

# Spatial patterns of surgery attendance: some implications for the provision of primary health care

D. R. PHILLIPS, B.SC.ECON, PH.D

Lecturer, Department of Geography, University of Exeter

**SUMMARY.** The results from a survey of the use of general practitioner services are discussed to illustrate variations in patterns of surgery attendance. These patterns were partly influenced by factors such as social status and personal mobility of respondents. Age of respondents did not cause much differentiation of patterns but respondents were often found to be maintaining contact with practices in areas in which they previously lived, even where this involved travelling considerable distances. The implications of these findings are considered, given current tendencies to centralize primary care services, particularly into neighbourhood health centres.

### Introduction

**R**ECENTLY, considerable attention has been focused on general levels of accessibility to various personal social service facilities in different urban areas. This interest reflects widespread academic and administrative concern with matters of spatial equality in service provision and, where services are not equally available to all, with whether this can be justified in terms of 'equity' or 'fairness'. Do some areas, in greater need of a certain type of service, actually receive the amount of attention that natural justice demands they should?

Some geographers have addressed this concept in broad terms, seeking to find out whether particular areas of the city have greater or lesser accessibility to services and, if so, whether this can be related to the social characteristics of their residents (Knox, 1979; Smith, 1979). This type of research can help to reveal spatial imbalances in the location of general practices, and can help to identify specific neighbourhoods which are, in aggregate terms, less well provided with services.

More interesting, and in many ways more important, is the question of the location of general medical practices. In the past, this has been investigated by

research which has shown that practices often draw their patients from wide 'catchment areas' (Vaughan, 1967; Richardson and Dingwall-Fordyce, 1968), although a redefinition of catchment areas is increasingly being encouraged by family practitioner committees in Britain.

Research which focuses on the distribution of patients from specific practices is useful, especially from the point of view of practitioners who may have to travel unnecessarily to distant homes, even though more distant patients do not generally place greater demands on the family doctor (Hopkins *et al.*, 1968). It has also been reported that increasing distance can reduce consultation and attendance rates (Parkin, 1979).

However, research of this type portrays only one aspect of the picture, as patients who live within the immediate vicinity or catchment area of individual practices but who do not attend them are 'lost' to analysis. This is analogous to consumer research which concentrates only upon customers who patronize specific centres and thus does not include non-attenders in its analysis. The obverse and complement to this approach have been developed in empirical geographical research into consumer behaviour. In this, respondents in specific residential areas are interviewed in their homes in order to find out their pattern of usage of services.

This approach may be applied to investigate surgery attendance patterns in general practice. If significant numbers of respondents in specific residential areas appear to be going outside their immediate neighbourhoods for general medical services, then this is an important finding. The trend towards the provision of local facilities from large practice premises or health centres has been well documented. Allied to this trend is the growth of group practices and, in particular in recent years, of large group practices of four, five, six, or more general practitioners (Office of Health Economics, 1974; Royal College of General Practitioners, 1977; Phillips, 1980).

Thus, although a decrease in absolute numbers of family doctors does not necessarily occur, there is

inevitably a reduction in the number of separate practices available for use by the public. Group practice, and particularly the development of large groups of general practitioners, inevitably means fewer main surgeries are in use (even if some branch surgeries are maintained). In West Glamorgan, for example, there were only about one half the number of main surgeries in use in 1977 as there had been in 1960 (Phillips, 1980). Therefore, in the face of these developments, empirical knowledge about attendance patterns is essential if future services are to be provided in an equitable and effective manner.

Very little is known about the way in which patients select and maintain contact with a surgery (although, in some instances, little real choice of surgery may be available). Nevertheless, when planning facilities those involved generally work on the assumption that they will be used by a majority of local residents. This thinking has become particularly enshrined in the planning mind, resulting in the provision of wide ranging facilities in 'neighbourhood centres'. This tendency is not new by any means, and has existed since the 'Radburn' planning of neighbourhood units in the 1920s.

A well established geographical theory—central place theory—suggests that, for goods or services of the 'convenience' type, the nearest centre offering them will be attended. However, many social and economic factors can interfere with this choice of nearest centre as will be subsequently shown. Low (1975) has coined the word 'centrism' for the ideology underlying the notion that facilities should best be provided in centres, and it seems very much the case that this notion is being implicitly and explicitly adopted in the planning of primary health care. This policy is being pursued in spite of there being remarkably little empirical information about existing surgery attendance patterns which, in view of the current interest in consumer opinion in health services, seems surprising.

