SPATIAL ACCESS, NEED AND EQUITY

AN ANALYSIS OF THE ACCESSIBILITY OF PRIMARY HEALTH FACILITIES FOR THE ELDERLY IN PARTS OF EAST KENT

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THESIS

DECLARATION

The author hereby declares that

1) The composition of this thesis is wholly her own work;
2) The research reported herein embodies work conducted during the period of her registration at the Urban and Regional Studies Unit, University of Kent at Canterbury;
3) Except where reference is made to the work of others, the research reported is the original work of the author.

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SUMMARY

The medical care produced by the National Health Service can be regarded as a form of impure public good, partly because medical care is available from health facilities with varying spatial accessibility for the population. The cost of health care may be inequitable since 'subjective' as well as 'objective' friction of distance can affect the cost for individuals of obtaining health care. Information on'perceived' and 'objective' spatial access to health facilities is therefore relevant to planning decisions for health service provision. The elderly represent a client group that is particularly likely to experience poor spatial access to facilities, yet they have a high need for services. Also individual elderly people with certain characteristics are especially susceptible to problems of spatial access to health care. Clearly the spatial organization of service facilities is also significant in any study of variation in spatial accessibility between clients.

An empirical study was made of primary care facilities in East Kent, focusing on aspects of spatial access for elderly residents of two Medical Practice Areas. Location-allocation analysis of surgery positions demonstrated how their spatial organization might influence aggregate travel costs and variation in travel costs for clients. A survey was conducted of a sample of elderly respondents drawn from a group particularly likely to experience access difficulty. 'Perceived' difficulty of access to the doctor's surgery among interviewees was found to be associated with 'objective' indicators of low accessibility and was inequitable in view of their health care needs. Individual and aggregated responses suggested some explanations for the perceptions recorded. The implications of the study for public service provision to the elderly are considered.

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PART I

THEORETICAL PERSPECTIVES ON SPATIAL ACCESS, NEED AND EQUITY IN HEALTH CARE PROVISION

CHAPTER I

AN APPROACH TO PROBLEMS OF SPATIAL ACCESS, NEED AND EQUITY

Two main themes are introduced in this chapter, which are of fundamental concern in this thesis. These are, the question of what is a just pattern of spatial accessibility to facilities providing public goods; and the problem of the criteria to be used in assessing how far spatial access corresponds to a just distribution. These themes are developed in later chapters where they are dealt with in the context of provision of health services, particularly for the elderly. The discussion here reviews the body of theory relevant to a study of equity in the spatial accessibility of facilities providing public goods, and commences by considering what is the nature of public goods, and how they may be distinguished from other types of goods.

Various definitions of a public good have been offered by writers seeking to distinguish how public goods differ from private sector goods. These authors have looked to the mode of production and of consumption as the key to the distinction. For example, Steiner (1978,p.31) suggested that public goods are those in which the state is involved, directly or indirectly, in production of goods which are different from those produced by the private sector, and for which there is a public demand.

Samuelson argued that public goods are for collective consumption, that is, they are provided for all members of society and are available at no cost, or at a subsidized cost at the point of consumption. Consumption of public goods by an individual will have an effect on other members of society. (Samuelson 1970, p.156-160).Buchanan (1968, p.56-57) has also distinguished between public and private goods from the point of view of consumption. Pure public goods were defined as those "for which consumtion is strictly equal and quality is homogeneous, so that there is no inter-personal quality-quantity variability". This is the case for the

provision of defense, for example. These may be contrasted with private goods which have "no spillover benefits or harms arising from their production or consumption" and for which "each demander's preferences (are) satisfied independently and separately". Buchanon recognized, however, that the commodities obtained from public service systems do not entirely correspond to this definition of a pure public good, and he has introduced the concept of the impure public good. This is intermediate between the extremes of pure public and private goods, and may be defined as a good which is provided collectively, but for which consumption may vary in quantity and quality between recipients. Thus,

> "...each person's consumption or utilization of the service must be considered separately as an independent public good."
>
> (Buchanan, 1968, p.67)

Public services are considered here as systems of provision of certain goods which are operated by a society collectively, using public resources, because it is impractable or unacceptable to provide these goods through the supply and demand systems of the private market (Smith, 1977, p.78). This public control of provision is necessary because the objective of a public service is to ensure that the products of the service will be made available to members of society in a quantity, and at a cost, which are considered appropriate by society as a whole.

