

## INDIVIDUAL STUDIES

# Referral to hospital by general practitioners

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**I**N a study of referrals to the outpatients department of a London teaching hospital, Butterfield and Wadsworth (1966) reported that, excluding inter-departmental referrals, 80 per cent originated in general practice. This figure was identical with that found by the Oxford R.H.B. (1962). This provides some indication of the rôle of the general practitioner in determining the medical demands made upon the hospital and, accordingly, the importance of understanding those factors which lead a general practitioner to initiate a hospital referral.

Studies carried out in general practice reveal wide variations in the referral rates of different doctors. Fry (1959) reports outpatient referral rates of 3.8 per 100 patients at risk per annum, compared with a rate of 25 reported by Hopkins (1956). Starey (1961), studying the habits of 30 doctors in one region, demonstrated a range of 2 to 17.3 referrals per 100 patients. He noted a slightly higher rate for doctors with large lists and practising in urban areas. This relationship with list size, and urban and rural areas, was not confirmed by Wright (1968) in a survey in South-west England, nor was he able to correlate referral rates with availability of hospital beds, nor the doctor's use of 'open access' facilities. Scott and Gilmore (1966), in their study of Edinburgh doctors, found no relationship between referral rates and type (single handed or partnership), nor size of practice, nor with the doctor's year of qualification. Backett *et al.* (1966) found a positive correlation between the doctor's use of 'open access' facilities and the number of patients referred to hospital, but Forsyth and Logan (1960) found no correlation between use of these facilities and rates of admission to hospital.

This paper reports the results of a small study of a single practice in which, however, marked differences in the referral rates of three doctors were observed. The object of the study was to investigate the reasons for these differences. By limiting the study to a single practice it was possible to do this in detail, and under standard conditions of practice organization and hospital access which cannot be obtained in studies involving several practices.

### Method

The practice provides medical care for 4,455 patients in the London Borough of Lambeth. The design of the study and the method used to calculate the practice population have been described elsewhere (Morrell *et al.* 1970). Twelve items of data were collected at every consultation for one year. These data, recorded on specially designed cards (figure 1), were extracted within 24 hours of recording. Preparation for the study took place over a period of two months, and included the use of fictional case histories on which the doctors were asked to make records in order to eliminate, as far as possible, inter-doctor variation in the interpretation of definitions.

For the purposes of this study, an outpatient referral was defined as 'any referral

to a hospital department which the patient was not, at that time, attending, *i.e.* did not have an outstanding appointment'. Inpatient referrals included all patients admitted as emergencies to hospital and excluded patients admitted from the hospital waiting list after outpatient consultation.

Hospital referrals were recorded in two ways. On every occasion that a patient was referred to hospital a special card (referral card) was raised on which was recorded the name, age and sex of the patient, the hospital and department to which he was

| DATE    | 0=0 | OLD=0 | IF 2<br>SYMPTOM          | DIAGNOSIS        | 0         | 0           | 0             | 0        | 0           | 0            | 0       | 0      | COMMENTS |
|---------|-----|-------|--------------------------|------------------|-----------|-------------|---------------|----------|-------------|--------------|---------|--------|----------|
|         | A=1 | RET=1 |                          |                  | CERTAINTY | EXAMINATION | INVESTIGATION | HOSPITAL | CERTIFICATE | PRESCRIPTION | NURSING | DOCTOR |          |
|         | V=2 | NEW=2 |                          |                  | 2         | 1           | 2             | 1        | 00          | 0            | 0       | 1      |          |
| 26/9/67 | 1   | 2     | Viral<br>Disorder<br>56. | Cervical<br>335. | 2         | 1           | 1             | 0        | 00          | 1            | 1       | 1      |          |
| 2/10/67 | 1   | 1     | 29                       | 335.             | 2         | 0           | 0             | 1        | 00          | 0            | 0       | 1      |          |
| 4/1/68  | 1   | 2     | Cough.<br>48.            | U.R.I.<br>240.   | 1         | 1           | 0             | 0        | 04          | 1            | 0       | 1      |          |
|         |     |       |                          |                  |           |             |               |          |             |              |         |        |          |
|         |     |       |                          |                  |           |             |               |          |             |              |         |        |          |

Figure 1

referred, the name of the referring doctor and his reason for referral. In addition, hospital referral was one of the items of data recorded at each consultation, but was only included if it resulted from the single diagnosis recorded at the consultation.

