may well have a

recurrence the afternoon they go out. With regard to mutual understanding, all general practitioners will have spent a variable amount of time in hospital during their training, on top of which I think clinical assistantships are of immense value. In addition, however, I wonder whether it would be possible to think of regular brief periods in which the consultant works with the general practitioner and vice versa, which would give each a clearer impression of the pressures under which they both operate.

ACKNOWLEDGEMENT

I am most grateful to Dr Martin Hime and to the staff of the Avon Emergency Bed Bureau for allowing me to report their results.

2 AVON EMERGENCY BED BUREAU, JANUARY TO MARCH 1990
MEDICAL ADMISSIONS BY HOUR OF DAY



REFERENCE

Hartog M. Medical outpatients. *J Roy Coll Phys* 1988; 22: 51.

John Smyth

52

BASINGSTOKE AND WORKLOAD

Basingstoke is 35-40 miles across, and 20 miles from top to bottom. It has a population of 225,000. It was one of the original new towns and has seen very rapid development in its population up to the mid-1970s, then a much slower rate of increase, but is still increasing. It has therefore had a very young population, lots of children and very few elderly. That is now beginning to change, with some quite sharp rises in the elderly population projected over the next few years.

The district hospital is based in the middle of the district. It is a medium-sized district hospital with 420 beds. It costs something like 45 per cent of the total budget for the district to run, the district budget being about £50 million. The running cost of the hospital itself is just over £20 million.

In terms of treatments, it treats about 21,000 in-patients a year and 80,000 out-patients a year, and 30,000 Accident and Emergency attendances. Over the last three years the number of out-patient referrals, the new patients, have increased from 19,200 to 23,200; an increase of 21 per cent. At the same time, to cope with this, something has happened to the old patients. The number of reattendances is falling. There was a comment earlier in the symposium about whether or not we actually need to bring people back to the hospital as many times as they do come? It is interesting to see that because of the pressures, there has been a drop in the total number of old patients coming, from 76 per cent down to 72 per cent.

23,000 new referrals a year means something like 440 new referrals a week to a district hospital; that is something like 80 new referrals a day. For some clinicians this can mean two and a half sessions of their clinics being booked up in terms of new patients coming into the hospital. The message here is that, with increasing referrals of new patients, if there are not going to be new clinics then the hospital has to find a way of coping. This emphasises the need to make sure that there is no other alternative to the way patients can be seen.

LEVEL OF RESOURCES AND DISTRIBUTION OF REFERRALS

If patients are to come to hospital and there is no other practical alternative, I would come back to a point which was made earlier – with a large number of referrals there is a need to make sure that the referrals themselves are clear. If referral forms exist in a standard format, then there is a need for them to be filled in with sufficient detail so that the consultants reviewing the referrals know what is wanted of them. If referral forms are not fully completed, this can lead to delay when a patient comes along. Secondly, if tests have been asked for by general practitioners before a patient comes in, it is very important that the results are included on the referral. I am sure that most

general practitioners do this, but there are numbers that do not; this obviously causes delays.