### Aim

The aim of this paper is to present some empirical data about the patterns of surgery attendance found during a research project concerned with public use of, and attitudes to, general practitioner services in West Glamorgan.

### Method

The methodology referred to above was adopted, namely, interviewing respondents in carefully chosen neighbourhoods. Considerable care must be taken in the selection of neighbourhoods for such social surveys because of the great variability in sociodemographic structures and service availability that exists in different parts of urban areas, which can complicate the interpretation of research findings.

For this reason, a geographical research method

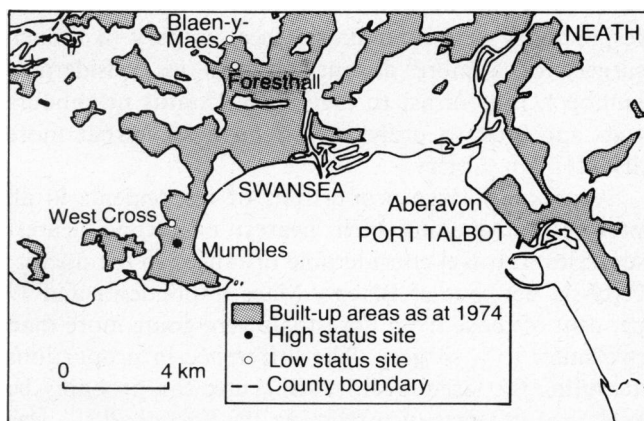
known as 'areal sampling' was employed. This enabled the selection of pairs of enumeration districts which were near to each other (therefore having access to the same broad range of local general practice surgeries). However, some prior knowledge of the social composition of the selected enumeration districts could be ascertained by reference to census data which gave an indication of the age structures, social characteristics, and housing and household types prevailing in each district. Thus, enumeration districts which differed only with respect to specific, required variables could be selected.

I also investigated whether the patterns of surgery attendance were influenced by specific respondent variables, including proximity, since the literature suggests that social class, age and personal mobility can influence service attendance patterns. During the course of interviewing, "place of previous residence" also emerged as an important variable underlying the patterns of behaviour.

About 50 households were visited in four pairs of enumeration districts, giving a total of 400 respondents. The results from two pairs of sites are now discussed briefly to illustrate the importance of social class, accessibility, and previous residence in influencing attendance patterns. The pairs of sites were both situated within the Greater Swansea Area (1971 population approximately 375,000).

One of the pairs, West Cross (Figure 1), had two enumeration districts adjacent to each other, both having the same range of surgery facilities available but with respondents of differing social status (the sites were therefore broadly designated as low status and high status). The other pair of sites, Blaen-y-Maes and Foresthall, were both low social status residential areas but were selected as they lay at different distances from their nearest surgery facilities. Blaen-y-Maes was about one and a quarter miles away from a main health centre (housing approximately 10 general practitioners), whilst Foresthall was less than a quarter of a mile from this centre. It is therefore well within the suggested maximum acceptable walking distance to neighbourhood

Figure 1. The location of the survey sites.