These two sources of data were analysed by hand sorting and by computer respectively, and the adequacy of this method of recording hospital referrals was checked in three ways.

The completion of a record card for every consultation was checked by comparing a random 1 in 5 sample of all prescriptions issued by the doctors in the practice during one month and subsequently made available by the Inner London Executive Council, with the research record of a consultation on the day of issue. In addition, a sample of laboratory and x-ray reports, drawn at random from the patients' medical record envelopes, was compared with the research record. This checked that both the consultation and the referral for investigation had been recorded.

A 10 per cent sample of the medical record envelopes held by the practice was searched for evidence of hospital contact, and this was compared with the research record.

In all cases where the research record of a hospital referral was not matched by a referral card and vice versa, a search was made of the patient's medical record envelope for confirmatory evidence of a hospital referral.

## Results

### *Sources of error*

Failure to complete the research record was detected at 1 per cent of consultations. Of 480 medical record envelopes searched for evidence of hospital contact, 11 con-

tained evidence of treatment at hospital without any record of referral from the practice. All these patients were self-referred, eight of them to accident departments on account of trauma. It is estimated that over 100 patients from the practice referred themselves to hospital without the prior knowledge of the general practitioner during the year.

At 522 consultations during the year referral to hospital was recorded on the consultation record. At the end of the year, 502 referral cards were available for analysis. Of these cards 91 were not matched by the consultation record and 111 consultation records of referral were not matched by referral cards. There was, therefore, a total mismatch of 202 records. All the medical record envelopes of these patients were searched for evidence of hospital referral with the following results:

|   |            |
|---|------------|
| Records not traced (death or migration) . . . . .                   | 31         |
| Failure to produce a referral card . . . . .                        | 70         |
| Errors in recording on consultation record—Over recording . . . . . | 8          |
| Under recording . . . . .   | 9          |
| Referral card only (correct) . . . . .                              | 84         |
| <b>TOTAL . . . . .</b>  | <b>202</b> |

The number of errors attributable to each of the three doctors was compared. No significant difference\* was detected between doctors. In addition, the direction of error, *e.g.* over or under recording, tended to cancel out. The observed difference in the rate of hospital referral by the three doctors in the practice may be regarded as real and cannot be accounted for by different rates of error in recording data.

#### *Hospital referrals*

During the year, 3,455 patients consulted the practice on 21,098 occasions. Of these, 489 (11 per cent) were referred to the outpatient department on 529 occasions,

TABLE I

COMPARISON OF OUTPATIENT REFERRAL RATES PER 100 PATIENTS AT RISK AND CONSULTATION RATES PER PATIENT AT RISK ANALYSED BY AGE AND SEX

| Age groups       | Males                |                      |                                       | Females              |                      |                                       |
|------------------|----------------------|----------------------|---------------------------------------|----------------------|----------------------|---------------------------------------|
|                  | Outpatient referrals |                      | Consultation rate per patient at risk | Outpatient referrals |                      | Consultation rate per patient at risk |
|                  | Number               | Rate per 100 at risk |                                       | Number               | Rate per 100 at risk |                                       |
| Under 5 ..       | 9                    | 4.9                  | 5.9                                   | 9                    | 4.2                  | 5.5                                   |
| 5-14 ..          | 36                   | 12.5                 | 3.5                                   | 24                   | 8.0                  | 4.0                                   |
| 15-24 ..         | 24                   | 8.3                  | 3.1                                   | 57                   | 16.6                 | 5.2                                   |
| 25-44 ..         | 61                   | 10.3                 | 3.1                                   | 88                   | 15.6                 | 4.9                                   |
| 45-64 ..         | 74                   | 12.9                 | 4.8                                   | 71                   | 12.1                 | 5.2                                   |
| Over 65 ..       | 40                   | 18.8                 | 6.3                                   | 36                   | 11.1                 | 7.1                                   |
| <b>TOTAL ...</b> | <b>244</b>           | <b>11.5</b>          | <b>4.1</b>                            | <b>285</b>           | <b>12.2</b>          | <b>5.0</b>                            |

