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THE IMPLICATIONS OF THE GP REFERRAL SYSTEM FOR HEALTH AUTHORITY PLANNING: SOME OBSERVATIONS AND THE RESULTS OF A SURVEY

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1. Introduction

1.1 Scope of the paper

In this paper we discuss the role of GP referral practice in relation to planning in a District Health Authority. The main threads of the paper will be woven around the simple, but fundamentally important, observation that it is the GP who acts as the main gatekeeper for controlling the access to and availability of acute health care in Britain. At the same time there is an appalling lack of information and understanding, particularly in the local context, of the relationship between general practice and acute care. This situation will be commented upon and suggestions for improvements will be made at various stages of the paper.

The paper takes the following form: in the rest of this introduction we outline why we consider the GP referral system as of significant importance in DHA planning. Sections 2 and 3 centre around a pilot survey of GP referral behaviour in a DHA in the north of England. The design of the survey is outlined and some comments concerning the practical difficulties in undertaking such a survey are made. We then proceed to analyse the results of our survey. Here we are interested in determining which factors are important in the decision to refer a patient to a particular consultant at a particular location. For the purposes of our survey we focused on just two specialties, general surgery and ENT. We justified this on the grounds that general surgery traditionally has long waiting lists for in-patients (this being a common proxy for demand). ENT was chosen because in-patient facilities for this specialty were not available in the DHA we studied, although proposals exist for their future development. The final section makes some recommendations as to how the referral process could be understood and analysed at the DHA level and some of the benefits of this knowledge.

1.2 Importance of the referral process

About 85 to 95 percent of patients who utilize hospital facilities have first consulted their GP and have consequently been referred to a specialist clinician in a hospital. In theory the GP has the freedom to refer a

patient to any hospital he or she chooses, and the consultant has the right, in theory, to accept or refuse to treat any patient sent.

Now, it may well be that over a number of GPs and over, say, a time period of a year, referral rates and patterns crystallise into some coherent and stable form. If they do, we are concerned with the nature of these regular patterns and why they take the form they do. Referral rates are widely reported to be extremely variable (Morrill et al, 1971; Fry, 1959). We want to know what influences these variations in referral behaviour of individual GPs and groups of GPs in a given region or district. What might be the major enabling and constraining factors on the making of referral decisions? Then, in the field of planning there is the more important problem relating to the affects on referral patterns of a change in the pattern of health care supply in a given district, or even in an adjoining one.

Our response is that these questions cannot at the present time be answered with information that is available to a DHA. Experience suggests that planning of acute care facilities in a district makes simple assumptions about future levels of demand because this is the best that can be done. It is difficult to estimate the impact on referral rates and patterns of a change in the level of provision of acute or out-patient facilities. We suggest that a lack of understanding of the referral process is a major shortcoming to the forecasting of future levels of demand for health care.

GPs come under the control of the Family Practitioner Committee which is structurally and financially independent of the DHA and may not even have coterminous boundaries with it. This autonomy may be one reason why there appears to be little systematic collection of information on the referral process. GPs have only limited involvement in district health service administration and are disinclined to collect statistics for which they themselves have little use.

At a national level the picture is correspondingly bleak. The only recent survey of GP referral behaviour was undertaken in the early '70s - Morbidity Statistics from General Practice, 1970/71, 1971/72, (OPCS, 1977, 1979). This small survey mainly concentrated on morbidity but an ancillary aim was to investigate referral rates by condition. However, little use of

this information can be made because of the widespread variation in GP behaviour. Also, there existed a bias in the survey towards rural GPs and only limited numbers were surveyed in any one part of the country. If, as we claim, the referral process is so important why is there no routine, systematic recording of referral rates by GPs? The answer is not simple. We have already mentioned the problem of different administrative systems and this is probably a major contributing factor. Another problem is that on the HAA form there is a place for the recording of GP identity, but in Yorkshire RHA, for example this is not coded and therefore not recorded. In any case, we shall argue that data collection should be centred around the GP as well as the hospital. Finally, on a practical level, the GP's resistance to further incursions into his or her time is probably also a significant factor in the paucity of available information.

In concluding this introductory section we would just like to re-emphasise our aims. We are concerned to find out why a GP refers a particular patient with a given set of characteristics to a particular consultant at a particular hospital, and to what extent medical and non-medical factors such as distance and accessibility, and waiting lists and the range of alternatives available, are important. In aggregate these decisions will determine the demand for health care at particular locations and as a consequence be a prime determinant of resource consumption. We believe this to be an important topic of research.

The imformation elicited by this survey is, by its nature, subjective. The GP is being asked to identify factors considered to be relevant when deciding where to refer a patient and these will vary, being affected by such things as patient factors, and the GP's own knowledge and opinions of consultants and hospitals. The analysis of the results may show the relative strengths of the factors identified by the survey. Despite this, the information recovered from this type of inquiry can throw useful light on the operation of the referral system and highlight potential areas of its operation which might be improved upon or may be less important than assumed.

2. The structure and execution of the survey

The DHA under study has a population of 164,000 and is served by three general hospitals. At the time of the study there are 72 GPs and one trainee in a mixture of solo and multiple practices. All of them were approached and asked if they would take part in the study which involved recording for us the referrals they made over a four week period to consultants in the specialties of general surgery and ear, nose and throat (ENT). A lack of time and resources precluded a more extensive study covering referrals to other specialties.

The questionnaire was designed by research team members in the departments of Geography and Community Medicine at the University of Leeds and piloted by some volunteer GPs before being distributed in the DHA. With the success of the survey dependent on the number of GPs recording referrals, a prime consideration was to make the questionnaire as simple to understand and complete as possible. In addition, it was decided that each GP would be individually seen by an interviewer in order to explain what the survey was about and to encourage the doctor to participate.