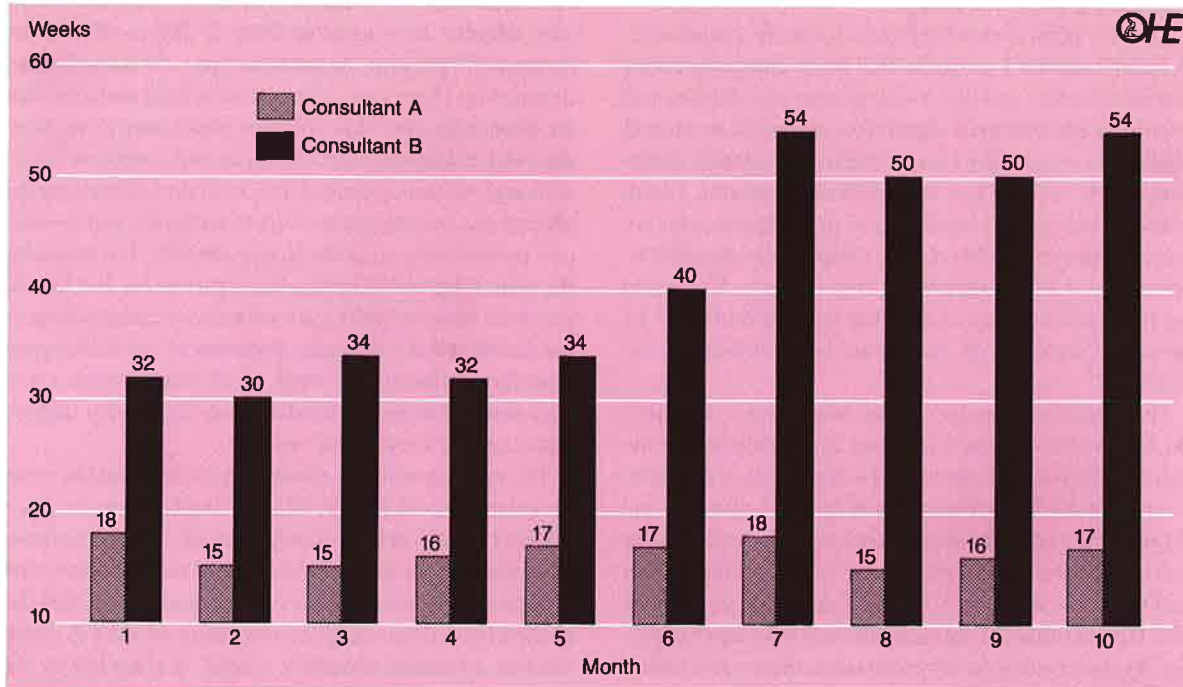
A third point that I picked up from talking to some of our general practitioners and consultants was very strong support for protocols. I would have to admit, however, that we do not have many within Basingstoke. Formal protocols are something that we should perhaps all be producing, for at least certain common conditions, to make sure that time is not wasted and the right information is available.

I have also looked at the distribution of referrals that come into the hospital and information on access to the hospital and the individual consultants. It must be the hospital's responsibility to give this information to general practitioners on a regular basis. At Basingstoke we send information out at the end of every month; not just aggregated for each speciality but saying how many weeks' wait there is for each consultant before a patient can get a first appointment. A second point is to make sure that the information is actually used. I recognise that there will be certain reasons why people will want to refer to a particular consultant, particularly with the special interests that exist these days. It seems to me to be commonsense, however, that if you have more than one consultant in a speciality and the patient has not asked to see a specific consultant, if one consultant has a much shorter waiting list, you send them to him. I know that this cuts across some of the historic practices which have built up in the past, but it leads to some most peculiar distributions of work-load. I have looked out one or two examples. We have two ophthalmologists within our district general hospital. Figure 1 indicates the pattern of out-patient referrals over the last year. Consultant A has stayed at relatively the same level, never exceeding more than an 18-week wait in referrals coming into the consultant. Consultant B starts at 32 weeks but goes up to 54. Referrals are still rolling in to this consultant, in spite of the fact that, as general manager of the hospital, I sat down with the department of general practice's executive and said 'You do realise that this is the information on the monthly return'.

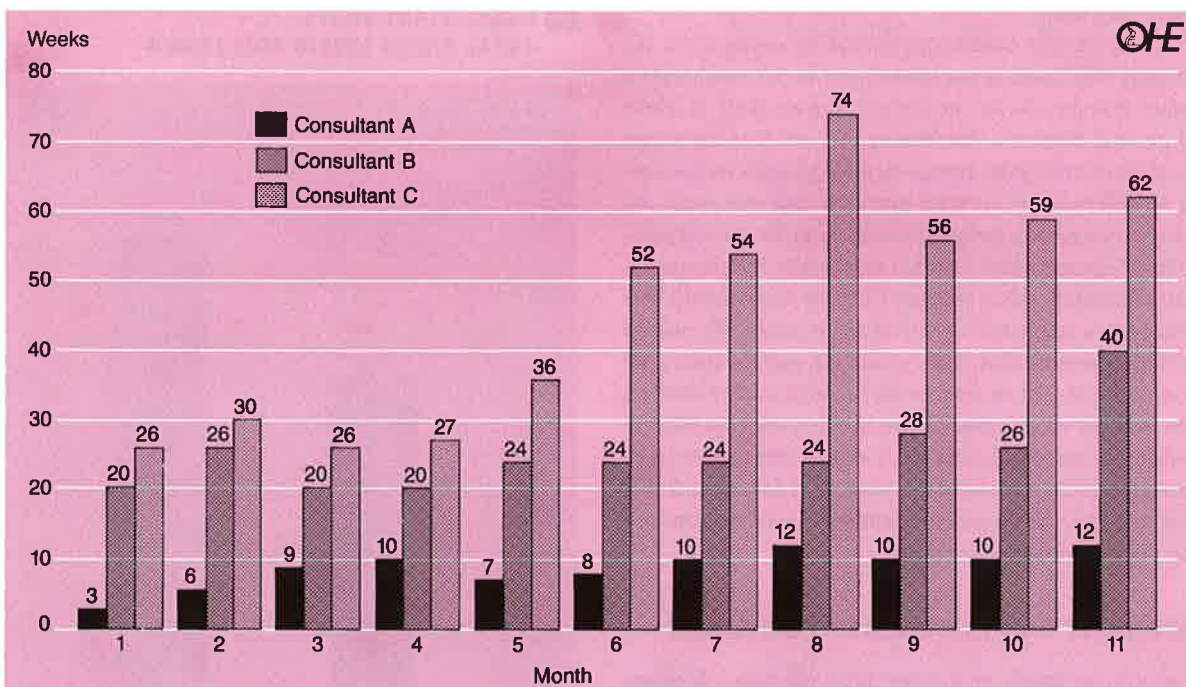
I have a further example – in gynaecology (Figure 2) there are three consultants with totally different ranges. One consultant has a very rigid protocol and criteria system for his referrals. General practitioners know perfectly well that if they do not meet his conditions he will send the referrals back to them. As a result, he has never exceeded more than a 12-week wait. The person in the middle has averaged a 23-week wait, until towards the year end when it started escalating. The third consultant was a new consultant six years ago. His work-load has increased dramatically. That is not for any special interest; it is for general referrals.