giving an overall referral rate of 11.9 per cent. Fifty-eight patients (1.3 per cent) were admitted as emergencies to hospital on 62 occasions, giving an overall admission rate of 1.4 per cent.

The outpatient referral rates analysed by age and sex are compared with the consultation rates in the practice in table I. The highest referral rate is recorded for males over 65 years of age and the lowest for males and females under the age of 5 years. Between 5 and 14 years, more males than females were referred to hospital, but this

\*Significant difference in this paper indicates  $p < 0.05$ .

trend is reversed in the age groups 15–44 years. Thereafter, the male referral rate is higher than that for females.

#### *Social class*

There was a significant association between age and social class in this practice. After adjustment for age, the outpatient referral rates analysed by social class showed a marked gradient from 11.1 per cent in social class V through 12.8 per cent in social class III to 17.3 per cent in social class I. A similar pattern was not demonstrated for patients admitted to hospital. The highest rate for admission was found in social class III, 1.9 per cent, followed by social class V, 1.8 per cent, with the lowest rate in social class II, 0.3 per cent. The total numbers admitted were, however, very small for meaningful conclusions to be drawn.

#### *Comparison of referral rates of three doctors*

The referral rate had been calculated for each of the three doctors and is expressed per 1,000 consultations during the year. In order to relate those rates to other variables studied at each consultation, the data used in this part of the study were restricted to those recorded at every consultation and analysed by computer. In this way 451 referrals to outpatients were recorded, 130 by Dr 0, 113 by Dr 1, and 208 by Dr 2. These differences when related to the number of consultations by each doctor during the year are highly significant ( $p < .001$ ). Expressed as rates per 1,000 consultations they vary from 15.40 for Dr 0, through 22.4 for Dr 1, to 27.3 for Dr 1.

#### *Adjustment of referral rates*

A relationship has been demonstrated between age, sex and social class and the rate of referral to hospital. In addition, a relationship has been demonstrated between the diagnosis recorded at a consultation and referral rate (table II), and between the type of consultation, *i.e.* whether initiated by patient or doctor, and referral rate. During

TABLE II  
OUTPATIENT REFERRAL RATES PER 100 CONSULTATIONS ANALYSED BY TWENTY DIAGNOSTIC GROUPS

| <i>Diagnostic groups</i>                                       | <i>Number of consultations</i> | <i>Outpatient referral rate per 1,000 consultations</i> |
|--|--------------------------------|---|
| Communicable diseases .. .. .                                  | 551                            | 9.1   |
| Neoplasms .. .. .  | 353                            | 70.8  |
| Allergic, endocrine and metabolic disorders .. .. .            | 866                            | 9.2   |
| Diseases of the blood .. .. .                                  | 289                            | 10.4  |
| Mental, psychoneurotic and personality disorders .. .. .       | 2,534                          | 11.4  |
| Diseases of the nervous system .. .. .                         | 581                            | 27.5  |
| Diseases of the eye .. .. .                                    | 343                            | 67.1  |
| Diseases of the ear .. .. .                                    | 607                            | 13.2  |
| Diseases of circulatory system .. .. .                         | 1,414                          | 22.6  |
| Respiratory diseases (acute) .. .. .                           | 4,140                          | 7.2   |
| Respiratory diseases (chronic) .. .. .                         | 1,173                          | 10.2  |
| Diseases of digestive system .. .. .                           | 1,656                          | 34.4  |
| Diseases of genito-urinary system .. .. .                      | 928                            | 34.5  |
| Pregnancy .. .. .  | 344                            | 174.4   |
| Diseases of skin and cellular tissues .. .. .                  | 1,462                          | 16.4  |
| Diseases of bones and organs of movement .. .. .               | 1,450                          | 32.4  |
| Congenital malformations and diseases of early infancy .. .. . | 44                             | 90.9  |
| Symptoms and ill-defined diseases .. .. .                      | 266                            | 11.3  |
| Accidents, poisoning and violence .. .. .                      | 1,075                          | 28.8  |
| Prophylactic and administrative procedures .. .. .             | 1,018                          | 1.2   |
| TOTAL .. .. .  | 21,094                         | 21.4  |