The questionnaire was divided into six sections (see Appendix). The first completed by the interviewer, sought details on the GP such as number of years as a principal in general practice, list-size, and whether or not a hospital appointment was held. The remainder of the form was left with the GP to be filled in over a four week period, during which time all ENT and general surgery referrals (other than for lab tests or X-rays) were to be recorded. Information was requested on the provisional diagnosis and age of the patient and then the GP was asked to tick one or more reasons for that referral. We wanted to know if the referral was an emergency and about the clinical factors affecting the referral decision such as whether the severity of a condition or the fact of it deteriorating had made referral the proper medical decision under the circumstances. The GP could add other factors to the list. If there was a choice of referral between the consultants for that specialty in the district the doctor was asked to specify which consultant had been chosen and if the other had been considered as alternatives. Under patient factors in referral choice we wanted to find out if the convenience of the patinet's residence or workplace to the consultant was offered as a reason for referral or if a patient's own

request for a particular consultant was taken into account. The final section dealt with health service factors which were thought might influence the GP's decision such as waiting lists, and the opinion of hospital services and consultants. This might be a professional or non-professional judgement and was intended to pick up whether GPs hold an idea of the consultant when they refer or whether referrals stemmed mostly from habit. The ease of admission if the referral was an emergency was also considered. There was additional space for doctors to add their own comments or mention other factors which had not been specified. Planning and execution of the survey occupied nearly four months from the initial interviews with GPs were until the last questionnaires were returned. The main period GPs were recording was between February and April. Although they were being asked to record for a four week period only, the intervention of holidays, illness, and delays due to work pressures meant that the same four weeks were not common to all participants. This was not regarded as unduly important, however, as neither ENT nor general surgery referrals are considered to be seasonally influenced.

With the cooperation of GPs an essential feature of the project, approaches were made early to the Local Medical Committee and to the area Family Practitioner Committee for their advice and comment. It was, however, up to the individual doctors to choose whether or not to participate. Of the 72 doctors in the district some 22 either refused outright or were unable to arrange a time to see us. Of the remaining 51 interviewed most expressed interest in our aims but only 26 actually completed any recording for us. Why this turned out to be the case is largely a matter for speculation. Had there been more time available, more follow-up visits might have encouraged completion; so might the provision of some financial reward (one doctor refused to take part on these grounds). Some doctors found that they did not have the time to complete the records, one or two admitted they had forgotten about them. In the cases of those refusing or not completing the questionnaire there is no information available either on their referral patterns or on their practice characteristics. It would have been interesting to analyse these for non-participants but information on this list-sizes or experience in general practice was often not made available to us. However, some general observations can be made on the characteristics of GPs taking part and there is some information available on the remainder (see Table 1). On the basis

of completed questionnaires the response rate was 37% with above average representation for GPs in solo practices and those with more than two doctors. In the DHA as a whole there are 9 single, 8 double, and 13 multiple practices respectively. Doctors with a wide range of list sizes took part and there was also wide variation in the number of years in practice from newly-qualified to near-retirement.

The small data set allows no firm conclusions to be drawn on the GP characteristics or their practices but there is an obvious preponderance of younger doctors taking part. Doctors in multiple practices were more likely to take part and a large proportion of them had list sizes at or above the national average of 2500. It may be assumed that these are among the busier GPs in the district and it indicates that given the right approach and questionnaire doctors may well find time to cooperate in such surveys.

3. Total referral rates

Over a period of four weeks the survey yielded information for a total of 205 referrals; 63 to ENT and 142 to general surgery. Twenty of these were referred out of the Authority to surrounding DHAs. Given that there are 72 GPs in the DHA under study we may estimate gross referral rates over a year based on those GPs surveyed. For ENT the estimate that 1792 out-patients will be referred compares reasonably well with the 2275 recorded new out-patients attending clinics in the district in 1983. For general surgery a similar extrapolation from the data gives an estimate of 3744 OP referrals and this compares with the recorded total in 1983 of 3152. At this aggregated level therefore the errors are of the order of 20%. Referral rates for individual GPs were found to range from a total of only one in four weeks to 23 in the same period. Individual ENT rates vary from 0 to 8, and for general surgery from 0 to 22. These rates are shown in Figure 1.

Given that the referral behaviour of the set of GPs surveyed is reasonably typical of the DHA as a whole, and also considering that high referrers tended to consistently refer more patients than low referrers throughout the survey (the date of each referral was given in the questionnaire), we can surmise that the variations in the individual

referral rates presented above are representative of the range of referral behaviour among GPs in the longer term. The range of annual rates of referral to ENT and general surgery clinics and departments is from 12 per year to 276 per year. The implications of this for hospital utilization is clear. Individually GPs generate very variable demands for hospital resources. From one year to the next, however, this apparently chaotic behaviour at the level of the GP resolves itself into stable figures for the number of new out-patients attending hospitals in the Authority as a whole. Although GP referrals are not formally regulated at the level of the making of referral decisions there are, it seems, effective controls inherent in the referral system at the level of the hospital which equalize the demand for resources.

In an attempt to understand how these controls function, we set out a series of illness, patient, and health service factors which were felt to be pertinent to the referral decision and these constituted the questions put in the questionnaire.

3.1 Analysis of referral rates

The median rate over the survey period is 6 referrals. That is, on this data, the average GP in this DHA refers 72 patients per year to ENT and general surgery. Figure 1 shows that the distribution of referral rates is skewed towards the lower range of rates (skewness value = 1.14) and also that there seems to be only a tenuous relation between referral rates to general surgery and referral rates to ENT (R squared = 0.1789). High referrers to one specialty may be low referrers to another. On the strength of these data it would seem not only that GPs have widely varying aggregate referral rates, but that these aggregate rates are composed very differently from doctor to doctor. This may of course simply reflect the way in which morbidity at a local scale is stochastic in nature rather than necessarily reflecting GP-behaviour.

We begin the interpretation of the variations in rates of referral by relating them to some generalized biographical detail (the number of years in general practice) (Figure 2) and practice characteristics (list-size and

practice size) of the GPs (Figure 3).

Statistically the relationship between the age of the GP (approximately) and the number of patients referred is extremely poor (R square = 0.02797). Older GPs appear to refer slightly fewer patients, but the data is very scattered and there are obvious exceptions. Experience in dealing with the medical problems in general practice appears therefore to have no direct effect on referral behaviour. Nor can any relationship be drawn between concern over diagnostic uncertainty (the main factor motivating referrals for second opinions and investigations) and age.

GP list-size plotted against referral rate gives virtually randomly scattered data (R squared = 0.0030). Although GP workload may well affect referral rates, list-size is an extremely poor measure of workloads. Butler (1980) reported a similar non-correlation.