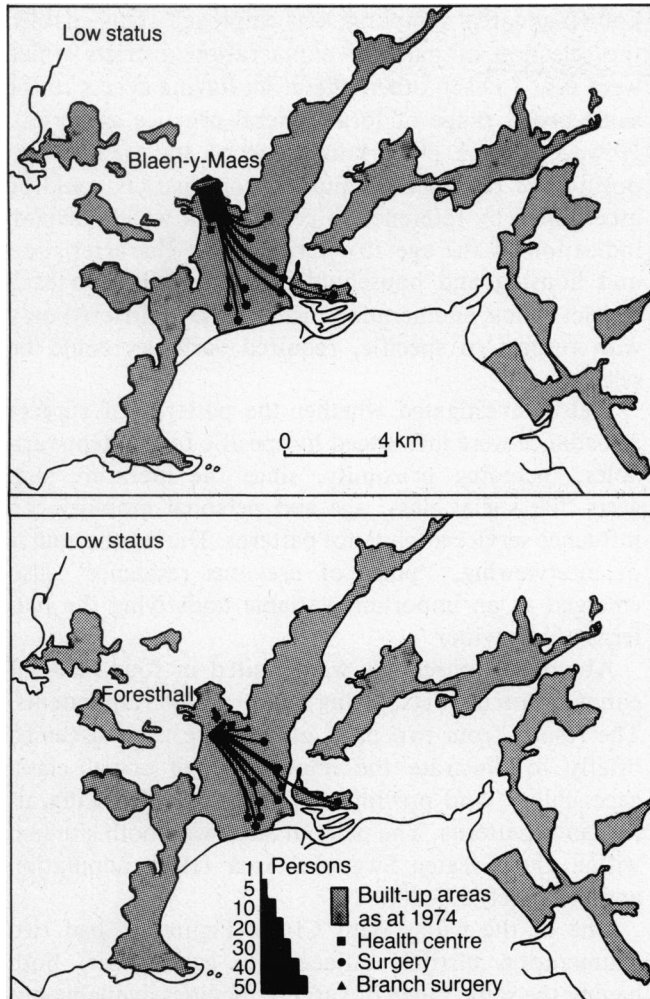


Figure 2. Surgery attendance patterns: Blaen-y-Maes and Foresthall.

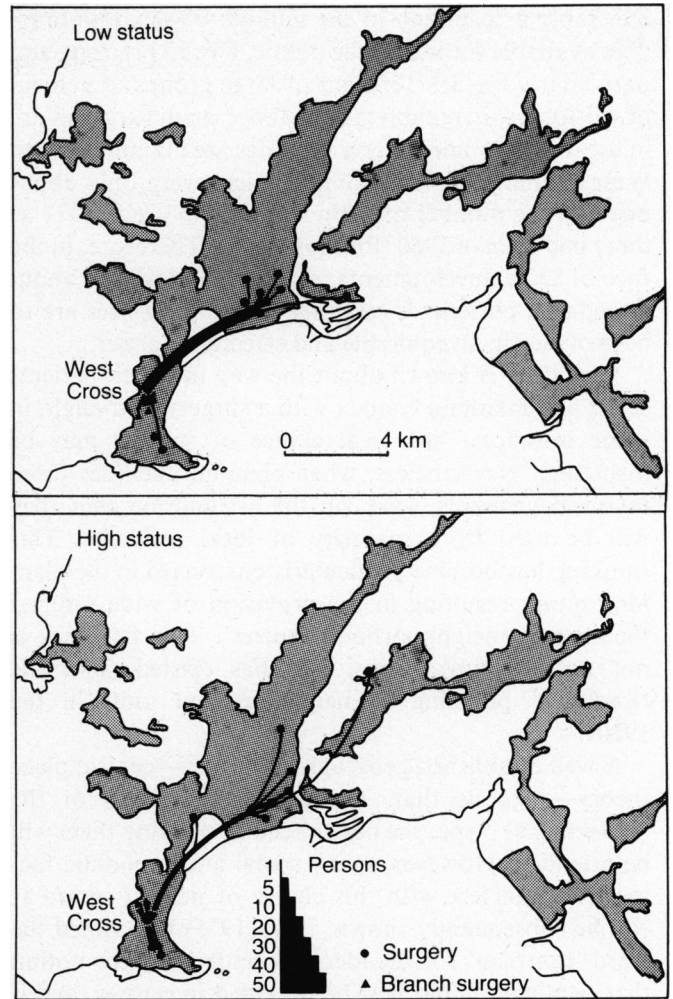


Figure 3. Surgery attendance patterns: West Cross.

facilities of half a mile (Hillman *et al.*, 1973).

### Results

Figures 2 and 3 show flow-line diagrams which represent proportions of respondents attending at specific surgeries. The 'nearest centre' hypothesis is manifestly inadequate as in no site did more than 57 per cent of respondents attend their nearest surgery and the proportion falls to 21 per cent in the West Cross high status site (Table 1). However, the West Cross low status respondents were attending a local surgery (a branch surgery of a more distant practice) in considerable numbers, in contrast to their higher status neighbours who appeared to prefer to attend a somewhat more distant main surgery.