Studies in various fields of social science have provided evidence that availability of public services may vary because of real and perceived barriers which must be overcome by the consumer in order to obtain the service. These barriers produce inequalities in the real 'cost' to consumers of public services because they operate differentially for different individuals and groups of clients. They occur for various reasons including the 'friction of distance', financial limitations, inadequacies of education and social divisions between different groups in society. These will be discussed in further detail, in the context of the

health service, in Chapter 3. To some extent the descriptions offered by the academic community for these hurdles in life's rat race vary, and the predictions of likely winners and losers depend on which discipline is consulted for a tipster. The causes cited for the existence of these barriers, the assessments of which are the most significant causal factors and the means advocated for overcoming the obstacles vary between disciplines. For example, the geographer's view tends to lead him to suppose that distance to facilities will present a barrier to availability, and might prescribe a reorganization of the spatial distribution of facilities to reduce these barriers, seeing the source of inequality between individuals as one of relative location. Political economists tend to view the problem in terms of the inequality of income, and may recommend a redistribution of wealth or power as a solution to the problem. In fact these different viewpoints all highlight different aspects of an interrelated set of factors tending to produce inequality. It may be necessary, in order to tackle the problems defined by one discipline in social science, to borrow solutions provided by others. For example, Harvey (1973) has interpreted the location of population in relation to facilities and amenities as a factor contributing towards real income, thus posing a geographical problem in economic terms. Dear (1974) advocates a geographical approach which would encompass concepts from the theory of organizations and decision making.

Therefore, a number of different barriers are likely to be responsible for the 'impure' character of public goods, and in concentrating on one cause of inequality, one must not become so blinkered as to lose sight of the broader scope of the problem. However, it is particularly the existence of spatial barriers which is of interest here, and this viewpoint requires that the public service system be considered initially in terms of its organization in space.

It is possible to think of a service system as a spatial network. Writers such as Haggett (1965), Tietz (1968) and Massam (1975) have produced typologies of service systems on the basis of their spatial organization. A good illustration is the example of the doctor's surgery. General medical care (provided through the National Health Service by GP's operating from the surgery offices) may be interpreted in terms of Haggett's 'geographical synthesis' as a service system consisting of demand and supply points (patient's homes and surgeries), and the communication links between them, making up service areas. To go further, using the concept proposed by Tietz, it is possible to classify the medical service system according to its geometric properties (point patterns and networks), direction of flow, and the relationship between the system and its field of concern. Massam has developed this classification into the typology shown in Figure 1a. For example, each doctor has a number of patients on his practice list, and the service system by which his practice operates is of Type 1, being provided at a limited number of supply points (surgeries) to serve a more numerous and widely distributed set of demand points, representing the residential locations of the practice population. A good deal of the doctor's work requires personal contact with the patients; reliable diagnoses, for example, are difficult to make without examining the patient, and for treatment to be administered, the doctor must generally see the patient. For a consultation to take place, either the patient or the doctor must travel the distance between the location of the doctor's surgery and the patient's home. A spatial barrier may be created by the 'costs' (in time and effort as well as money) of overcoming the friction of distance. Thus the friction of distance is relevant to the accessibility of medical services, and spatial access has a significance for the availability of these services to the population, which is considered in greater detail in Chapter 2.

The importance of spatial accessibility extends to all public services provided at facility centres, since the residential location of individuals in the service population, in relation to the position of the facility, will vary, and the costs of overcoming the friction of distance will also be variable. Thus any services provided from facility centres to serve a more widely distributed population (Massam Type 1) must be considered to be impure public services in terms of Buchanan's definition. This point has been developed particularly by Harvey, and he has used another type of public service to illustrate his argument:

> "The very fact of location of a public facility such as a fire station (or for that matter any public service) means that the population does not enjoy exactly homogeneous quality and quantity of fire protection as far as consumption is concerned, even though they have the same quantity and quality of fire protection available to them in terms of production....All localized public goods are 'impure' and the externality exists as a spatial field of effects."
>
> (Harvey, 1973, p.59-60)

If a public service is impure because it is provided from central facilities, so that its accessibility varies for different individuals, then the question arises of whether the inequality in accessibility results in inequity. The pattern of accessibility may be thought to be inequitable if if is detrimental to a socially just distribution. Thus, one is led to consider how to define a socially just distribution and what criteria may be used to determine the equity of access to public service facilities for the population.

Economists working in the field of public service provision have interpreted the problem of the distribution of resources for public services as an economic model, involving inputs of resources (such as finance, equipment, facilities and knowledge and manpower) and their relationship to outputs (improvements in the welfare of society). This approach is exemplified by the work of Culyer et al. (1972), Davies (1977d) and Knapp (1979). According to this view, the need judgement may be interpreted as

a form of cost benefit analysis. Culyer et al. have explained how the cost benefit decision must be made by the agent responsible ('the Minister'), by attaching values to different levels of need for outputs from public provision, and weighing them against the cost to society of achieving these outputs for the individuals concerned. Thus 'the Minister' measures the "intensity with which society needs each of a variety of outputs" (Culyer et al, 1972, p.96).