The relationship between referral rates and practice size is similar to the two factors above (R square = 0.07592) though as we shall see later GPs in larger practices seem to refer more patients. Certainly almost all high referring GPs worked in a medium sized or large multiple practice of 3 to 5 principals (see Figures 7 and 8). It does not follow however that all GPs in large practices show higher referral rates. Rather, those GPs with a propensity to high referral rates may tend to work in practices with other high referrers. This is paradoxical since larger practices are often above to provide some ancillary services such as a practice nurse, and can consequently take on some of the functions normally located in the hospital. The results show the opposite effect, lending more credence to the notion that higher levels of specialization and access to investigative procedures tend to alert GPs to a wider range of pathologies and thereby push up referral rates. On the level of planning policy we can infer that trends towards larger health centres, far from reducing demand for hospital resources, will actually tend to increase that demand. On the limited evidence available here it also appears that solo GPs tend to be relatively low referrers.

The GPs surveyed felt that in 70% of referrals (143) to general surgery and ENT there was a choice in where to send the patient. This

emphasises the point we made in the introduction that the spatial variation in the demand for inpatient care is a reflection of GP behaviour.

3.2 The medical reason for referral

Responses to the questions relating to the patient's illness; severity of illness; the actual deterioration of the illness; and the failure of the GP's own treatment, are tabulated and analysed in Table 2. Of particular interest were the incidences, reasons for, and consequences of non-referral. Since referral rates varied enormously there must be a large group of patients who would be referred by one GP but not by another. Planners are especially concerned with this possibly significant number of patients because they represent a changeable (if GP referral characteristics could be altered) demand base for hospital facilities. This survey gathers some information on those patients not referred by finding how many consultations were return consultations where treatment had been unsuccessful (the 'failure' and 'deterioration' factors) and the patient was only referred after the second consultation. From this we may gain some idea of the repercussions of non-referral on the quality of care. Higher rates of non-referral (more patients being retained in general practice) might lead to higher levels on unsuccessful treatment in general practice and consequently to a decreasing quality of service. In terms of the patient's discomfort and the costs to the Health Service this would clearly be an undesirable trend in medical practice.

With the three factors: 'severity', 'deterioration', and 'failure', we have attempted to evaluate how and why the medical decision to refer is made. Table 2 shows the occurance of reasons for referral, along and in conjunction with one or both of the other factors. Twenty-two percent (45) of referrals were made for reasons other than those given in the questionnaire. Typically these were referrals for investigations and for prophylactic procedures. Quite clearly 'severity' is the most important factor but we also find that quite a significant proportion of patients are treated unsuccesfully in general practice ('deterioration' and 'failure' factors). From this one could argue that easier access to out-patients appointments would prevent these possibly harmful delays (non-referral being a function of access) - on the other hand consultants might argue that many trivial conditions are sent to hospital and that for this reason

no improvement in access need be made. It would be useful to get comparable figures from other districts to find whether medical practice is indeed affected by access in this broad sense or whether this level of unsuccessful treatment is a stable feature in general practice. Also it is necessary to be aware that all these factors ('severity' and so on) vary over different specialties, 'deterioration' and 'failure of treatment' being usually more significant in medical specialties than in surgical specialties.

The actual incidence of the factors 'severity', 'deterioration', and 'failure' by specialty (general surgery and ENT) shows no discernible pattern.

3.3 Reasons for referral related to the age of the patients

One of the more substantive findings of past work on referrals is that rates vary with the age of the patient (cf. Fry, 1977 and Morrell et al, 1971). In these studies middle-aged women and males over 65 tend to have the highest referral rates, although why this should be has not been investigated. No information was collected in this survey on the sex of patients but Table 3 shows that in the district studied referral rates were highest in the 5 to 14 year old cohort (132 per 1000 population/year). It is possible to go some way to distinguishing why rates of referral vary with age by relating them to the 'reasons for referral' employed in the analysis above. The relative importance of these factors with age is shown in Figures 4, 5 and 6.

The survey showed that 'severity' was especially important in determining referral among the young (up to 14 years old) and the old (over 64s). This is mainly a consequence of the higher incidence of prophylactic procedures and disease monitoring (vasectomies and investigations for breast lumps and so on) among mid-age groups, which are all non-severe, but it may also be connected with the differences in morbidity profiles or in the objective requirements for care of these age groups.

Deterioration of a condition appears to be a major determinant only for referral among age group 2 (5 - 14 years) where it was given in nearly 50 per cent of cases. Among other age groups it was cited as a factor in between 20 and 40 per cent of referral events. This variation may have several explanations. First, the incidence of prophylactic and

investigative procedures is an influence on mid-age group data. Second, children and adolescents may present to the GP earlier in a disease episode than older groups. Third, the care which is available at home to most children may have some effect on the making of referral decisions. In view of this GPs may be less inclined to refer young patients to hospital, particularly as inpatients.

The relation of 'failure' to the age appears to describe no discernable pattern, other than that a relatively small percentage (13.1%) of 35 to 64 year olds, and a comparatively high percentage of 5 to 18 year olds (42.3%) were referred for this reason. It is tempting to ascribe this to the same patterns described above in the discussion of the factor 'deterioration'.

To summarize, referral rates and the reasons for referral vary with age in ways which may be due to health needs and/or patient and social factors. These have been discussed but cannot at this stage be evaluated any more clearly.

The implications for planners are that on these calculations roughly a third more young (up to 18) and old (over 65) people will present at out-patient clinics and they will more often have deteriorating conditions which general practice has treated unsuccessfully. Their needs for urgent appointments may therefore be correspondingly higher.

3.4 Medical reasons for referral disaggregated by GP

The frequencies of these factors were disaggregated by GP and plotted as percentages of the number of patients referred to see if a pattern relating to a 'style' of medical practice would emerge. Given that we have identified connections between the three factors: 'severity'; 'deterioration'; and 'failure', at a coarse level, how far are these reflected in the way individual GPs make their referral decisions? Through time, which elements of the referral decision are most commonly decisive for a given GP? The data is too limited to extend this idea into an analysis of which combinations of factors most frequently determine referrals, but if suitable methods could be developed to do this type of study a very detailed picture of the content of practice could be drawn.

Only 5 out of the 25 GPs produced a pattern in their reasons for referral which conformed with the generalized frequency distributions commented on above: severity most often, followed by deterioration and failure. Almost every combination of the three factors is reflected in the survey results, suggesting a whole variety of ways or 'styles' of medical action. Some GPs were concerned only with the severity of illness, for one GP failure of treatment affected 70% of his referral decisions, for others failure was not recorded at all. Deterioration also ranged from being a factor in 70% of referrals to going unacknowledged.