Surprisingly large proportions of respondents in all sites were bypassing their nearest or second nearest surgeries to travel considerable distances to the doctor. Fifty-six per cent of Blaen-y-Maes respondents and 39 per cent of those from Foresthall were going more than two miles to a surgery. The difference in proportions attending the large local health centre can probably be explained in terms of proximity: the Foresthall site was

very close to the health centre and 57 per cent of its respondents attended there. However, only 39 per cent of respondents from the more distant Blaen-y-Maes site attended this surgery. The explanation could be that, once a surgery is beyond easy walking distance and some form of private or public transport has to be used, other facilities may be visited, possibly because they are considered to be more attractive to respondents for some reason. This seemed to be a reasonable assumption for this pair of low status sites.

Thirty-five per cent of West Cross low status respondents were attending surgeries outside the local area altogether, whilst only 23 per cent of high status respondents were doing so. Thus, it appeared that the high status respondents were displaying a 'variable' usage of local surgery facilities, but not necessarily attending their nearest surgery. In contrast, the low status respondents seemed to be displaying a dual attachment, some attending nearby facilities but over a third going to quite distant facilities. This is surprising if one expects low status households to have lower levels of transportation availability and therefore to be inclined to use local facilities. The distant surgeries these respondents were attending were mainly in the central Swansea area, but

**Table 1.** Proximity of surgeries attended by respondents.

	Blaen-y-Maes LS		Foresthall LS		HS		West Cross LS	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Nearest surgery	19	38.8	28	57.1	11	20.8	26	50.0
Second nearest surgery	1	2.0	1	2.0	14	26.4	4	7.7
Third or more distant surgery	29	59.2	20	40.9	28	52.8	22	42.3
Total	49	100.0	49	100.0	53	100.0	52	100.0
$\chi^2$	3.38				12.35			
Significance	0.5 > p > 0.1 (Not significant)				p < 0.001			

LS = Low status site.  
HS = High status site.

**Table 2.** Distances travelled to surgeries by respondents (percentages).

	Blaen-y-Maes	Foresthall	West Cross	
	LS	LS	HS	LS
No doctor	2.0	0.0	0.0	0.0
0-½ mile	0.0	57.1	47.2	57.7
½-1 mile	0.0	0.0	30.2	0.0
1-2 miles	42.0	4.1	0.0	7.7
2+ miles	56.0	38.8	22.6	34.6
Total	100.0	100.0	100.0	100.0

LS = Low status site.  
HS = High status site.

relatively good public transportation was available along a main route from West Cross to Swansea. This suggests that public transportation can, as found in other spheres of consumer behaviour, enable low status persons to attend more distant facilities than would otherwise have been possible.

Other specific variables were included in this research to test their influence on patterns of surgery attendance and to examine whether they had greater explanatory significance than did purely social status differences. A discussion of the variables included now follows.

## Discussion

### Personal mobility

Personal mobility of respondents is an obvious variable for consideration when the use of medical services is being examined. Personal mobility is usually taken to refer to the very broad concept of "... the capacity that a person possesses for getting around ... ." (Hillman *et al.*, 1973). Personal mobility, especially when enhanced by the possession of a private car, is very much influenced by social status. However, in the past, possession of a car by a household has sometimes been assumed to give equal mobility to all members of that

household. This is an unrealistic assumption because not all members of the household may be able to drive and the car may not be available for daytime visiting facilities in particular. Therefore, 'car availability' is in many ways a more realistic variable for collection in social surveys. During the course of this research, 'car availability' was discussed with respondents as well as the mode of transport they normally used to attend surgery (Tables 3 and 4).

If 'ease of attendance' is a main reason for choice of surgery, then it might reasonably be expected that those attending more distant surgeries would be the more mobile. This was examined in the light of the knowledge gathered about respondents' mobility and the modes of transport used when attending the surgery.

