# PRACTICE OBSERVED

## *Practice Research*

# Area variations in the process of care in urban general practice

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**Abstract**

**One hundred and eighty three practitioners collected data on 110 000 consultations. Case mix and pattern of care are compared for doctors practising in different urban areas. Inner city areas are compared with outer areas and the most deprived with the most affluent. Case mix varies slightly between areas, but there are no systematic differences in the pattern of care, which is equally variable in different areas. The stereotype of inner city general practice is not confirmed.**

### Introduction

The increasing emphasis on care in the community places heavy responsibilities on the primary health care team and on general practitioners in particular. Yet there are doubts about the ability or willingness of general practitioners to meet these responsibilities in all areas. In particular, general practice in the inner cities has been impugned as unable to meet the needs of the populations of these areas, who suffer economic and social disadvantage as well as increased mortality and morbidity.[1]

Work in London has shown an association between certain features of practice structure—such as manpower, training, equipment, premises, and staff—and patterns of morbidity and mortality.[2 3] Such work suggests that having an area strategy for improving general practice would identify areas of both great need and poor standards of care. Two important questions remain unanswered, however. Firstly, what is the relation between the structural characteristics of practice and the actual care provided? Secondly, is the situation described in London representative of the other major cities in the United Kingdom?

Wood described a large survey of general practitioners conducted by the Primary Care Research Unit in Manchester, the results of which showed that in contrast to London there were few differences between the inner city and outer areas of Manchester in the structural characteristics of general practice.[4 5] She warned, however, that "similarities in the way services are organised may conceal important differences in access to service and the treatment provided." Indeed, it is sometimes suggested that although doctors can to a large extent determine the structural characteristics of their practices, the pattern of care that they provide is largely controlled by levels of demand, the types of cases, and the behaviour of the people for whom they provide care, which reflect the socioeconomic characteristics of their patient populations.

The research unit then undertook a study of the process of care to show whether there were systematic differences in the pattern of care provided in different parts of the city of Manchester. (A study of the "process" of care in urban general practice. Report to the DHSS, 1983, unpublished.)

This paper reports the findings of that study in terms of both a simple distinction between inner and outer areas and a more complex classification of different types of neighbourhood.

### Methods

The population for the first study reported by Wood was made up of general practitioner principals practising in Manchester, Salford, and Trafford. Of the 485 general practitioners, 366 (75%) agreed to be interviewed. These general practitioners were then asked if each of three four-month periods, yielding a total of 80 267 consultations.

Two methods are used to describe the areas in which the general practitioners had their main surgery. The first is the inner city partnership area, as defined by the Department of the Environment, compared with all other areas of the city. The second is a more complex classification of five types of areas derived from a cluster analysis of wards conducted by the Greater Manchester County Planning Department, using a classification package developed by Openshaw and applied to data from the 1981 census.[6] The five types of areas are crudely characterised in table III, and fig 2 shows their location. The most deprived areas of the city are not exclusively concentrated in the inner area. Although there is some geographical grouping of wards, this does not produce a series of concentric rings around the centre.

In presenting the analyses we used the $\chi^2$ statistic to measure the statistical significance of observed associations between area and process of care. This is intended only to permit generalisation to the population of consultations from which the sample was drawn—that is, all consultations for this group of general practitioners. Nevertheless, we showed above that this group was representative of all general practitioners in the study area. Where the analyses are derived from age weighted samples, the $\chi^2$ statistic is based on expected frequencies generated separately for each age group, as suggested by Armitage.[7]

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TABLE III—*Summary characteristics of ward clusters*

A High concentration of poverty. High unemployment (25%). Low social class. Mostly modern council housing. Mixture of low and high rise housing.
B Older housing often in bad condition. Mixture of owner occupied, privately rented, and council rented. Unemployment 18%. Low social class.
C Broader social class mix than A or B. Slightly more affluent. Mixed housing but better than B. More multioccupied housing. Unemployment 18%.
D Average for the conurbation. Few extremes. Relatively good housing. Mixture of owner occupied and established council rented. Unemployment 11%. Mostly social class III.
E Most affluent areas. Good quality owner occupied housing. Low unemployment (7%). High social class.