3.5 Convenience of the hospital consultation for the patient as a factor in referral

Nineteen GPs completed the second page of the questionnaire, and gave convenience as a factor in 36% of referrals, although here too the rates vary among individual GPs. Eight GPs gave it as a factor in 50% or more of their referrals, while the rest (11 GPs) considered it in less than 30% of referred cases. When this pattern is plotted onto a map of practice locations it shows that GPs in practices around hospital A tend to consider convenience more often (see Figure 7). For one practice at least this relates to the direction of bus services through the village relative to hospital location and an appreciation on the part of the GPs that most of their patients are dependent on public transport. More generally it may reveal the relatively small catchment area which hospital A commands. GPs who refer there may be imputed to have made some assessment of accessibility which is perhaps not considered elsewhere in the district. The choices inherent in the 'convenience' factor are probably not significant in these areas because both the main hospitals are situated very near to each other. Because of this the DHA studied does not allow any interesting generalizations to be made about the GP's conception of and concern over accessibility (in terms of distance) to the hospital for the patient. Attempts at modelling patient flows in health authorities have all taken distance as their central tenet (see Bevan, 1982; Mayhew and Leonardi, 1982) although the evidence as to how exactly distance might affect referrals remains limited.

3.6 Health service factors (Where to refer?)

We applied a q-analysis algorithm to the survey data to derive a fairly elementary connectivity matrix of the occurrence of all patient and health service factors. In this way a structure could be found in the information without having to reduce it through the use of statistical techniques. There is no space to describe the features of q-analysis here so we will limit ourselves to a brief exposition and discussion of the results without using its fairly difficult formal notation. For more details of the approach see Gould (1980) and Beaumont and Gatrell (1982).

First, a ranked distribution of the factors is given in the analysis. This is shown in Table 4. The most frequently mentioned 'other' factor affecting referral was that the patient had seen the consultant before, this was given 15 times. Both 'opinion of consultant' and 'convenience for the patient' (a measure of accessibility of the clinic from the patient's home or work-place) were more frequently given non-medical factors than 'waiting list' which was recorded as a factor in 27.4% of referrals. Waiting lists would therefore appear only to have a limited effect on referral decisions, that is, in these specialties, in this particular DHA, at the time of the survey.

As for the connectivities of between the factors, these are portrayed in Table 5. Table 5 describes the structure of patient and health service factors in affecting referral decisions. The q-values (64, 45, 42 and so on) relate to the number of common occurances which the new factor at that level has with one of the factors at a higher q-level. For example, 'choice' and 'opinion of consultant' are listed together 64 times and 'choice' and 'waiting list' occur together 45 times. In this way factors are related to each other and some measure of that relatedness is given by the q-value. The picture that this gives of the referral decision in general is slightly different from the one outlined in Table 9. 'Opinion of consultant' is still the most frequently given factor when there is a choice in where to send the patient, but the 'waiting list' factor proves to have a more consistent and systematic effect than 'convenience'. Indeed, 'waiting list' was a factor in 36% of the 'choice' listings, compared with the overall occurance frequency of only 27.4%, making it the most significant

controllable component of Health Service factors that we have assessed here. Also 'opinion of hospital' has a very strong relation with 'opinion of consultant' and due to this becomes a strong determinant in the structure of referral decision.

4. An analysis of referral outcomes

4.1 General surgery

Having analysed the responses GPs gave to queries about their referral behaviour we are now concerned how that translated to demands made on the consultants. Tables 6 and 7 are an analysis of the age and disease characteristics of the patients sent to the two general surgery consultants in the Authority studies. Out-patient referrals to general surgery were shared between consultant A who received 35.8% and consultant B who received 45.5%. The remainder, 18.7% were referred outside the Authority. In terms of the age distributions of these patients, consultant B received a slightly higher percentage from every age cohort except the over 65s, including 66% of the 5 to 35 years age group. Consultant A was however considered to be an alternative more frequently especially in the 19 to 35 age group. The conclusion to be drawn from this is that quite a distinct referral decision-making process surrounds general surgery referrals, and that consultant B is most often preferred, for a number of reasons. One is their respective waiting lists: A has a waiting time of 9 to 16 weeks whereas B's is only 1 to 3 weeks, another that they have different specialisms. A deals with all renal disorders, B with all vascular disease. GPs are well aware of this latter distinction since patients with these conditions will be referred on by the consultant concerned. In order to understand the referral patterns in this light we must know whether the factors (waiting list length and specialism) re-inforce or counter-act each other. Renal problems may, for example, be particularly prevalent among the elderly, or if morbidity characteristics are not significantly related to age, then waiting lists may turn out to be the only consistently important factor for these referrals.

By disaggregating 'Health service' factors by consultant a clearer solution to the problem appears (see Table 8).

Of all those general surgery patients for whom waiting list length was a factor, 70.4% were sent to consultant B. Considering the relative lengths of the waiting lists this is an expected result - the most urgent cases are sent to the most accessible consultant. Conversely some measure of the deterrence value of a waiting list is given by the proportion of cases where a consultant was considered an alternative (but did not receive the patient) and waiting list was also a factor in referral, i.e. the consultant was rejected, at least partly, because of the length of his waiting list. This measure gives a value of 37% for consultant A and 7% for consultant B.

Another striking feature of the results is that 60% of patients making requests for appointments with consultants were sent to consultant A and that accounted for 36% of the patients he received. Such patients, referred on their own insistence, and not necessarily on the clinical judgement of the GP are presumably the least urgent out-patient cases. By referring them to the consultant with the longest waiting list the GP is putting them 'to the back of the queue' and effectively leaving open opportunities for referring more urgent cases. Also it indicates some assessment that non-attendence by the patient with a trivial complaint is more likely the longer the patient has to wait for an appointment. Both of these explanations describe active rationing of hospital resources by the GP.

Convenience of the consultant for the patient was a factor for 27.2% of all referrals to general surgery, with consultant B being regarded as being slightly more convenient. This reflects this consultant's more frequent clinic sessions one per week at each of the three main hospitals in the Authority, compared with two per week by consultant A.