Ultimately, 'the Minister' should be concerned to achieve socially desirable outputs which are final outcomes, resulting from consumption of public goods. However, in practice, decisions must be made in terms of need for intermediate outputs, in the form of public goods themselves, (Knapp, 1979).

It has therefore been assumed here that 'the Minister' is concerned to measure needs for intermediate outputs, on the assumption that in meeting these needs, the 'final' objectives of public service provision will be met. These intermediate outputs may also be interpreted as representing different 'levels' of public service objectives, which are defined in terms of their relationship to the final outputs expected from public service provision. The relationships of different 'levels' of public service outputs are considered here in the context of provision of health services. It is demonstrated in Chapter 2 that the following explanation of National Health Service objectives corresponds to the consensus view expressed in Ministerial policy statements.

1) The aim of the NHS is to promote the best possible health for all.
2) Good health is promoted by medical care and, therefore, individuals should consume medical care in proportion to their medical needs. Consumption of health care in proportion to medical need thus represents an intermediate output of the first (highest)'level'.
3) In order to make such a pattern of consumption possible, the necessary health care must be made freely available to all individuals. Free availability in proportion to need is therefore an intermediate output

of the second 'level'.

4) As argued above, various factors affect the availability of health care, including spatial accessibility. An intermediate output of the third 'level' is therefore a degree of spatial access to facilities providing health care which does not reduce availability for any individual needing to use them. It is assumed that 'the Minister' is concerned to achieve this objective in the way which will be of least cost to society.

These arguments imply that a group comprising people who are all likely to have poor health and, therefore, need to consume health care should all have a degree of spatial access which does not significantly reduce availability of health care. (Ensuring this pattern of spatial accessibility is one aspect of public intervention designed to enable free consumption of health services in proportion to need, thus promoting the best possible state of health for all.) The evidence presented in Chapters 2 and 4 demonstrates that the elderly are an example of such a group. Furthermore, according to this argument, if a member of a group of this kind experiences difficulty of access which presents a barrier to service availability, then their position is unacceptable to society, (provided that the individual does not in fact have good health and no need for health care.) It has been assumed in the research reported here that 'the Minister' will be concerned to identify any such individuals for whom spatial access limits availability of services they need, and will seek the least costly method of reducing the barrier of spatial access to health facilities which exists for them.

The preceding arguments assume a view of social justice which stresses the importance of the individual (eg. that of Rawls, 1967), rather than a utilitarian approach. They also reflect, at the level of the individual, Davies' concept of territorial justice between areas, which he has defined as follows:

> "....an area distribution of provision of service such that an area's standard is proportional to the total needs for the service of its population."
>
> (Davies,1968,p.39)

Social justice is assessed, therefore, on the basis of need rather than other possible criteria such as merit or contribution to the common good. It is not the purpose of this thesis to debate the merits of such an approach over other possible conceptualisations. The concern was rather to find how it is possible for 'the Minister' to discover whether there are individuals among the elderly population for whom spatial access reduces the availability of health service facilities, and, if so, whether their situation is inequitable in terms of the formulation of social justice outlined here.

In seeking this information, 'the Minister' is faced with a number of questions. To whom should 'he' apply for information about those for whom spatial access reduces availability in a way which is inequitable? Which information precisely does 'he' ask for? How does 'he' evaluate the significance of different data sources in order to determine who needs intervention to improve, or compensate for, poor spatial access? Generally speaking 'the Minister' is presented with two alternative groups of informants: on one hand, the professionals and experts working in the field of service provision, (for example, social workers, doctors, academics); on the other hand, consumers of the services provided, (such as patients, recipients of social benefits and social services, and all the members of the general public likely to be effected by service provision). Bradshaw (1972) has proposed a classification of the types of information likely to be made available to 'the Minister' relating to need for public service intervention. According to this classification, 'social need' may be normative, comparative, felt, or expressed.

The information obtained from professional and experts is likely to be either normative or comparative. Need of the normative type is determined

in relation to "a desirable standard", which is "laid down and is compared with the standard that actually exists - if an individual or group falls short of the desirable standard then they are identified as being in need". Comparative need is "found by studying the characteristics of those in receipt of a service. If people with similar characteristics are not in receipt of a service, then they are in need." (Bradshaw, 1972, p.640-641). The comparative measures of need are useful because they attempt to relate causal factors to the existence of need, enabling predictions of need from such factors, an approach favoured by Davies;

> "The best evidence usually available about what factors cause needs are strong associations between specific characteristics and judgements about people's degree of need...."
>
> (Davies, 1968, p.16)

There are several important advantages of need assessments of these types. They are as 'objective' as is possible, since they are determined using generally agreed standards of provision and are, therefore, relatively consistent. Also they are based on an understanding of the system of provision and its mode of operation, and an overall view of the service population to which they refer, rather than individual cases considered in isolation.