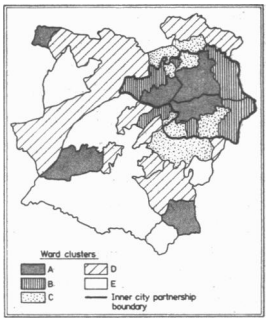


FIG 2—Map of study area of Manchester, Salford, and Trafford

TABLE IV—*Age of patients consulting in inner city and outer area*

| Age group | Percentage of patients in inner area (n = 32 494) | Percentage of patients in outer area (n = 42 508) | Total* (n = 74 990) |
|---|---|---|---|
| 0–4 | 9·3 | 8·7 | 9·0 |
| 5–14 | 7·8 | 8·1 | 8·0 |
| 15–34 | 29·0 | 28·5 | 28·8 |
| 35–54 | 22·6 | 21·8 | 22·1 |
| 55–64 | 13·1 | 13·0 | 13·0 |
| 65–74 | 11·0 | 11·3 | 11·2 |
| 75 and over | 7·1 | 8·6 | 8·0 |

$\chi^2 = 69\cdot55$, $p = <0\cdot01$
Cramer's V = 0·03

TABLE V—*Types of cases in inner city compared with those in outer area (Percentages of age weighted samples)*

| Cases categorised by International Classification of Diseases | Inner area | Outer area | Total |
|---|---|---|---|
| (1) Infectious/parasitic | 6·8 | 7·9 | 7·3 |
| (2) Neoplasms | 1·3 | 1·4 | 1·3 |
| (3) Endocrine/nutritional/metabolic | 2·7 | 2·0 | 2·4 |
| (5) Mental | 8·1 | 7·3 | 7·7 |
| (6) Central nervous system | 6·6 | 7·1 | 6·9 |
| (7) Circulatory system | 10·4 | 10·4 | 10·4 |
| (8) Respiratory system | 19·4 | 17·4 | 18·4 |
| (9) Digestive system | 5·3 | 4·7 | 5·0 |
| (10) Genitourinary | 4·2 | 4·6 | 4·4 |
| (12) Skin | 5·3 | 5·4 | 5·4 |
| (13) Musculoskeletal | 8·4 | 8·6 | 8·5 |
| (16) Symptoms | 3·2 | 2·9 | 2·8 |
| (17) Accidents | 5·2 | 5·6 | 5·4 |
| (18) Supplementary | 12·0 | 13·7 | 12·9 |

$\chi^2 = 237\cdot52$, $p = <0\cdot01$
Cramer's V = 0·56

ally significant, the value of Cramer's V, which measures the strength of association (range 0–1), is very low, reflecting the small scale of differences between areas. A similar pattern is evident with respect to general practitioner actions. Table VI shows the percentage of consultations in which selected events occurred. Some of the differences between inner and outer areas are statistically significant, but the associations are extremely weak. Differences in consultant referrals and referrals to district nurses were statistically significant but virtually negligible in scale. The largest differences were in the percentage of consultations occurring in the patient's own home and the proportion receiving a prescription, although the values of Cramer's V were still below 0·05.

TABLE VI—*Actions taken by general practitioners in inner city and outer area (Percentages of age weighted samples)*

| Action | Inner area | Outer area | Total | $\chi^2$ | p | Cramer's V |
|---|---|---|---|---|---|---|
| Home visit | 9·6 | 12·3 | 9·9 | 143·07 | <0·01 | 0·042 |
| Prescription | 73·9 | 70·3 | 72·1 | 128·99 | <0·01 | 0·042 |
| Laboratory test | 4·0 | 4·0 | 4·0 | 0·0165 | 0·90 | 0·0005 |
| X ray examination | 1·8 | 1·7 | 1·7 | 0·967 | 0·40 | 0·003 |
| Consultant referral | 5·9 | 6·3 | 6·1 | 3·505 | 0·06 | 0·007 |
| Social services referral | 0·3 | 0·2 | 0·2 | 32·805 | 0·11 | 0·006 |
| Nursing referral | 0·8 | 0·6 | 0·7 | 10·317 | 0·01 | 0·001 |
| Return appointment fixed | 38·7 | 38·6 | 38·7 | 0·361 | 0·55 | 0·002 |

### Results

#### INNER CITY AND OUTER AREAS

Doctors who practise in the outer area of the city saw a somewhat higher proportion of patients in the age group 75 and over compared with doctors in the inner area (table IV). Because of the supposed impact of the age distribution of patients on the types of cases and pattern of care subsequent analyses were based on weighted samples that standardise the age distribution in the two areas.