There are certain problems with the interpretation of GP response to the question regarding 'opinion of consultant'. Some GPs acknowledged this factor every time, for each consultant, while other GPs never gave it as a factor. This may be interpreted in both cases as a response to the question which complicates analysis. Overall 'opinion of consultant' was given as a factor in 55.2% of referrals and when this is disaggregated

by consultant (Table 8) neither one appears to be viewed very much more positively than the other. However, in gross figures, opinion of consultant was a factor in nearly twice as many referrals to consultant B as to consultant A. Assuming that the factor records some positive evaluation by the GP we may take approximately opposite factors, such as 'waiting list length' and 'opinion of consultant' and plot there occurance together. We might expect that they occur together infrequently, i.e. when a consultant has a high reputation the waiting list may be less important to decisions to refer. This is borne out in Table 9.

Provisional diagnoses and remakrs about signs and symptoms were codified into the ICD classification of diagnostic conditions. In an attempt to distinguish the functions of the two consultants at a broad clinical level the frequency of referral by consultant and ICD category was found. No patterns however appear to exist in the types of case referred to either consultant, at least at this level of classification. Even the renal and vascular specialites are not differentiated.

The main themes to be drawn from this section are that consultants are seen in complex and distinct ways by GPs who refer patients to them. Planners should be sensitive to these perceptions of specialized medicine and its practitioners since they have an impact on referral behaviour.

4.2 Ear, Nose and Throat

It should be borne in mind that much of the description and interpretation of referrals in this specialty is highly speculative due to the small size of the data set. Slightly high rates of referral from only one or two GPs may well completely dominate patterns, if indeed any patterns do emerge.

Two consultants (C and D) hold out-patient sessions in ENT. The survey results showed that consultant C received 34% of ENT patients and consultant D 48% (see Tables 10 and 11). Relatively a higher percentage of 6 to 18 year olds were sent to C, whereas D received significantly more from the 36-65 age group. In the majority of these latter referrals however consultant C was considered to be an alternative.

The way in which these decisions were made is clarified by Table 12. For most of the patients sent to consultant C waiting list length was not a considered factor. If the waiting list was considered (as it was in 43.1% of ENT referrals) then it was very likely that the patient would be referred to consultant D. The deterrence value (percentage of patients where waiting list was a factor but the consultant was only thought of as an alternative) for consultant C is 90.0%, for D 0.0%. Perceived convenience of the two consultants is very similar as is the number of patients they received who made requests for referral. The 'opinion of consultant' factor however shows a far wider differentiation in ENT referrals than in general surgery. In terms of disease groups received by both consultants too there is a distinction: consultant C receiving more patients with diseases of the respiratory system (tonsillitis, sinusitis, etc.) while consultant D received more with diseases of the ear and mastoid processes.

5. Conclusion

This enquiry into referral outcomes has shown that there are many details of the referral process which could be easily and usefully be collected at the level of general practice. By using quite simple categories it was possible to go a long way toward evaluating the perceptions of GPs of the provision of specialized health care in an area and how this might affect their decision to refer. Comprehensive surveys, across all the specialties and over longer periods of time would yield much inforamtion useful to planners and administrators alike. Factors like waiting lists/time and convenience can to varying degrees be altered by management and planning, but distinctions in the disease groups sent to different consultants, and the impact of waiting lists on referrals in different specialties and different age groups are all indicators useful in the everyday running of a health care system as well.

The limited coverage and timetable of the survey we conducted (26 GPs referring 203 patients to 2 specialties over 4 weeks) makes the drawing out of generalities and conclusions problematic at this stage but in this pilot study we have set out the main features of a survey into the referral system.

We find that there are basically two components in the decision to refer, both of which have been investigated. First, whether to refer; based on clinical and diagnostic factors as well as less tangible factors such as the GPs knowledge and assessment of the patient's needs, and second, where to refer: based on factors of accessibility such as distance to the hospital and the length of waiting lists, and the GPs knowledge of the local hospital system. Clearly this constitutes a highly complex decision-making field, and its analysis requires both clinical and behavioural aspects of medical practice to be appriased. In view of this, it is unlikely that the type of statistical analysis presented here will ever be entirely adequate to explain GP behaviour, theoretical schemas of medical decision-making will also need to be developed. The present understanding of referral rates and patterns is so inadequate however, that boundaries and limits of referral behaviour have still to be set. To this end more comprehensive empirical work must be done.

Following many other studies into the referral system (Berkeley, 1976; Fraser, Patterson and Peacock, 1974; Journal of Roy. Coll. G.P., 1978; Stracey, 1961) this survey showed significant variations in GP behaviour. There is a great need for both planners and administrators of health services to account more fully for this variability because of the obvious implications for resource consumption. GPs are, at base, the generators of demand for hospital services but at a local level the demand each doctor stimulates is highly variable. In terms of planning it is therefore important to know what might affect referral behaviour or what the repercussions of changes in the pattern of health services (especially in this period of rationalization) will have on the demand for hospital resources. The increasing use of information technology in health service administration and planning is an important development in this regard. The general practice of the future will have computerized medical records and information systems linked to the district's general hospitals. All the cumbersome and inaccurate paraphenalia of form-filling and so on will

be superseded by a few keyed commands into a computer terminal on the GP's desk, thus allowing a far wider range of integrated information to be recorded quickly and easily (Korner Report, 1982). We believe that this shift in information collection from being hospital to general practice-based and the corresponding change in the quality of inforamtion from being related to medical events to being related to individuals will enormously aid the analysis of the functioning and performance of the health care system. Further, with these developments in data collection, the feasibility of conducting more wide-ranging surveys into such aspects of general practice as the referral system, increases. As a result, better day-to-day administrative decisions and planning initiatives will lead to a health care system better suited to the needs of its clients, the patients.

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Appendix

Analysis of disease characteristics of referred patients

More detailed medical information about the referral process in these two specialties can be found by tabulating the ICD categories of illness against the 'reasons for referral'.

Key to ICD Disease Categories:

Number	Disease
2	All malignant neoplasms
10	Diseases of the ear and mastoid processes
12	Diseases of the peripheral circulatory system
13	Diseases of the respiratory system
14	Diseases of the digestive system
15	Diseases of the urinary system
16	Male genital disorders
17	Diseases of the breast and female genital system
19	Diseases of the skin and subcutaneous tissue
21	Congenital anomalies
23	Symptoms and ill-defined conditions
26	Persons without current complaint or sickness

TABLE 13: Classification of disease categories by medical reasons for referral.