Nevertheless, they do have their limitations for various reasons. The normative standards laid down are not absolute, although they represent a measure of consensus, and views about appropriate definitions may vary. This is partly because experts hold differing views about what are significant aspects of need, and also because "there is a wide scope for disagreements about the effects of social action" (Walton, 1969, p.15). Even generally agreed standards may change through time because of developments in knowledge and changing values held in society, which is a problem for 'the Minister' if he is concerned to plan resource allocations for the long term. Furthermore, normative standards may be "tainted with the charge of paternalism" (Bradshaw, 1972, p641). Boulding has explained this

problem in the context of need for health services;

> "The need concept is criticised as being too mechanical, as denying the autonomy and individuality of the human person...in its extreme form it takes on the flavour of "What you need is what I as your professional advisor have to give you; what you want is quite irrelevant."
>
> (Boulding, 1966, p.204)

Comparative measures of need may also have inadequacies. Although cases may be compared one with another and provision standardized for areas or individuals with similar characteristics, the questions still remain of whether the relevant characteristics are being assessed, and whether the pattern of provision which provides the standard is appropriate to meet needs effectively. There is a danger that a given level of service or a particular type of provision will be accepted as the norm simply because it happens to be the existing pattern.

> "The difficulty in this situation is to define the significant characteristics... The definition is more commonly used in an ad hoc way - a crude rule of precedence to assess the eligibility of selective services."
>
> (Bradshaw, 1972, p.641)

The information which might be supplied to 'the Minister' from consumers and the general public is more likely to consist of data about 'felt needs' or 'perceived' needs, either collected in social surveys of consumer preferences, or as presented by interest groups on behalf of the social groups they represent. Alternatively, it may take the form of 'expressed need', based on "felt need turned into action" by those who make applications to public service organizations requesting service provision. This latter measure of need is recognized as being the most easily acquired measure of consumer preferences, being readily available from the records of providers, petitions etc. It is at the same time the least adequate, since it often represents only the tip of the iceberg, as the greater proportion of perceived need is not acted upon and remains obscured from the view of the social administrator by the murky depths of social and economic

processes which are imperfectly understood.

The disadvantages of this source of information about needs are often held to outweigh the advantages. Subjective measures of need based on consumer perceptions are open to criticism because the value systems and aspirations of consumers which affect perceptions are so variable and difficult to assess. Felt needs are also likely to reflect only the viewpoint of the individual consumer concerned, and not to take account of the effects of meeting such demands on other consumers, or on the efficiency of the public service system as a whole. Davies (1976, p.9), therefore, criticized the use of subjective measures to assess public service outputs on the grounds that they imply a "crudely hedonist philosophy of social action".

A further problem involved in the use of felt need as a basis for need judgements is the extent to which perceptions depend upon relative deprivation. The concept of relative deprivation has been developed by Runciman, and described by him as follows;

> "We can roughly say that A is relatively deprived of X when (i) he does not have X, (ii) he sees some other person or persons, which may include himself at some previous or expected time, as having X (whether or not this is or will be in fact the case), (iii) he wants X and (iv) he sees it as feasible that he should have X. Possession of X may of course mean avoidance or exemption from Y".
>
> "Relative deprivation should always be understood to mean a sense of deprivation; a person who is 'relatively deprived' need not be 'objectively' deprived in the more usual sense that he is demonstrably lacking in something. In addition relative deprivation is such as to involve a comparison with the imagined situation of some other person or group. This other person or group is the reference group, or more accurately the comparative reference group."
>
> (Runciman, 1966, p.10-11)

Thus the individual's assessment of the extent to which his own situation is deprived, relative to the situation he desires, will depend upon the group with which the comparison is made. Runciman explained that the legitimacy of claims of relative deprivation may be debatable, since individuals may be misinformed and may base their perceptions on an erroneous frame of reference. The legitimacy of relative deprivation can be resolved

finally only by referring to a theory of social justice. In the case of relative deprivation with respect to public service provision, it has been argued above that the yardstick of social justice is provided by the objectives which society lays down for public services through legislation and government policy statements.

For all these reasons, consumer perceptions of selective need for services may be at variance with those of the professional provider of services, as demonstrated by Glastonbury's study of public views about policies for social service provision (Glastonbury, et al, 1973). Thus 'subjective' and 'objective' needs judgements are liable to conflict.