The West Cross high status respondents appeared to be displaying variable usage, mainly of local facilities, whilst the low status group appeared to have a 'dual attachment', some to local facilities, others to more distant facilities in the central areas of Swansea city. This behaviour can, to some extent, be related to the availability of a car. Sixty-two per cent of low status

**Table 3.** Car availability and proximity of surgery attended (percentages of respondents).

	Nearest surgery	Second nearest surgery	Third or more distant surgery	Total number (= 100%)
<i>Blaen-y-Maes</i>				
car available	40.00	0.00	60.00	5
car unavailable	38.64	2.27	59.09	44
<i>Foresthall</i>				
car available	33.33	0.00	66.66	9
car unavailable	62.50	2.50	35.00	40
<i>West Cross high status</i>				
car available	19.35	25.81	54.84	31
car unavailable	22.72	27.27	50.00	22
<i>West Cross low status</i>				
car available	40.00	6.66	53.33	15
car unavailable	54.05	8.11	37.84	37

**Table 4.** Mode of transport and distance to surgery.

	Blaen-y-Maes					Foresthall				
	0-2		2+		Total	0-2		2+		Total
	Number	Percentage	Number	Percentage		Number	Percentage	Number	Percentage	
<i>Mode of transport</i>										
Walk	1	4.8	0	0.0	1	24	85.7	0	0.0	24
Public transport	17	80.9	25	89.3	42	3	10.7	13	68.4	16
Private transport	3	14.3	3	10.7	6	1	3.6	6	31.6	7
	21	100.0	28	100.0	49	28	100.0	19	100.0	47
$\chi^2$	1.55					33.31				
Significance	Not significant					p<0.001				
	West Cross High status					West Cross Low status				
	0-2		2+		Total	0-2		2+		Total
	Number	Percentage	Number	Percentage		Number	Percentage	Number	Percentage	
<i>Mode of transport</i>										
Walk	24	60.0	0	0.0	24	27	81.8	0	0.0	27
Public transport	1	2.5	1	8.3	2	3	9.1	9	52.9	12
Private transport	15	37.5	11	91.7	26	3	9.1	8	47.1	11
	40	100.0	12	100.0	52	33	100.0	17	100.0	50
$\chi^2$	13.44					30.26				
Significance	p<0.01					p<0.001				

Grand totals do not in all cases correspond to those in Table 2 as certain respondents did not visit surgery and always received home visits.

respondents without a car available to them travelled to local facilities whilst only 38 per cent of these persons went beyond their nearest or second nearest surgeries (Table 3). For high status respondents the availability of a car was associated with a greater tendency to travel to a distant surgery, and 55 per cent of high status respondents with a car available went to a third or more distant surgery (even if this was not more than a two mile journey). Similar behaviour was, in fact, seen among West Cross low status respondents with cars available, although relatively fewer of these households actually had cars available.

Walking to the surgery remains an important way of reaching local facilities among respondents of all statuses (Table 4). Sixty per cent of high status and 82 per cent of low status respondents in West Cross would walk to surgeries when using nearby ones. Eighty-six per cent of the Foresthall respondents attending the local health centre walked the short distance to it, but only five per cent of Blaen-y-Maes residents were able to walk to the surgery. This placed them at an important relative disadvantage, because a bus journey was involved for 81 per cent of respondents attending the local surgery and for 89 per cent of respondents going to a surgery more than two miles distant. Private transport

was rarely available for respondents in this low status pair of sites.

Very few high status respondents in West Cross (or in other high status sites in the original survey, which are not reported here) attended surgery by public transport, yet fairly large proportions reported that cars were 'normally unavailable' to them. This suggests either that a special effort is made to secure the use of a car on a day when surgery is to be attended or, perhaps in addition, a higher incidence of lift giving amongst high status respondents. The fact that a relatively small proportion of West Cross high status respondents without a car available attended their very nearest surgery (23 per cent) serves to emphasize that lack of mobility is possibly not a very great deterrent to their visiting more distant facilities. Conversely, the importance of public transportation in allowing respondents to attend more distant facilities is emphasized in all three low status sites (Table 4).