the year, the doctors were each consulted by differing numbers of patients in different age, sex, social class and diagnostic groups. Each doctor's referral rate has been adjusted for each of these variables individually by calculating expected rates by applying the overall practice referral rates for each group to the number of patients consulting each doctor in each group. The adjusted rates (table III), still reveal significant differences

TABLE III  
REFERRAL RATES PER 1,000 CONSULTATIONS ANALYSED BY THREE DOCTORS AND ADJUSTED FOR DIFFERENT CONSULTATION CHARACTERISTICS

| <i>Adjustments of referral rates</i>      | <i>Doctor 0</i> | <i>Doctor 1</i> | <i>Doctor 2</i> |
|---|-----------------|-----------------|-----------------|
| Referral rates unadjusted .. .. .         | 15.44           | 22.39           | 27.25           |
| Adjusted for age and sex .. .. .          | 15.99           | 22.03           | 26.23           |
| Adjusted for social class .. .. .         | 15.22           | 22.35           | 27.09           |
| Adjusted for diagnostic groups.. .. .     | 16.54           | 22.92           | 25.23           |
| Adjusted for type of consultation .. .. . | 15.87           | 21.87           | 26.74           |

between the doctors' referral rates, although for some of the variables, *e.g.* diagnosis, the differences are reduced.

#### *Reason for referral*

At every outpatient referral the doctors recorded the department to which the patient was referred and the reason for referral expressed as 'diagnosis only', 'treatment only', or 'diagnosis and treatment'. The most frequently used department was surgery, at 18 per cent of referrals, followed by medicine, orthopaedics, obstetrics and ear, nose and throat departments (table IV). The three doctors varied widely in their use of different departments.

TABLE IV  
REFERRALS BY THREE DOCTORS ANALYSED BY PERCENTAGE REFERRED TO DIFFERENT DEPARTMENTS, COMPARED WITH FIGURES CALCULATED FROM THE ANNUAL REPORT OF THE DEPARTMENT OF HEALTH AND SOCIAL SECURITY (1968). (CASUALTY FIGURES EXCLUDED)

| <i>Departments</i>                 | <i>Doctor 0</i> | <i>Doctor 1</i> | <i>Doctor 2</i> | <i>All referrals</i> | <i>D.H.S.S. annual report, 1968</i> |
|------------------------------------|-----------------|-----------------|-----------------|----------------------|-------------------------------------|
| Medicine .. .. .                   | 8               | 19              | 15              | 14                   | 16                                  |
| Surgery .. .. .                    | 14              | 24              | 16              | 18                   | 16                                  |
| E.N.T. .. .. .                     | 12              | 9               | 11              | 11                   | 10                                  |
| Ophthalmology .. .. .              | 5               | 9               | 6               | 7                    | 9                                   |
| Gynaecology .. .. .                | 6               | 5               | 4               | 5                    | 7                                   |
| Obstetrics .. .. .                 | 12              | 6               | 16              | 12                   | 8                                   |
| Paediatrics .. .. .                | 3               | 3               | 1               | 2                    | 2                                   |
| Psychiatry .. .. .                 | 6               | 5               | 5               | 5                    | 3                                   |
| Orthopaedics and physical medicine | 15              | 11              | 13              | 13                   | 19                                  |
| Dermatology .. .. .                | 7               | 6               | 8               | 7                    | 6                                   |
| Others .. .. .                     | 11              | 3               | 5               | 6                    | 4                                   |
| TOTAL .. .. .                      | 99<br>=146      | 100<br>=129     | 100<br>=202     | 100<br>=477          | 100<br>=6,965<br>thousand           |