Nevertheless, there are some advantages to 'subjective' consumer assessments of needs. One of these is that, for reasons of democracy, it is useful to have some indication of the views of the members of society who, when all is said and done, cooperate in the provision of funding for public services and are the population for whom the services are provided. This democratic value of including consumer perceptions in assessments of need for public services is particularly desirable since those most in need of the services are often those who are, at the same time, least adept at influencing society through the political process. However, perhaps the strongest argument for considering felt need as a useful measure of social need is that, by assessing the perceptions of consumers of public services, it may be possible to learn more about the reasons for their behaviour and and causes of their needs. Boulding has raised this point;

> "In effect the author's paper....must also be seen as a plea for study of certain related social phenomena and their dynamics, for example, study of the perceptions of need as more promising than the concept of need itself. Basic to such a study would be examination of those matters which create saliency for perception within a social system. Perception depends on that and behaviour depends on perception."
>
> (Boulding, 1966, p.223)

However, Donnison has made the point that merely taking account of the perceptions of individuals in policy making is not the most constructive

way of improving public provision;

> "...our preferences are, in part, products of this economic, social and spatial structure: to rely wholly on them as a guide to collective action is to endorse and preserve the structure itself. It follows that governments genuinely determined to give equal freedom to all their citizens cannot sit back and merely respond to popular demands; they must intervene to ensure that people's choices are not so confined as to make a mockery of equality of opportunity."
>
> (Donnison, 1975, p.423)

Donnison suggested that the policy maker should rather take account of three groups of factors apertaining to the individual's preference structure; historical factors, the processes by which preferences are shaped through time by the individual's social and physical environment; sociological factors, or the extent to which individuals act as members of particular social or territorial groups, rather than in isolation, and urban characteristics indicating to what degree the actions of individuals in the use of one set of facilities are associated with their choices and preferences relating to other activities in their daily lives.

Faced with the evidence from professionals and experts which is 'objective', based on standards which are to some degree established by a consensus of opinion, and with data from consumer perceptions which are 'subjective', and based on less consistent standards, there is an understandable tendency to give greatest weight to the former. However, consumer preferences and assessments have some peculiar merits as shown above, and it would be useful to incorporate them into policy judgements. Subjective judgements of need are of value especially because the superiority of normative evaluations of need over assessments of felt need on grounds of their objectivity may be limited. It is probably not justifiable to claim that, with our present state of knowledge about the causes and nature of social needs, we are able to assess need fully using normative measures alone. This is not to argue that normative measures based on expert assessments are not of any use, or that subjective consumer assessments are

the only valid measure. Rather, the two aspects should be considered together to build up a more complete picture of social need, in the manner suggested by Bradshaw, or by Smith, who concluded that;

> "...the informed judgement of students of society, augmented by positive knowledge of actual social concerns, seems the most likely route to the specification of criteria of human well-being at present."
>
> (Smith, 1977, p.32)

In order to adopt such an approach successfully, however, it would be necessary to analyse perceptions in the manner proposed by Donnison, to try to explain the reasons for their occurence. Data on felt need are likely to be most useful when collected together with more objective data about individual subjects. These would permit the researcher to look for associations between the individual's perceptions and the factors which would be expected to affect relative need according to a normative need judgement. If particular perceptions are found to be held by significant numbers of consumers, and in a way which reflects consistent patterns of the circumstances likely to affect the well-being of the consumers consulted, then there might be a stronger argument for taking consumer satisfactions into account. The information is then less likely to result from individual's idiosyncratic dispositions and attitudes and more likely to reflect 'genuine' needs, as felt by consumers 'typical' of certain groups. Furthermore, the characteristics which are found to be associated with perceived needs are of interest, since they may suggest which are the most significant need creating circumstances. Such an approach would also be compatible with this statement by Davies;

> "...we are not arguing that we can add people's satisfactions but that we can add the need creating circumstances that affect satisfaction."
>
> (Davies, 1968, p.20)

The 'salient' aspects of the perception of consumer groups, which Boulding recommended the student of social policy to consider, may have

relevance to the problem of spatial access to public services. It seems likely that the individual will assess the spatial accessibility of public facilities subjectively and make decisions about use of those services on the basis of his or her perceptions about ease of access. This supposition is supported by the work of geographers using the 'behavioural' approach to the study of spatial organization of society. 'Behavioural geography' enables further progress towards explanation of the ways in which people organize their lives in space. This is because the behavioural approach is unique in geography in that it takes account of the mental field of individuals and groups of people and their perceptions of the opportunities offered by their environment. The findings from research in behavioural geography are discussed in Chapter 3.