As might be expected, consultations for mental and respiratory problems constituted a higher proportion of the total in the inner city area than in the outer area (table V). Although the $\chi^2$ value is statistic-

#### NEIGHBOURHOOD TYPES

Table VII shows the age distribution of patients consulting general practitioners in the five area types identified. The highest proportions of very young children were found in the most deprived



they would collect data on all doctor-patient contacts for one day at a time on 20 selected days spread over one year: 208 (57%) doctors agreed to take part and 183 (50%) completed the collection of data. This represents 40% of all general practitioners in the study area. In terms of all characteristics for which information was available—for example, age, sex, number of patients on list, and number of partners—the doctors who participated were remarkably representative of all general practitioners in the study area (table I).

TABLE I—*Representativeness of general practitioners participating in study*

| Characteristics of doctors and practices | Percentage of all general practitioners in study area (n = 485) | Percentage of participating general practitioners (n = 183) |
|---|---|---|
| *Sex* | | |
| Male | 80 | 85 |
| Female | 20 | 15 |
| *Age (years)* | | |
| <30 | 3 | 4 |
| 30–39 | 24 | 28 |
| 40–49 | 29 | 33 |
| 50–59 | 29 | 26 |
| 60 and over | 15 | 9 |
| *Country of origin* | | |
| United Kingdom and Eire | 72 | 72 |
| Other | 28 | 28 |
| *Size of partnership* | | |
| One | 21 | 21 |
| Two | 20 | 17 |
| Three or four | 47 | 45 |
| Five or more | 12 | 16 |
| *Number of patients on list* | | |
| <1000 | 3 | 1 |
| 1000–1499 | 9 | 7 |
| 1500–1999 | 31 | 29 |
| 2000–2499 | 30 | 36 |
| 2500–2999 | 22 | 25 |
| 3000 or more | 6 | 12 |

On "recording days" each general practitioner was asked to complete one line of the encounter form (fig 1) for every face to face contact with a patient, whether in the surgery or at home. A new line was completed for each problem having an attributable course of action. The choice of which elements to record was largely determined by what was considered possible within the constraints of a busy surgery. All coding, including social class, presenting problem, and diagnosis, was undertaken by the research team. Though this method of collecting data proved to be widely acceptable and practicable, it had two important limitations. Firstly, it permitted recording of only a few relatively clear cut "events," thus excluding reference to such things as the thoroughness of examination or the quality of the interaction between doctor and patient. Secondly, because few of the participating doctors had accurate age-sex registers data derived from consultations could not be related to the registered population in terms of groups of a given age, sex, or social class.

TABLE II—*Reliability of data recorded by general practitioners compared with that recorded by independent interviewers*

| | % Agreement | Kappa coefficient* |
|---|---|---|
| Sex | 99 | 0·974 |
| Age | 96 | 0·967 |
| Social class | 81 | 0·831 |
| New-old patients | 81 | 0·665 |
| Presenting problems | 60 | 0·607 |
| Prescription | 97 | 0·921 |
| Certificate | 98 | 0·860 |
| Laboratory test | 97 | 0·796 |
| X ray examination | 99 | 0·702 |
| Referral | 97 | 0·830 |
| Return appointment fixed | 87 | 0·733 |

*Kappa is a measure of the strength of agreement after making allowance for agreement that might have occurred by chance.[8] Kappa ranges between −1 and +1. A value of 0 would imply chance agreement only, −1 complete disagreement, and +1 complete agreement.

The reliability of the encounter form was tested for all items except diagnosis by comparing information recorded by general practitioners with that obtained by independent interviewers for a sample of 500 consultations. Table II shows a high level of agreement between interviewers and general practitioners, except for presenting problems. In addition to this exercise, regular routine checks of coding procedures were conducted.