The reason for referral varied with different departments. Over 60 per cent of the patients referred to the ENT, orthopaedic and physical medicine departments were judged by the doctors to be referred for treatment only, a diagnosis having been made. This fell to 25 per cent of patients referred to the department of medicine and 10 per cent of

those referred to the paediatric department. By contrast, the departments of medicine, paediatrics and ophthalmology were most frequently used for diagnosis only. The doctors differed in the proportion of patients they referred for diagnosis, treatment and diagnosis and treatment (table V). These differences were highly significant ( $p < 0.01$ ).

TABLE V  
REASON FOR REFERRAL ANALYSED BY THREE DOCTORS PER 100 REFERRALS

| Reason for referral             | Per 100 outpatient referrals |          |          |
|---------------------------------|------------------------------|----------|----------|
|                                 | Doctor 0                     | Doctor 1 | Doctor 2 |
| Diagnosis only .. .. .          | 4.6                          | 12.5     | 11.1     |
| Treatment only .. .. .          | 57.6                         | 38.9     | 59.4     |
| Diagnosis and treatment .. .. . | 37.1                         | 47.9     | 29.5     |
| Other .. .. .                   | 0.7                          | 0.7      | —        |

Drs 1 and 2 referred similar proportions for diagnosis only and Drs 0 and 2, similar proportions for treatment only.

#### *Diagnostic and therapeutic activity*

The three doctors have been compared in respect of four other variables in table VI. Drs 1 and 2 used open access facilities for laboratory and x-ray investigations at about

TABLE VI  
A COMPARISON OF THE DIAGNOSTIC AND THERAPEUTIC ACTION OF THREE DOCTORS PER 1,000 CONSULTATIONS

| Diagnostic and therapeutic action                                   | Per 1,000 consultations |          |          |
|---|-------------------------|----------|----------|
|   | Doctor 0                | Doctor 1 | Doctor 2 |
| Physical examination of 1 system of the body .. .. .                | 622                     | 516      | 498      |
| Physical examination of 2 or more systems .. .. .                   | 32                      | 72       | 71       |
| Laboratory and x-ray investigation .. .. .                          | 18                      | 50       | 49       |
| Prescription issued .. .. .   | 714                     | 682      | 728      |
| Certificate issued (consultations for males age 15-65 only) .. .. . | 342                     | 395      | 373      |

5 per cent of consultations compared with Dr 0, who used these at 1.8 per cent. Drs 1 and 2 also resembled each other in the proportion of consultations at which the patient was examined and the extent of the examination and, again, differed from Dr 0. There was little difference between the doctors in the proportion of consultations at which they issued a prescription or National Insurance certificate.

## Discussion

### *Sources of error*

Carstairs and Skrimshire (1968) compared the hospital referral rates reported in 20 different studies and considered in some detail the effect of the definitions used and the sources of the material on the rates reported. They also discussed the sources of error in HS10 returns. They were not in a position to consider the contribution of error to variations reported in studies carried out in general practice.

At 1 per cent of the consultations which took place in this practice during the year, the methods used for detecting error revealed a failure to record the consultation. No comparable attempt to detect error in studies in general practice has been encountered, but it is suspected that this is a low level of error. This is attributed to the method which ensured a high degree of co-operation between receptionist and secretary, in extracting

data within 24 hours of recording, and insisting that no consultation should be undertaken without the patient's medical record envelope being made available.