My message, in terms of distribution of referrals is make use of the information that comes from the hospital. It seems a nonsense to me, be it as a patient or as the general manager of a hospital, that we allow our facilities to be

1 OPHTHALMOLOGY ILLUSTRATIVE WAITING TIMES FOR OUTPATIENT REFERRALS



2 GYNAECOLOGY ILLUSTRATIVE WAITING TIMES FOR OUTPATIENT REFERRALS



used so poorly. In terms of value for money it must also be an appalling use of our time.

My next point is about referrals to specific consultants. In today's service I recognise that many clinicians have a special expertise, and that is why general practitioners will refer to a particular firm. Apart from protocols, we should I believe be developing a pool of referrals – specific conditions where you send an open-addressed referral. I have talked to one or two local general practitioners who are prepared to support this. I have talked to the general surgeons, one of whom supports it very strongly. It seems to me to be another way of allowing the distribution to be managed, which I do not think is happening at the moment.

My remaining messages under 'distribution' are that I am very aware that the consultant can sometimes be the only person to see new patients. I will come on to this again in terms of the White Paper, but in terms of economic use of time, there might be several arguments for making sure the consultant is not the only person: (1) the junior medical staff have to be trained; (2) if clinical assistants are working with the consultant, I am sure that they have equal expertise. By distributing the new referrals to these staff a reduction in the number of weeks' wait could be achieved.

Another point about the consultant only seeing the new referrals is that there may be a certain amount of screening that can be done before the patient is seen. It might not be unreasonable then for a member of the junior medical staff to see them, to make sure the screening is complete. This can be identified from the referral letter that comes in and should be done before the person goes on to the consultant, rather than to be sent away for more tests and then to come back again.

It may be that consultants should be seeing more old patients too. Some of our consultants do but some have a policy that they do not see any old patients at all. It seems to me that there is a distribution of work-load there that would be worthwhile. It must be good practice for patients to be followed up to make sure that their outcomes are what was expected, before they end up in the general practitioner's hands again. Another reason why I think consultants should do this is because I believe there should be a much more aggressive review of old patients. We should perhaps promote that, before each out-patient clinic, the consultant should sit down with his team and go through the number of old patients on the list, and say 'Unless something unusual comes up, I expect that patient to be scratched off by the end of this session'. I do not think that this happens, which means a number of patients continuing to come along to the clinic.