Average SEVERITY value (percentage of total referrals) : 57.8%
Conditions with above average SEVERITY value : 2, 10, 13, 14, 16, 21, 23
Conditions with below average SEVERITY value : 12, 15, 17, 19, 26

Average DETERIORATION value : 30.7%
Above average DETERIORATION values : 2, 10, 12, 13, 15, 23
Below average DETERIORATION values : 14, 16, 17, 19, 21, 26

Average FAILURE value : 28.1%
Above average FAILURE value : 2, 13, 14, 15, 23
Below average FAILURE value : 10, 12, 16, 17, 19, 21, 26

Above average values for all 3 values : 2, 13, 23
Below average values for all 3 values : 17, 19, 26
Conditions with more complex factor occurance : 10, 12, 14, 15, 16, 21.

It is possible to interpret above average incidence for all three factors as being conditions which are most commonly treated in general practice, and which are referred only when they get beyond the control of the GP. Those diseases which fall consistently below the factor averages suggest themselves as non-severe but highly monitored conditions in which the referral decision is relatively straight-forward. For those diseases falling in the third category (a mixture of levels of factor occurrence) an interpretation is not immediately clear.

Response rates

	No.	%	Practice size (GPs) 1	2	>2
Completed returns	27	37	4 40%	2 12%	21 44%
Promised but not returned	24	33	3 30%	9 47%	12 25%
Refusal	22	30	3 30%	4 25%	15 31%

List sizes of participants

1500-1999	2000-2499	2500-2999	3000+
5 19%	6 23%	10 38%	5 19%

Number of years in general practice

0-9	10-19	20-29	30-39	40+
13	2	2	4	2

N.B. 3 non-respondents

TABLE 1

	frequency	% of total	% of total recordings of factors		
			Severity	Deterioration	Failure
Severity	70	34.1%	58.3%		
Deterioration	17	8.3%		27.4%	
Failure	14	6.8%			24.5%
Severity and deterioration	16	7.8%	13.3%	25.8%	
Severity and failure	14	6.8%	11.7%		24.6%
Deterioration and failure	9	4.4%		14.5%	15.8%
Severity, deterioration and failure	20	9.8%	16.7%	32.2%	35.1%
			100.0%	99.9%	100.0%

Total recordings:	Frequency
Severity	120
Deterioration	62
Failure	57

TABLE 2 : Frequency of occurance of reasons for referral

Age	0-4	5-14	15-34	35-64	Over 64
Percentage of total population	8.4%	11.7%	29.8%	36.0%	14.1%
Referral rates/1000 population/year	85	132	95	100	110

(source: H.A.A., Yorkshire Regional Health Authority, 1983)

TABLE 3 : Age distribution for total population of DHA and annual referral rates (out-patient and in-patient) to ENT and General Surgery

Total recordings	Frequency	% age of total referred (173)
Choice in referral	123	71.1%
Opinion of consultant	91	52.0%
Convenience of clinic for patient	54	30.9%
Waiting list length	48	27.4%
Patient request	43	24.6%
Opinion of hospital	38	21.7%
Emergency	33	18.9%
Ease of admission	27	15.4%

TABLE 4 : Service factors in referral

q = 64 (choice, opinion of consultant)

q = 45 (choice, waiting list, opinion of consultant)

q = 42 (choice, waiting list, convenience, opinion of consultant)

q = 36 (choice, waiting list, convenience, opinion of consultant, opinion of hospital)

q = 29 (emergency, choice, waiting list, convenience, opinion of consultant, opinion of hospital)

q = 28 (emergency, choice, request, waiting list, convenience, opinion of consultant, opinion of hospital)

q = 23 (emergency, choice, request, waiting list, convenience, opinion of consultant, opinion of hospital, ease of admission)

TABLE 5 : Connectivity values (q-listings) for patient and health service factors (summary of connectivity matrix)

Key: Value Referral decision type (Y axis)

Value	Referral decision type (Y axis)
1	Not considered an alternative
2	Considered an alternative
3	Patient sent to consultant
4	Patient sent privately

CONSULTANT A

Count Col Pct	0-5	6-18	19-35	36-65	Over 65	Row total
1	0 0.0	1 9.1	2 5.3	5 11.1	1 4.8	9
2	2 25.0	1 9.1	11 28.9	11 24.4	2 9.5	27
3	3 37.5	2 18.2	14 36.8	16 35.6	9 42.9	44
4	0 0.0	2 18.2	3 7.9	2 4.4	1 4.8	8

TABLE 6 : Crosstabulations of patient age by GP's referral preference to General Surgery Consultant

CONSULTANT B

Count Col Pct	0-5	6-18	19-35	36-65	Over 65	Row total
1	0 0.0	0 0.0	3 7.9	4 8.9	2 9.5	9
2	1 12.5	0 0.0	5 13.2	8 17.8	4 19.0	18
3	5 62.5	6 54.5	18 47.4	18 40.0	9 42.9	56
4	0 0.0	2 18.2	3 7.9	2 4.4	1 4.8	8

TABLE 7 : Crosstabulations of patient age by GP's referral preference to General Surgery Consultant

	Waiting list	Convenience	Request	Opinion of consultant
Consultant A	8.9%	24.4%	36.0%	51.1%
Consultant B	33.3%	35.1%	8.8%	63.2%

TABLE 8 : Percentage of patients received by Consultants A and B whose referral was affected by given health service factor

Configuration of factors in referral	Consultant A	Consultant B
Waiting list Opinion of C 1.0	20	24
Waiting list 1.0 Opinion of C 1.0	3	12
Waiting list 1.0 Opinion of C	1	7

TABLE 9 : Occurrence of the factors 'waiting list' and 'opinion of consultant' for consultants A and B

CONSULTANT C

Count Col Pct	0-5	6-18	19-35	36-65	Over 65	Row total
1	0 0.0	1 6.7	0 0.0	0 0.0	1 16.7	2
2	1 25.0	1 6.7	1 10.0	6 37.5	1 16.7	10
3	0 0.0	9 60.0	4 40.0	2 12.5	2 33.3	17
4	0 0.0	0 0.0	1 10.0	0 0.0	0 0.0	1

TABLE 10 : Crosstabulations of referral preference for ENT consultants by the age of the patients

CONSULTANT D

Count Col Pct	0.5	6.18	19.35	36.65	Over 65	Row total
1	0 0.0	2 13.3	0 0.0	3 18.8	1 16.7	6
2	0 0.0	0 0.0	2 20.0	1 6.3	0 0.0	3
3	4 100.0	5 33.3	5 50.0	9 56.3	2 33.3	25
4	0 0.0	0 0.0	1 10.0	0 0.0	0 0.0	1