*Age differentials*

As well as differences in mobility, the literature suggests that age can be an important variable affecting consumer behaviour, even if its precise influence is hard to evaluate (Thomas, 1974; Hopkins *et al.*, 1968). During

the current research project, information was collected about the age of respondents and about the presence in households of pre-school age children (who might be expected to generate increased demands for general practice services). However, in general, no significant differences were found in distances travelled to surgeries by respondents in different age groups. Neither did the presence in a household of pre-school age children appear to be systematically related to distances travelled to surgery. In other spheres of consumer behaviour, e.g. shopping, concentrations of young children have sometimes been found to cause spatial restriction of behaviour patterns. The fact that this does not appear to be so with regard to the use of general practice services could be because, as a general practitioner is usually attended for a number of years, the arrival of a child in a household may be viewed as an event which will only temporarily increase the need for contact with the doctor. Therefore, an alteration of spatial behaviour may well be avoided, because a change of doctor at this stage may be undesirable for many reasons. This contrasts with the position in, for example, shopping, in which short-term (and temporary) adjustments to spatial behaviour may be made more easily to accommodate different needs associated with the family life cycle.

#### *The influence of previous residential history on surgery attendance patterns*

It has been noted that some people, on moving home, attempt to maintain links with services of various kinds in their previous areas of residence. This tends to be most marked for higher order facilities (such as large department stores), whilst contacts with lower order services, such as petrol stations and newsagents, may well be 'broken' after a move (Lloyd, 1977). This may be viewed essentially as a reassessment of the comparative importance of familiarity with services versus distance to them. The general practitioner is, in many ways, a 'local' personal service, but it is still felt to be very desirable for patients to build up a personal relationship with him. Such a relationship is usually best based upon longstanding mutual knowledge by general practitioner, patient and patient's family. In the present research, many respondents cited as a reason for attendance at their surgery that it had been nearest when they had been living at a previous address and/or that they had attended the practice "since childhood". Therefore, as well as the social status and mobility differentials noted earlier, an historic element appeared to be a potentially important variable which could help to explain the establishment of current attendance patterns.

It is well known that different social groups display differing levels of residential mobility, both within towns (intra-urban) and between towns (inter-urban). Herbert (1972) has illustrated that higher status families are more likely to be residentially mobile at an inter-

urban scale than are low status families, with high status professional workers moving from one area of the country to another for career reasons. As a result, professional persons in areas are often not of local origin, whilst tenants of local authority residences in particular tend to be constrained in terms of inter-urban movement as their tenancies are not usually transferable from one local authority area to another. At the intra-urban scale, however, patterns of mobility do tend to be more complex although, even at this level, high status household moves tend to be of a greater distance than low status moves. Therefore, it seems possible that at both inter-urban and intra-urban scales, movements of high status households might be of too great a distance to allow them to retain their previous doctors. Conversely, the lower status movers, travelling over shorter distances, might be able to retain general practitioners in previous areas of residence.

Analysis of previous areas of residence and current general practice surgery attendance supported the above hypothesis well in all of the sites in the original research. In the two areas reported, complex cross-tabulations were initially prepared but it was eventually decided that fairly simple 'regionalizations' of previous residential areas and general practice locations were adequate (Table 5). This was because relatively well-defined residential areas exist in West Glamorgan, as well as quite distinctive concentrations of general practice facilities in specific localities.

The pair of low status sites, Blaen-y-Maes and Foresthall, display a marked relationship between area of original or previous residence and location of surgery attended. Parts of the flow to general practices in north and central Swansea illustrated in Figure 2 are to lower status residential areas in which respondents had previously lived. Considerable numbers of respondents reported having been rehoused from these older, inner city areas to the newer, peripheral council estates in these two sites. This had occurred during post-war demolition and redevelopment in the central city, but residential changes had *not* been accompanied by concurrent adjustments to register with general practitioners in the vicinity of the new homes. The higher values on the diagonals for sites, shown in Table 5, illustrate this well. Few respondents originally from these sites go outside the area to attend a doctor: only two respondents from Foresthall and three from Blaen-y-Maes did so.

Therefore, in geographical terms, it may be assumed that the 'attraction' of central city surgeries is not sufficient to overcome the 'friction of distance'—the increased travelling which would be involved to visit them. Thus, local facilities tend to be used unless a stimulus for change develops (for example, from some dissatisfaction with local surgeries). Conversely, a large degree of what geographers might refer to as a form of locational *inertia* is apparent, illustrated by the proportions of respondents originally from outside the area