ACCIDENT AND EMERGENCY REFERRALS

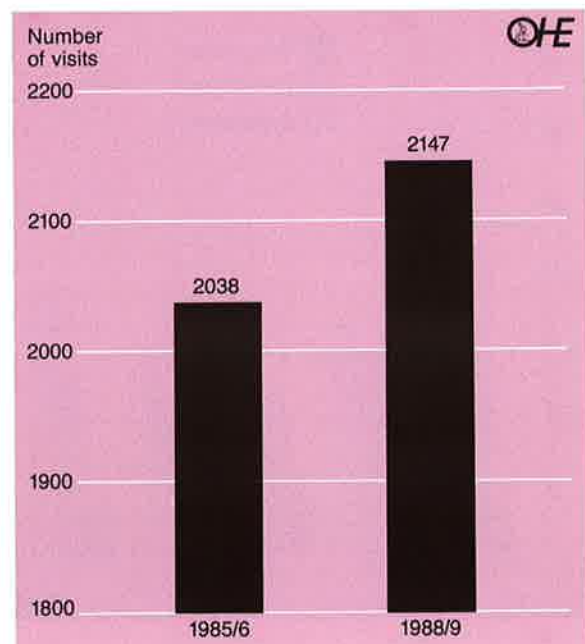
I am moving briefly on to other direct referrals – Accident and Emergency and direct admissions.

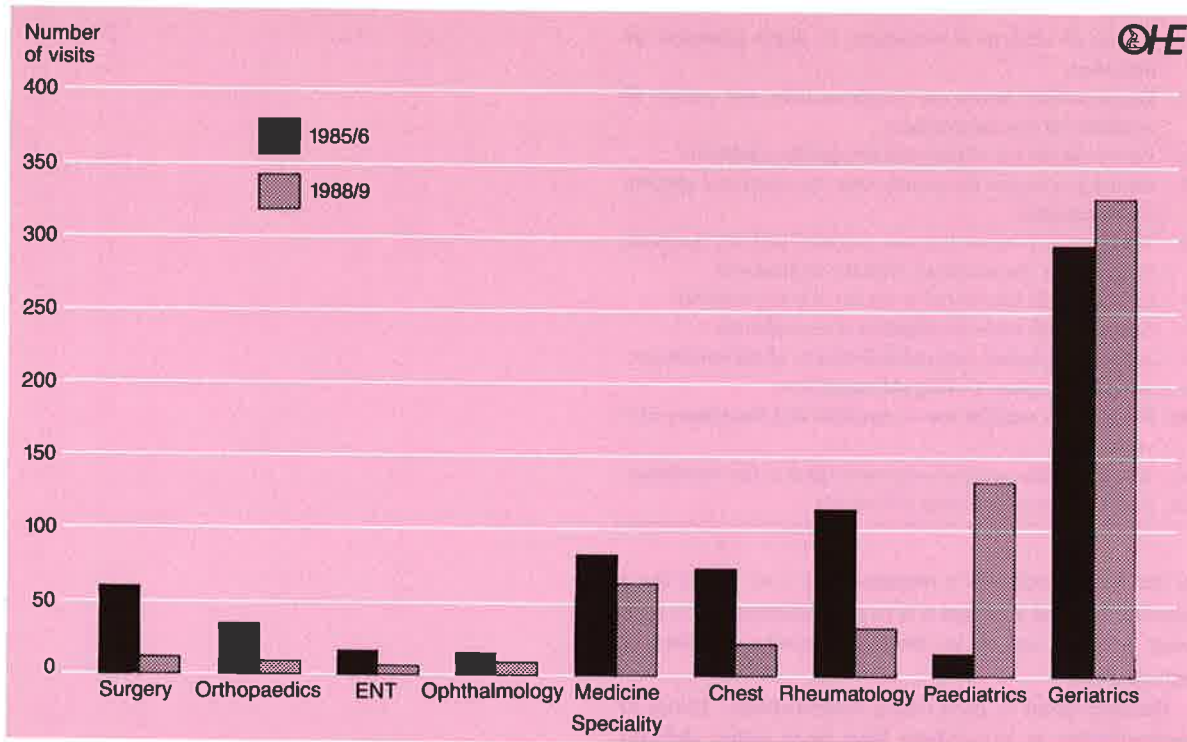
Accident and Emergency can be regarded as self-referrals. In Basingstoke between 1986 and 1988 the number of new referrals have gone up from 27,800 to 30,300, an increase of 9 per cent. At the same time, old referrals have dropped by 15 per cent. That seems to indicate to me that we must make sure that everyone who comes to an Accident and Emergency department actually needs to come. Although we cannot control this, both the hospital and the general practitioners have a duty to make sure that we educate patients into using the facility sensibly. For example, the painful leg/arm/shoulder that a patient has had for the last three weeks/months is not a reason for coming along to the Accident and Emergency department, nor is dropping in on the way home from work, which also happens. I suspect audit systems in Accident and Emergency departments need to keep an eye on this.