Between June 1981 and December 1982 the 183 general practitioners collected information on approximately 110 000 consultations. Factors such as illness, holidays, and practice problems, however, caused some "slippage" in the recording schedule, which produced an overlap of recording days and a resulting overrepresentation during the autumn. The potential biases introduced by these factors were removed by creating a "structured data base." This consisted of the days of three working weeks for each general practitioner, one week in

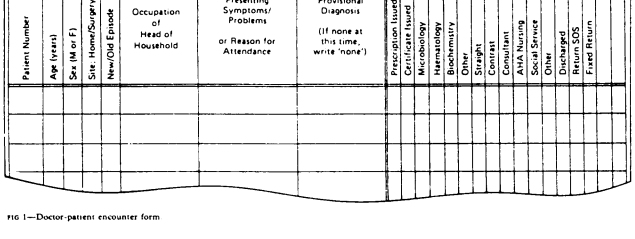


FIG 1—Doctor-patient encounter form



areas and the highest proportions of elderly people in the more affluent areas. Although differences were not large, subsequent analyses were based on age weighted samples, as for the comparisons of inner city and outer areas.

TABLE VII—*Age of patients consulting by ward clusters*

| Age group | Ward clusters (%): A (n = 19 107) | B (n = 10 757) | C (n = 12 310) | D (n = 17 882) | E (n = 14 934) | Total (n = 74 990) |
|---|---|---|---|---|---|---|
| 0–4 | 9·4 | 9·2 | 9·3 | 8·4 | 8·6 | 9·0 |
| 5–14 | 7·9 | 7·9 | 7·4 | 8·2 | 8·4 | 8·0 |
| 15–34 | 30·6 | 28·2 | 30·2 | 27·3 | 27·3 | 28·8 |
| 35–54 | 22·5 | 22·3 | 22·2 | 21·1 | 22·7 | 22·1 |
| 55–64 | 13·2 | 13·3 | 12·0 | 13·3 | 13·1 | 13·0 |
| 65–74 | 9·7 | 12·2 | 11·9 | 12·3 | 11·0 | 11·2 |
| 75 and over | 6·7 | 7·0 | 7·4 | 9·5 | 8·9 | 8·0 |

$\chi^2 = 300\cdot62$, $p = <0\cdot01$
Cramer's V = 0·032

Table VIII shows small overall differences in the types of cases among areas and no consistent pattern between the most and the least deprived areas. Similarly, there were few differences and no systematic pattern in actions that general practitioners took (table IX). Prescribing was somewhat less common in the most affluent areas but laboratory tests, x ray examinations, and all types of referral were most common in cluster C.

TABLE VIII—*Types of cases by ward clusters (Percentages of age weighted samples)*

| Cases categorised by International Classification of Disease | Ward clusters: A | B | C | D | E | Total |
|---|---|---|---|---|---|---|
| (1) Infectious/parasitic | 7·5 | 6·4 | 8·2 | 8·1 | 7·9 | 7·6 |
| (2) Neoplasms | 1·3 | 1·3 | 1·2 | 1·4 | 1·2 | 1·3 |
| (3) Endocrine/nutritional/metabolic | 2·8 | 2·3 | 2·1 | 1·9 | 2·1 | 2·2 |
| (5) Mental | 8·7 | 6·8 | 7·5 | 7·0 | 7·6 | 7·5 |
| (6) Central nervous system | 6·4 | 6·4 | 6·8 | 7·1 | 7·7 | 6·9 |
| (7) Circulatory system | 9·2 | 10·4 | 9·4 | 10·5 | 9·7 | 9·6 |
| (8) Respiratory system | 18·2 | 21·0 | 19·1 | 18·6 | 16·7 | 18·6 |
| (9) Digestive system | 5·1 | 5·0 | 5·0 | 4·6 | 4·7 | 4·9 |
| (10) Genitourinary | 4·4 | 4·0 | 4·4 | 4·7 | 5·2 | 4·5 |
| (12) Skin | 5·5 | 5·4 | 5·5 | 5·4 | 5·5 | 5·5 |
| (13) Musculoskeletal | 7·9 | 7·4 | 9·2 | 8·5 | 8·3 | 8·3 |
| (16) Symptoms | 3·4 | 2·6 | 2·9 | 2·5 | 2·4 | 2·8 |
| (17) Accidents | 5·3 | 5·5 | 5·3 | 5·7 | 5·5 | 5·5 |
| (18) Supplementary | 12·8 | 14·1 | 12·7 | 13·8 | 14·3 | 13·5 |

$\chi^2 = 524\cdot6$, $p = <0\cdot01$
Cramer's V = 0·0383

### Discussion

The data presented here provide sufficient cause to at least reconsider accepted stereotypes of general medical practice in deprived urban areas. Wood's warning that similarities in structure may conceal important differences in the care provided seems to have been unnecessary. The similarity of practice structure in inner city and outer areas seems to be mirrored by the similarity in the pattern of care provided. Patients who attend general practitioners in the inner city present much the same types of problems as those in other areas and receive similar patterns of care in terms of prescriptions, investigations, and referrals.