**Table 5.** The influence of previous residence upon surgery attended.

	Area of previous residence (percentages in parentheses)				
	Site: Blaen-y-Maes				
	Local area	Swansea north	Swansea central	From outside area	Total
<i>Practice attended</i>					
Local practice	10 (76.9)	2 (11.1)	3 (23.1)	5 (100.0)	20
Swansea north	1 (7.7)	14 (77.8)	0 (0.0)	0 (0.0)	15
Swansea central	2 (15.4)	2 (11.1)	10 (76.9)	0 (0.0)	14
<b>Total</b>	<b>13 (100.0)</b>	<b>18 (100.0)</b>	<b>13 (100.0)</b>	<b>5 (100.0)</b>	<b>49</b>
	Site: Foresthall				
	Local area	Swansea north	Swansea central	From outside area	Total
Local practice	17 (89.5)	3 (20.0)	2 (25.0)	6 (85.7)	28
Swansea north	0 (0.0)	8 (53.3)	0 (0.0)	0 (0.0)	8
Swansea central	2 (10.5)	4 (26.7)	6 (75.0)	1 (14.3)	13
<b>Total</b>	<b>19 (100.0)</b>	<b>15 (100.0)</b>	<b>8 (100.0)</b>	<b>7 (100.0)</b>	<b>49</b>
	Site: West Cross high status				
	Local area	Swansea central	Swansea elsewhere	From outside area	Total
Mumbles/West Cross practice	22 (100.0)	6 (40.0)	5 (62.5)	8 (100.0)	41
Swansea practice	0 (0.0)	9 (60.0)	3 (37.5)	0 (0.0)	12
<b>Total</b>	<b>22 (100.0)</b>	<b>15 (100.0)</b>	<b>8 (100.0)</b>	<b>8 (100.0)</b>	<b>53</b>
	Site: West Cross low status				
	Local area	Swansea central	Swansea elsewhere	From outside area	Total
Mumbles/West Cross practice	26 (96.3)	4 (19.0)	3 (100.0)	1 (100.0)	34
Swansea practice	1 (3.7)	17 (81.0)	0 (0.0)	0 (0.0)	18
<b>Total</b>	<b>27 (100.0)</b>	<b>21 (100.0)</b>	<b>3 (100.0)</b>	<b>1 (100.0)</b>	<b>52</b>

who retain a general practitioner in their previous area of residence. Of the few people originally from Blaen-y-Maes and Foresthall who had changed to a more distant general practitioner, at least two families had been constrained to look outside the immediate area following disagreement with local doctors.

In West Cross, the influence of previous residence is similarly well marked. In the low status site, 17 out of 21 respondents who formerly lived in Swansea itself still attended Swansea central general practices as opposed to local West Cross surgeries. Conversely, only one low status respondent initially from West Cross had changed surgery to attend a Swansea general practitioner, whilst no low status site respondent coming from further afield than central Swansea had retained a previous general practitioner.

High status attendance patterns also reflected this influence of previous residence. All of the high status respondents from the local area were registered with local surgeries, whilst 60 per cent of respondents originally from central Swansea were still attending Swansea surgeries. All of those respondents coming from outside the area and 63 per cent of respondents from more distant parts of Swansea had registered with surgeries in the West Cross or Mumbles area (Table 5).

This section suggests that historic factors are of great importance in explaining surgery attendance patterns. The variable 'place of previous residence' appears to be highly significant in influencing spatial patterns of utilization behaviour; in the original research these were called 'relict patterns of travel' to surgeries. In terms of geographical central place theory, or in terms of current health care delivery concepts, many respondents seem to be out-of-phase with the policy of using nearby 'neighbourhood' health centres or surgeries.

### Conclusions

In an analysis intended to provide empirical data on current surgery attendance patterns, a number of behavioural variations among groups of respondents have been highlighted. Certain differences in attendance patterns between low status and high status respondents were evident, the former appearing to display, to some extent, a dual attachment to both nearby and more distant surgeries. The latter tended to use local surgeries but not necessarily the nearest, this being, to some degree, a result of greater personal mobility made possible by higher rates of car availability. For low status respondents, the enabling factor of convenient

public transportation routes allowed attendance at more distant surgeries, usually at surgeries in former residential areas in the city centre.

Neither the age of respondent nor the presence of young children in households appeared to be systematically related to distance travelled to surgery. More importantly, the question of 'relict patterns of travel' arose. This is important as it serves to emphasize that, to date, the selection of a general practice remains a matter of personal choice. The desire to maintain a link with a doctor known to the family or respondent for a long time appears to be stronger than any wish to minimize the distance travelled to the practice premises. Accessibility to a surgery may be only a secondary consideration to a person who wishes to retain contact with a previous family doctor.