Errors of under and over recording hospital referrals were detected at 3 per cent of consultations at which such recording was appropriate to the consultation record. This is, in part, due to the design of the research record (figure 1). For a series of variables relating to each consultation, the doctor was required to code 0, 1 or 2 in consecutive spaces. It was not difficult in completing the record under pressure to carry over, for instance, the code 1 from one space to the next.

At 13 per cent of consultations at which a patient was referred to hospital, the doctors failed to raise the requisite hospital referral card. It seems probable that this was a result of making excessive demands on the doctors. It was noted at other points in the study that when a doctor was asked to do something extra, *e.g.* timing consultations, the rate of errors in his recording rose dramatically. It is probable that a record which is completed at every consultation is likely to become a habit, whereas the raising of a special record in special circumstances may be easily forgotten.

At 15 per cent of consultations the patient was referred to hospital for a diagnosis other than the principle diagnosis on the consultation record. This illustrated the difficulty of combining a work study with a morbidity study noted by Lees and Cooper (1963). For a variety of reasons it was decided to record only one diagnosis for each consultation, priority in the selection of this diagnosis being given to that relating to the presenting symptom. Studies designed for multiple purposes in this way may lead to under recording of a second variable which is given a lower priority, unless special arrangements are made. The hospital referrals which, in this context, may be described as incidental to the consultation were atypical and included a large proportion of patients referred for such conditions as hernia, tonsillar hypertrophy and varicose veins, and two patients referred for rodent ulcers.

The finding that 16 per cent of patients were self referred and thus could never appear on the practice record was a surprise and the large proportion of them, due to trauma, must lead to under recording in the use of this type of hospital care in general-practice studies. It is important to recognize that this study was conducted in the centre of London where large casualty departments provide a 24-hour service and this bias is likely to be less important in rural areas.

The size of errors revealed in this study where the training and support given to the recording doctors was above average, does raise the possibility that some of the differences in hospital referral rates reported between different practices may be due to varying rates of error in recording, particularly when the recording of hospital referrals is incidental to and not the main objective of the study.

#### *Referral rates*

The referral rates reported in this paper are much higher than those reported by Fry (1959) and reveal a slight excess in females. It lies midway in the range of referral rates described by Starey (1961). The rate expressed as 2.5 per 100 consultations is lower than that reported by Wright (1968), 3.2 in South-west England and by Williams (1970) 3.5 in South Wales. Twelve per cent of the patients in the practice were referred either as direct admissions or outpatients during the year. This does not reflect the total contribution of the hospital to the care of the patients in the practice. Nine per cent of the patients in the practice reported at the time of consultation with the general practitioner that they were currently attending the hospital outpatient department. Some of them were patients who had been referred during the year, but a proportion were being followed-up from hospital referrals which took place prior to this study.

Males who had the highest consultation rate in the practice (65 years and over) also had the highest referral rate. Males under 5 years who had the second highest

consultation rate had the lowest referral rate. A different pattern was found in females. The highest consultation rate was again recorded in those aged 65 and over, but they had low referral rates compared with females in the age group 15–44 years. The females under 5 years had the lowest referral rate. These patterns are in keeping with the findings of Palmer *et al.* (1969), who studied the hospital usage of a sample of the population from which this practice is drawn and noted that men over 55 years and women in the child bearing years were the highest users of hospital services. The findings in respect of social class differ from those of Palmer and his colleagues in that a social class trend for outpatient referral falling from social class I to social class V is demonstrated. A possible explanation for this discrepancy may be the finding that this trend was reversed in the patients who reported that they were currently attending hospital. The interpretation of these findings could be that more patients in the higher social classes are referred to hospital, but they are followed up for a shorter period of time, so that in a study of hospital usage such as that designed by Palmer *et al.*, the higher referral rates in the upper social classes could be off-set by the more prolonged follow-up in the lower social classes.