Using this type of approach, it will be demonstrated that it is possible to analyse how the accessibility of public service facilities, measured objectively, is likely to be interpreted by groups in the population with different perceptions of the barriers imposed by any given degree of spatial inaccessibility. This information, combined with data for individuals about objective measures of access, may make it possible to develop indicators of need for access which correspond more closely to the operational milieu governing clients' actions in obtaining public services. To obtain such information the researcher must first discover what are the perceptions and preferences held by individuals in the population relating to the distribution of public service facilities, and, second, look for associations between these perceptions and information about the individuals' frames of reference, the social groups to which they belong and the action spaces within which they carry out their daily lives. (The concept of the action space is discussed in greater detail in Chapter 3). Research of this type might provide those responsible for the

implementation of territorial justice with the necessary information to formulate planning activities which would have effects beyond short term allocations to alleviate needs as they occur. This would enable progress towards modifying circumstances which tend to create inequalities between individuals and social groups in their ability to perceive, and make use of, the opportunities available to them for access to public services.

Such an approach also requires the policy maker to consider different sectors of the public service system as part of a whole rather than planning for allocation in each sector in isolation. This is because a study of perceptions of consumers may show how changes in provision to improve the service in one sector of public provision may create need for provision from other parts of the public service system. The assessment of spatial access to services illustrates this point particularly clearly, since public transport available to those needing services is not always adequate to ensure access to facility locations where the services may be obtained. The discussion in Chapter 2 develops the question of provision of transport services to ensure spatial access to primary health services, and considers the problems of operating concessionary public and voluntary transport schemes for access to essential services.

The approach to the study of public service provision adopted here may, therefore, be summarized as follows. Public resources are input to the public service system with the aim of producing public goods and services as efficiently as possible. That is, to provide the highest possible desired outputs, in the form of needs met, in proportion to the magnitude of the inputs. The desired outputs from public services are defined by government policy and legislation, and in Chapter 2 the objectives of the National Health Service in the provision of primary health care facilities are reviewed. For most public services, including health care, there are variations in social and spatial access resulting partly from the

variations in the circumstances of consumers, which govern their opportunity to use services, and their perceptions of the availability of services. These factors are discussed in Chapters 3 and 4. The spatial accessibility of services will also depend upon the organization in space of the facility system, and methods of assessing the 'spatial efficiency' of facility locations are, therefore, considered in Chapter 5. If the pattern of spatial accessibility of service facilities does not correspond to a socially just distribution, then the system of provision causes inequity, and, therefore, is inefficient in achieving its desired outputs. In order to discover whether the pattern of spatial access to services is socially just, it is necessary to consider 'objective' measures of availability, (corresponding to those which might be obtained from experts concerned with public service provision), and also 'subjective' assessments by consumers of services. These types of information will aid in establishing what methods of provision and allocation are likely to be most effective in meeting social need, and in modifying inputs in order to more efficiently produce the required outputs from public services. The factors which are likely to be relevant to normative and felt need for access to services will be reviewed in Chapters 3 and 4, where special attention will be given to the position of the elderly.

The principal area of concern in the following chapters, therefore, is one part of the information relevant to the needs judgement, that relating to variation in spatial access to health facilities, as indicated by 'objective' and 'subjective' measures. The questions are considered of the causes of this variation, whether it is inequitable, and whether it should have a bearing on the need judgement. These issues have been examined by means of an empirical study, reported in Part II of the thesis, in which research has been conducted on the spatial accessibility of primary health facilities for the elderly residents of parts of East Kent.

CHAPTER 2

NATIONAL HEALTH SERVICE PROVISION AND THE PROBLEM OF SPATIAL ACCESS TO PRIMARY HEALTH FACILITIES

In this chapter the National Health Service is considered as an example of a particular sector of public service provision. Certain aspects of the history of the NHS since it was established are discussed, illustrating its objectives and its status as a service producing impure public goods. Some of the assumptions embodied in health care planning will be discussed showing their significance to this study. One part of the NHS, that concerned with primary care, is given special attention because, it is argued, spatial accessibility is particularly significant for these services. The organizational structure of the health service is shown to exhibit an important spatial dimension which is described in this chapter, indicating the way in which catchment areas have been delineated and the arrangement of administrative systems for planning resource allocation. The schemes used to organize resource allocation for primary care between areas are considered, to show the methods employed to promote territorial justice in the distribution of facilities. The need for information about availability of health services at the local level, is discussed. It is demonstrated that availability and accessibility are important indicators of how far allocation procedures and health service provision are actually achieving the objectives of the National Health Service. Methods for improving the spatial accessibility of primary health facilities by transport services provided through the Health Service and other agencies are also considered, demonstrating the social costs of increasing spatial access.