It is therefore a matter for concern if planning policies move towards too strict a regulation and designation of practice catchment areas. It may be felt to be desirable for a degree of flexibility to be built in to future policies towards registering with general practitioners in Britain.

Patterns of surgery usage seem, in many cases, to have developed more or less 'organically', and do not conform to any planning norms. In the initial research, in a site not discussed here, relatively little choice of surgery was available and the lowest overall levels of satisfaction with general practice services were found (Phillips, 1979). Provided the more distant patient does not increase workload and does not feel himself to be a burden to the family doctor, it can be suggested that mutual arrangements between doctor and patient, with regard to retention on lists, should continue to be permitted, even if practice catchment area delimitation is further encouraged. Many general practitioners, of course, are also anxious to retain patients of longstanding on their lists.

So, I suggest that, if reasons for requiring attendance at local or neighbourhood centres are purely those of administrative convenience, they may be challenged on the grounds of current attendance patterns. It is very desirable that further empirical research be carried out in this general area, particularly on the net effects of distance upon surgery attendance and domiciliary visiting rates. In addition, any 'trip suppression' due to distance should be investigated because, if this were found to exist, it could be a valid reason for requiring patients to register with nearby surgeries. Only when detailed empirical data are collected can policies be rationally planned and justly implemented.

#### References

Herbert, D. T. (1972). *Urban Geography: A Social Perspective*. Newton Abbot: David and Charles.  
 Hillman, M., Henderson, I. & Whalley, A. (1973). *Personal Mobility and Transport Policy*. London: Political and Economic Planning.

Hopkins, E. J., Pye, A., Solomon, M. & Solomon, S. (1968). The relation of patients' age, sex and distance from surgery to the demand on the family doctor. *Journal of the Royal College of General Practitioners*, 16, 368-378.  
 Knox, P. L. (1979). The accessibility of primary care to urban patients: a geographical analysis. *Journal of the Royal College of General Practitioners*, 29, 160-168.  
 Lloyd, R. E. (1977). Consumer behaviour after migration: a reassessment process. *Economic Geography*, 53, 14-27.  
 Low, N. (1975). Centrism and the provision of services in residential areas. *Urban Studies*, 12, 177-191.  
 Office of Health Economics (1974). *The Work of Primary Medical Care. Studies of Current Health Problems, No. 49*. London: OHE.  
 Parkin, D. (1979). Distance as an influence on demand in general practice. *Epidemiology and Community Health*, 33, 96-99.  
 Phillips, D. R. (1979). Public attitudes to general practitioner services: a reflection of an inverse care law in intra-urban primary medical care? *Environment and Planning A*, 11, 815-824.  
 Phillips, D. R. (1980). *Contemporary Issues in the Geography of Health Care*. Norwich: Geobooks. In press.  
 Richardson, I. M. & Dingwall-Fordyce, I. (1968). Patient geography in general practice. *Lancet*, 2, 1290-1293.  
 Royal College of General Practitioners (1977). *Trends in General Practice*. London: *British Medical Journal*.  
 Smith, D. M. (1979). *Where the Grass is Greener*. Harmondsworth: Penguin.  
 Thomas, C. J. (1974). The effects of social class and car ownership on intra-urban shopping behaviour in Greater Swansea. *Cambria*, 1, 98-126.  
 Vaughan, D. H. (1967). Dispersion of patients in urban general practice. *Medical Officer*, 117, 337-340.

**PARDALE FOR PAIN RELIEF**  
**PARDALE FOR PAIN RELIEF**  
**PARDALE FOR PAIN RELIEF**  
**PARDALE FOR PAIN RELIEF**  
**PARDALE FOR PAIN RELIEF**

**Paracetamol 400mg Codeine Phosphate 9mg  
 Caffeine Hydrate 10mg**

Full product information available on request

 **Dales  
 Pharmaceuticals Limited**

Snaygill Industrial Estate, Keighley Road,  
 Skipton, North Yorkshire BD23 2RW  
 (Tel: 0756 61311)

PL 0123 5015