The comparison of referral rates per 1,000 consultations analysed by different disease groups reveals very wide differences between, for instance, patients diagnosed by the general practitioner as suffering from neoplasms or diseases of the eye and patients suffering from acute respiratory or communicable diseases. This demonstrates the marked difference in the patterns of illness seen in the general practitioner's surgery and the hospital outpatient department.

#### *Differences in referral rates*

Widely different referral rates were demonstrated for the three doctors working in this practice. Ryle (1960) found some evidence of selective recruitment of neurotic patients to his practice, because of his known interest in neurosis. There was evidence that the three doctors in this study saw different numbers of patients in different age, sex and social class groups and diagnosed different diseases with varying frequency. The hypothesis was made that the differences in referral rate were due to these variations. Standardization of the referral rates for each of these variables individually does not support this hypothesis.

Looking for other explanations for the differences in referral rates demonstrated, it is apparent that Drs 1 and 2 resembled each other and differed from Dr 0 in the extent of the physical examination they conducted at each consultation. There was also a close similarity in their use of laboratory and x-ray facilities. This relationship between a high usage of these facilities and high referral rates has been described elsewhere by Beckett *et al.* (1966).

The percentage distribution of referrals to different departments by the individual doctors and by the practice have been compared in table IV with figures calculated from the Annual Report of the Department of Health and Social Security (1968). In preparing this table, referrals to casualty and accident departments have been excluded owing to deficiencies in our data. The overall practice figures were similar to the national figures, but there were wide variations between the individual doctors. There is some evidence that the doctors tended to refer more patients to those departments in which they themselves have a special interest and postgraduate experience. This supports the observation of Evans and McBride (1968) of higher than expected referral rates of a doctor in a group practice with a special interest in paediatrics and dermatology to these two departments. These authors also noted an inverse relationship between a doctor's age and his referral rate to hospital which we have observed. Walton (1968) has shown that older doctors tend to be more tolerant of diagnostic uncertainty than younger doctors. If this is relevant to the differences described in this paper, Dr 0 might be expected to refer the smallest number of patients for 'diagnosis only' and this was recorded.

Finally, a doctor's skill in the primary diagnostic situation should be influenced by



his experience in general practice, and of more importance, perhaps, his experience with a particular practice. In this practice, Dr 0 and Dr 1 had 11 years experience in general practice, compared with Dr 2, who had five years experience. Dr 0 had spent his entire practice life in the one practice, while Drs 1 and 2 had joined this practice at the beginning of the study year. If these factors are relevant to the rates of referral to hospital it might be expected that the doctors' referral rates would change as they became better acquainted with the practice. Records maintained over seven successive quarters do not reveal any such change, but the time period is too short to draw any conclusions.

It seems probable that a doctor's decision to refer a patient to hospital reflects his perception of the need for hospital care which may, in some cases, be related to his intolerance of diagnostic uncertainty. Further studies of the hospital records of the patients referred during this study are being undertaken in an attempt to clarify this problem, but it is likely that final conclusions can only be reached by studying those patients who are not referred to hospital.

### Summary

A detailed study of the rates of referral to hospital by three doctors in a group practice is described. A hypothesis that the observed differences were due to the different age, sex, social class and diagnostic characteristics of the patients seen by the individual doctors was not substantiated. The possibility that a doctor's age and the duration of his experience in a particular practice is inversely related to his referral rate to hospital is examined.

### Acknowledgements

We wish to express our gratitude to Miss J. Spashett and Mrs A. Kenward who ensured that patients' records were completed and extracted during this study, to Mr S. G. Nicholas for help in preparing the data for analysis and to Dr Z. Roth for statistical guidance. Professor W. Holland advised and encouraged us in this work. The cost of the study was defrayed in part by the Department of Health and Social Security.

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