THE CREATION OF THE NATIONAL HEALTH SERVICE AND ITS OBJECTIVES

The British National Health Service commenced operation in 1948, following its statutory creation in the National Health Service Act of 1946. This Act stipulated that,

> "It shall be the duty of the Minister of Health.... to promote the establishment in England and Wales of a comprehensive health service designed to secure improvement in the physical and mental health of the people of England and Wales and the prevention, diagnosis and treatment of illness, and for that purpose to provide or secure the effective provision of services."
>
> "The services so provided shall be free of charge, except where any provision of this Act expressly provides for the making and recovery of charges."
>
> (Parliament 1946 b, National Health Service Act,Part 1)

The Act, therefore, makes plain the Minister's responsibility to provide a freely available and comprehensive health service which will promote good health. Some authors have questioned the assumption that health services are good for our health. For example, Illich (1976) has suggested that modern medicine may have a detrimental effect on health and society's capacity to cope with ill-health. There is perhaps, in view of this debate, a case for referring to the products of the NHS as <u>medical</u> care services rather than <u>health</u> care. The retention of the term 'health care' in this thesis, however, is an indication that the assumption that health services are desirable and beneficial will be accepted. This is justifiable particularly since the main concern of the study will be with primary care which, as explained below is directed as much towards preventative as curative medicine and which escapes most of the criticism by writers such as Illich, whose comments are particularly directed towards advanced hospital medicine, especially in the field of acute illness.

The principle of a comprehensive health service established the pattern of availability of health care which the Minister must seek to promote. This principle had been set out in the Beveridge Report on

Social Insurance and Allied Services which advocated a comprehensive social policy to contend with the 'five giants' of Want, Disease, Ignorance, Squalor and Idleness and was based on 'three particular assumptions'; "the assumptions of children's allowances, of comprehensive health and rehabilitation services and of maintainance of employment". The second of these, 'assumption B' envisaged that:

> "....A comprehensive national health service will ensure that for every citizen there is available whatever medical treatment he requires in whatever form he requires it; domicilliary or institutional, general, specialist or consultant, and will ensure also the provision of dental, opthalmic and surgical appliances, nursing and midwifery, and rehabilitation after accidents....the service itself should i) be organized....by departments responsible for the health of the people and for positive and preventative as well as curative measures, ii) be provided where needed without contribution conditions in any individual case."
>
> (Parliament, 1942, para.427)

These principles are also summarized in the 1944 White Paper which adopted the general recommendations of the Beveridge Report, and recognized two dimensions to the 'comprehensive' character of the proposed National Health Service:

> "The proposed service must be comprehensive in two senses - first that it is available to all people and second that it covers all necessary forms of health care".
>
> (Ministry of Health, 1944,p.9)

These statements of public policy demonstrate that the objective of the National Health Service is to provide health care which is freely available to all in proportion to need. The National Health Service Bill stated that:

> "All the service or any part of it is to be available to everyone in England and Wales. The Bill imposes no limitations on availability - eg. limitations on financial means, age, sex, employment or vocation, area of residence or insurance qualifications".
>
> (Parliament, 1946,para.4)

Thus there should be no significant barriers to health care consumption to any individual due to factors other than medical need. In order to ensure

free availability, provision of primary and hospital health care is funded to a large extent using public resources and without charge to consumers at the point of consumption. Standard charges are payable for some health care, for example, pharmaceutical, ophthalmic and dental services, but these do not generally represent the full cost of provision of the service. Furthermore, children and the elderly are exempt from these charges, which is one indication that these two groups in the population are considered to have particularly great need for health care.

The NHS may thus be considered as a public service producing 'public goods' as defined in Chapter 1. The nature of NHS goods and services is such that they should be considered as impure public goods. This is partly because the health needs of individual members of society vary and therefore the health services they consume are variable in quantity and quality, so that each client's consumption may be considered separately. This variation is very desirable, since as far as health service provision is concerned, one man's meat is another man's poison. The medical treatment given to one individual because of his particular state of ill health may be quite unsuitable, possibly even dangerous, to another whose health status is different.

However, because consumption is on an individual basis, the question also arises of how far the circumstances of groups or individuals may affect the availability of services which are appropriate for them. Factors influencing availability of health services are considered in more detail in Chapter 3, which is concerned with the factors influencing use of health services. Given that such variations in availability do exist, they are inequitable if they present barriers to service availability for those needing health care.

PRIMARY HEALTH CARE AND THE DEVELOPMENT OF HEALTH CENTRES

So far the discussion has been concerned with the National Health Service as a whole. However, before considering some aspects of the organization of the NHS as they relate to questions of the spatial distribution of facilities, it is necessary to consider the character of primary health services which are of principal interest in this study.