The majority of direct admissions in a hospital like mine are to junior medical staff. That is something general practitioners have to keep in mind. Certainly, our consultants have promoted strongly – but it has to be put to the test – that they would far rather, if there is any doubt at all, that the general practitioner rang the consultant on duty to check whether admission was really needed. It is too late by the time a patient comes into hospital; they are going to stay and go through a series of tests before going out, perhaps without any active treatment. That does happen, because the junior medical staff are under extreme pressure.

I have wondered also about promoting domiciliary visits to avoid a patient's admission to hospital. This is something you all know much more about than I do. To start off, I

3 DOMICILIARY VISITS TOTAL VISITS 1985/6 AND 1988/9





looked at what was happening with domiciliary visits. I got information (Figure 3) which seemed to show that I perhaps did not need to promote them, because they are going up quite considerably – 2,000-2,100. Not a huge rise, because it is over a few years, but at least they were going up. I then looked at what was happening within the specialities (Figure 4). I was quite surprised to find that in most of the acute specialities there was virtually nothing going on. Here is a fee-for-service type of work-load yet in surgery, orthopaedics, ENT, ophthalmology, medicine, chest, rheumatology, they had all come down. There was quite a dramatic increase in paediatrics, which I believe represents the anxiety of the paediatricians to keep children out of hospital as much as possible. In geriatrics there was also an increase.

I talked to a couple of the consultants about this and I did not really get to the bottom of why domiciliary visits are an unpopular thing to do. I suspect it is partially because of pressure on time, that is the time it takes in a rural area to get out and make those visits.

Where patients do have to come in to hospital for treatment day surgery and day care can keep their stay as short as possible. There is sometimes concern on the part of general practitioners about people going home and then the general practitioner having responsibility for the follow-up. One of the ways in which we overcame this problem was to put in two help lines – one for day surgery, so that after a day surgery session and provided the patient is well enough to go home at the end of the morning or at the end

of the day, they are given a hospital number with a duty person available, so that if they have anxieties they can ring up. Having given them that number, we have found that it is hardly ever used, presumably because they feel they have the security that it is available to them.

We did exactly the same thing in terms of the medical day unit – the offer of a number with informed advice at the end, for any of the procedures carried out there.

SOME WHITE PAPER IMPLICATIONS

Regarding the White Paper, it seemed to me that there are a number of opportunities and points which need to be grasped, or at least recognised, in the way hospitals relate to general practitioners. For example there is nothing to stop a general practitioner referring, providing there are appropriate facilities that the patients can go to, to other hospitals outside his/her district. In fact, it is in the other hospitals' interests to attract such referrals. In this way general practitioners can look for speedier access.

I mentioned earlier that the consultant should perhaps not be the only person to see new referrals. I have to recognise that under the White Paper it is up to the general practitioners to say what they want. It seems to me however that it is in the service's interests and the patients' interests to make sure, unless there are very specific reasons, the consultant is not necessarily the first person to see the patient.

Next, I was intrigued to read in the details of the White Paper that any emergency referral coming into the hospital

5 RECOMMENDATIONS

1. Ensure all referrals to outpatients or direct admission are necessary.
 2. Ensure referral letters are completed fully, and contain all available relevant information.
 3. Encourage the use of protocols for specific conditions.
 4. Ensure you receive the waiting times for outpatient appointments regularly.
 5. Where there is more than one specialist with the necessary skills refer to the consultant with the shortest wait.
 6. Encourage the identification of a list of pool conditions.
 7. Encourage the wider distribution of new referrals.
 8. Support the earliest reasonable discharge of old outpatients.
 9. Support consultants seeing old outpatients.
 10. Promote the sensible use of Accident and Emergency Services.
 11. When in doubt on direct admission speak to the consultant.
 12. Encourage good discharge procedures.
-

is the health authority's responsibility – so if you are a practice holding a budget it is in your interests not to treat your patients and to let them all become admitted as emergencies!

Another point is prescribing responsibility. Issues of responsibility in prescribing have been rather difficult over the last few years, particularly with hospitals having to control their costs, especially their drug costs. I am aware of difficulties in my own hospital, created by enforcing a two-week prescribing rule for people discharged from hospital. I can foresee difficult debates in the future about who is responsible for continuing care. For example, I am not sure whether I use the term correctly, but in terms of chronic conditions, where there has been a consultation and a particular treatment or course of drugs prescribed.

SUMMARY

I have produced twelve recommendations as a result of this presentation which could be published as a charter to promote the more efficient use of resources (Figure 5). I would certainly promote these to all general practitioners, and would hope that they would support them to achieve better, faster and more effective use of hospital facilities.