TABLE 11 : Crosstabulations of referral preference for ENT consultants by the age of the patients

	Waiting list	Convenience	Patient request	Opinion of consultant
Consultant C	11.8%	47.1%	35.3%	64.7%
Consultant D	80.0%	48.0%	20.0%	36.0%

TABLE 12 : Percentage of patients received by Consultants C and D whose referral was affected by the given health service factor

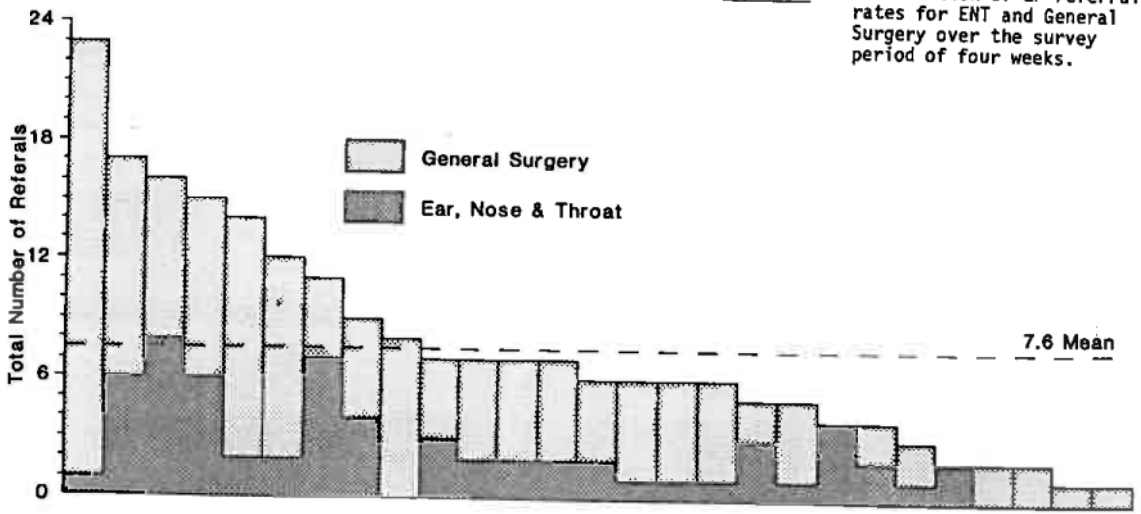


FIGURE 1 : Distribution of GP referral rates for ENT and General Surgery over the survey period of four weeks.

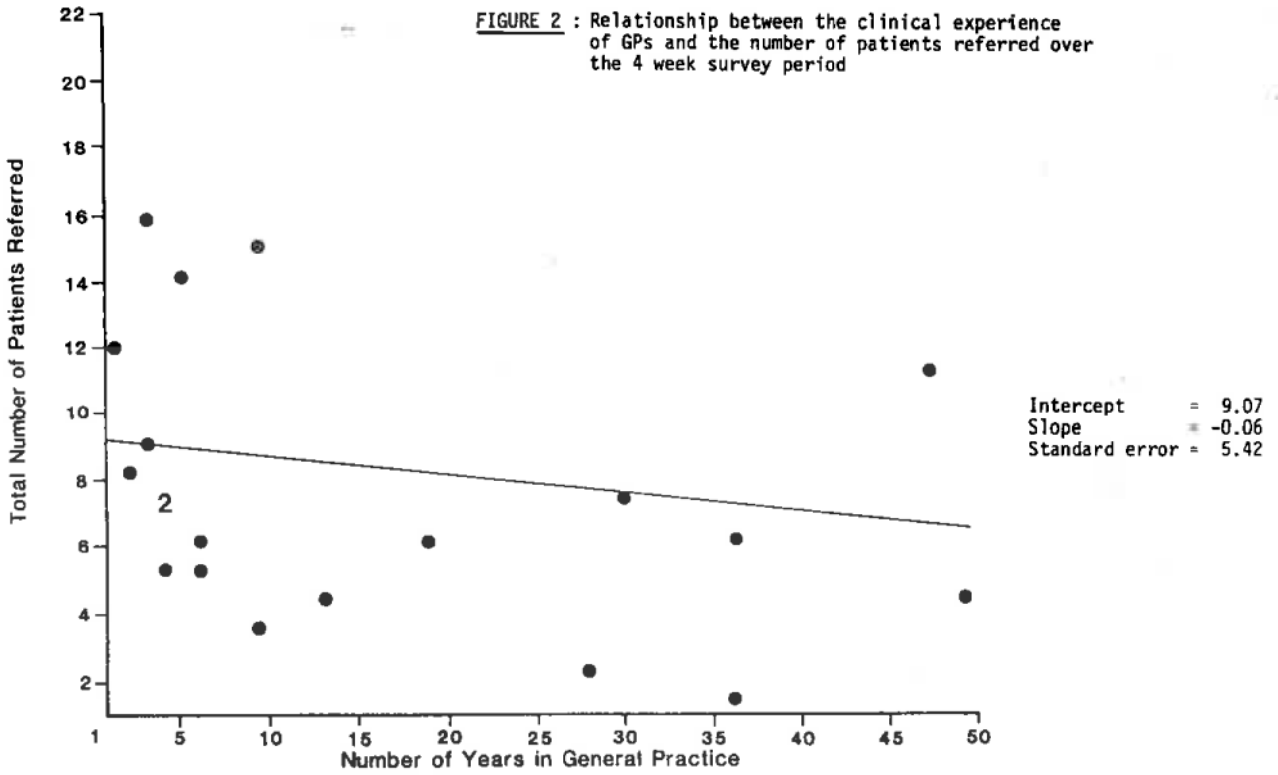


FIGURE 2 : Relationship between the clinical experience of GPs and the number of patients referred over the 4 week survey period

FIGURE 3 :
Relationship between the age of the practice and the number of patients referred over the 4 week period