It may be argued, however, that the crude administrative boundary used by the Department of the Environment to identify areas of need is insufficiently sensitive since areas of deprivation are not entirely concentrated around the city centre. We have therefore grouped general practitioners according to the location of their practice premises with respect to five area clusters ranging from most deprived to most affluent. As for comparing inner and outer areas, there was no systematic relation between indices of social and economic deprivation and the pattern of care provided by general practitioners. Our measures of the process of care do not show less active care in the more deprived areas, but neither do they show more active care in such areas, where it might be considered appropriate in view of higher levels of need.

It seems that each area of the city has general practitioners who provide a variety of patterns of care. Differences between neighbourhoods far outweigh differences within neighbourhoods. Variations in the pattern of care provided by general practitioners are more likely to reflect the characteristics of the doctor than those of the area or patient. At least in Manchester, and probably in other provincial cities of the United Kingdom, the stereotype of the inner city doctor seems to have little foundation in reality. If so, then approaches to tackling problems in general practice based on areas might result in a misdirection of resources, despite their convenience to politicians and administrators. There are, of course, good grounds for using an area strategy to tackle health problems that are concentrated among particular social groups and in particular areas.

The results of our study cannot throw any light on levels of need in different areas, or on variations in accessibility and acceptability, but it does show that all areas contain a similar range of different styles of care. This is discouraging for those who wish to identify target areas, since there are many practices in such areas that do not need improving and many outside that do. This, however, is good news for young doctors who are considering entering practice in the inner city, because it seems to be just as possible to practise "good medicine" there as in the more affluent suburbs.

### References

1 Anonymous. Primary care in inner London: inadequate and exposed. [Editorial] *Br Med J* 1981;**282**:1739–40.
2 Jarman BA. *A survey of primary care in London*. Occasional paper 16. London: Royal College of General Practitioners, 1981.
3 Acheson ED. *Primary health care in inner London*. London: Health Planning Consortium, 1981.
4 Wood J. Are the problems of primary care in inner cities fact or fiction? *Br Med J* 1983;**286**:1109–12.
5 Wood J. Are general practitioners in inner Manchester worse off than those in adjacent areas? *Br Med J* 1983;**286**:1249–52.
6 Cohen J. A coefficient of agreement for nominal scales. *Educational and Psychological Measurement* 1960;**20**:37–46.
7 Armitage P. *Statistical methods in medical research*. London: Blackwell, 1971: 273–5.

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TABLE IX—*Actions taken by general practitioners by ward clusters (Percentages of age weighted samples)*

| Action | Ward clusters: A | B | C | D | E | Total | $\chi^2$ | p | Cramer's V |
|---|---|---|---|---|---|---|---|---|---|
| Home visits | 10·4 | 7·4 | 8·8 | 12·8 | 9·8 | 9·9 | 262·55 | <0·01 | 0·054 |
| Prescription | 72·3 | 73·5 | 72·6 | 71·4 | 68·4 | 71·6 | 395·34 | <0·01 | 0·067 |
| Laboratory test | 3·6 | 3·1 | 5·2 | 3·3 | 5·0 | 4·0 | 153·51 | <0·01 | 0·042 |
| X ray examination | 1·3 | 1·6 | 2·6 | 1·7 | 1·7 | 1·8 | 88·57 | <0·01 | 0·032 |
| Consultant referral | 5·3 | 5·6 | 7·1 | 7·0 | 5·8 | 6·1 | 75·23 | <0·01 | 0·029 |
| Social services referral | 0·2 | 0·2 | 0·3 | 0·2 | 0·2 | 0·2 | 12·25 | <0·01 | 0·012 |
| Nursing referral | 0·6 | 0·4 | 0·9 | 0·8 | 0·5 | 0·6 | 13·47 | <0·01 | 0·012 |
| Return appointment fixed | 36·7 | 41·1 | 34·4 | 38·1 | 40·9 | 38·2 | 262·96 | <0·01 | 0·054 |