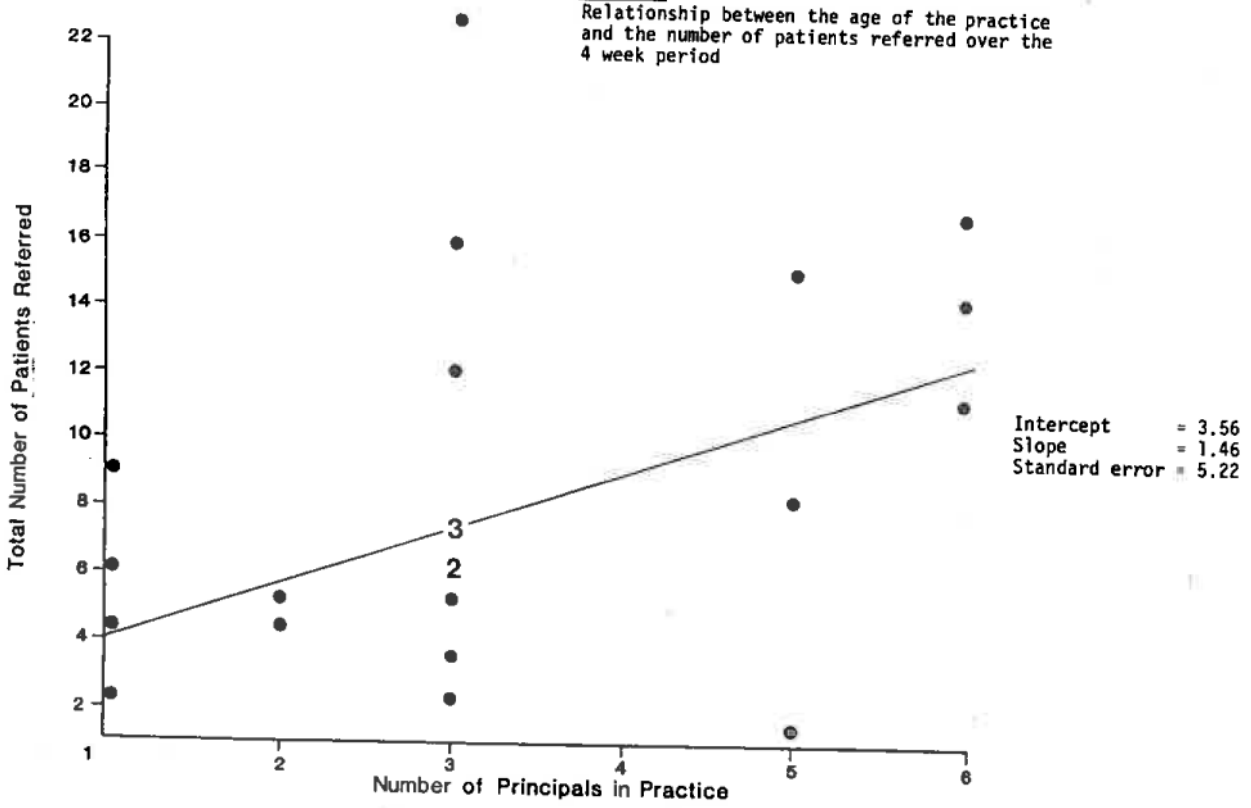


FIGURE 4 : "SEVERITY" AS A FACTOR IN REFERRAL FOR FIVE PATIENT AGE GROUPS

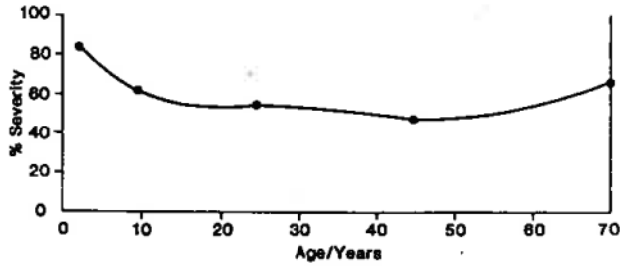


FIGURE 5 : "DETRIORATION" AS A FACTOR IN REFERRAL BY AGE OF PATIENT

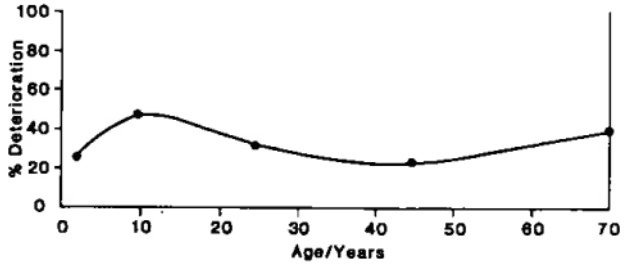


FIGURE 6 : "FAILURE OF TREATMENT" AS A FACTOR IN REFERRAL BY AGE OF PATIENT

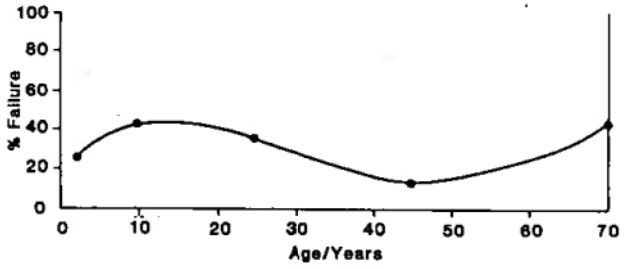
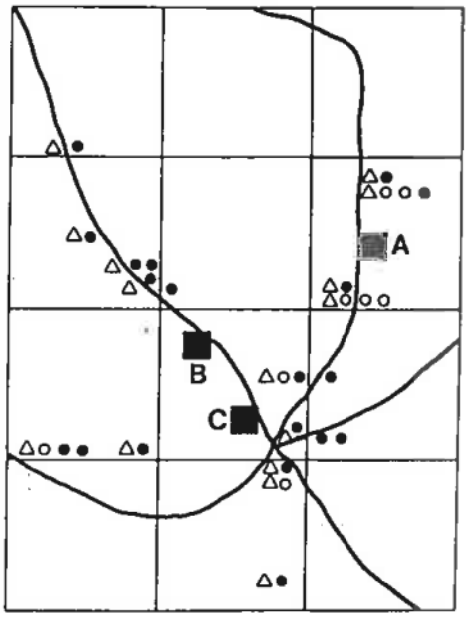


FIGURE 7 : Map of surveyed district showing location of participating GPs relative to general hospitals A, B and C, and showing the importance of the factor 'convenience' to their referral decisions.



● 'CONVENIENCE' LISTED IN 49% OR LESS OF G.P.'s REFERRALS
o 'CONVENIENCE' LISTED IN 50% OR MORE OF G.P.'s REFERRALS
△ GENERAL PRACTICE