Primary care is the sector of health service provision which will receive the greatest attention in this study since it is the area of health care provision in which the behaviour of patients has the greatest bearing on the use of the service. In hospital medicine the use of health services is generally controlled by the referral decisions of those in the medical profession and these decisions are usually made after the patients have already made contact with the medical services. This first contact, on the other hand, is generally with the primary care sector, which is at the interface between the health service providers and the service population, and is determined at least as much by the patient's own decision making as by that of medical advisors. It is in the field of primary care, therefore, that the perceptions and behaviour of clients have greatest significance to utilization and accessibility of health care, and the factors involved will be discussed in more detail in Chapter 3.

Primary health care (or community care) is the term applied to those services provided outside the hospital by general practitioners, nurses, health visitors and other staff in the doctor's surgery, in clinics in special institutions for the handicapped and impaired, and in the patients' homes (Hicks, 1976, p2-4). The Health Service Authorities, the medical profession and the local government authorities are all involved in the provision, administration and planning of primary care, and it is a sector of health service provision which is being accorded a new significance in current thinking on health care. At present, therefore, there is a good deal

of debate over the objectives of primary care and the best ways of achieving these through the allocation of resources to various services and facilities in different regions.

Parker et al (1976) analysed the views of GPs, social workers and patients about the goals and attributes of primary health care in America, and from the results compiled the following definition of the features of this sector of health care. This also seems to approximate fairly closely to the type of primary care now considered desirable in Britain.

> "Primary care provides basic services, including those of an emergency nature, in a holistic fashion ie. taking into account the broad array of causative factors and the patient's total life situation. It provides continuing management and coordination of all medical care services with appropriate retention and referral to other levels. It places emphasis, when feasible, on the preventative end of the preventative-curative spectrum of health care. Its caring services are provided equitably in a dignified, personalized and caring manner."
>
> (Parker et al., 1976,p.428)

Recently, it has been increasingly suggested that such a combination of services cannot be fully provided from the traditional individual GP's surgery, nor from a centralized District General Hospital. Draper (1967) proposed a new form of organization of health services incorporating community care units, each serving populations of 25,000 to 50,000 and providing facilities for general practice, district nursing and pharmacy, dentistry and outpatient services, diagnostic facilities and special services. Inpatient services would be provided in more centralized inpatient units serving populations of 100,000 - 200,000, and the most specialized services would be provided at the regional level in special clinical units. As yet, there has been little indication of a policy of development of community care units on the comprehensive scale envisaged by Draper. However, current trends have favoured the establishment of health centres which bear several similarities to the CCU concept. These are discussed in more detail here, since they represent a change in the mode of organization of primary health service facilities and manpower at the

local level which is likely to influence the spatial distribution of facilities (and their availability for clients in different parts of districts), by changing catchment areas for primary care facilities.

The concept of the health centre was first proposed in Britain in the 1920's when the Dawson Report (Ministry of Health, 1920) argued for two types of centre for health service facilities; primary centres staffed by GP's, and secondary centres staffed by specialists. Hall et al(1975) discussed the subsequent development of policies toward the creation of health centres. With the establishment of the NHS in 1948, there was considerable scope for health centre development. In the National Health Service Act of 1946, part 3, section 21 (1) local authorities were made responsible for the provision, maintainance and equipment of health centres with facilities for services including all, or any of the following list; general medical, dental, pharmaceutical, outpatient, health education and social services. However, due to lack of financial resources and uncertainty as to the most desirable form of health centre facilities, the health centre programme failed to gather any momentum in the 1940's and 1950's. During this period, alternative arrangements for primary health care facilities were more popular, in particular group practices grew in number, partly due to the introduction of the Group Practice Loan Scheme in 1953.

In the 1960's, however, interest was revived in the health centre concept. At this time local authorities were responsible for the provision of health services and the plans of local authorities in England and Wales for primary health centre development were analysed in a document issued by the Ministry of Health. The following quote from this publication indicates the trend which had become apparent;

> "A striking feature of the present returns is the large number of additional health centres....forecast....Compared with 68 envisaged by March 1974....in the first revised plans, 284 are now proposed by March 1976.... There is a growing realization among both parties that effective medical care in the community calls for their closest cooperation, and this can be best achieved in health centres where the family doctor can enjoy the use of modern premises and daily contact with local authority staff and facilities".
>
> (Ministry of Health,1966,p.16)

Further evidence of the growth in the numbers of health centres is provided in Table 2:1 showing numbers of centres in operation and built until 1973, which illustrates the rapid progress made during the early 1970's when more health centres were constructed than during the whole of the preceding period since 1948.

Another development emerging in the recent history of primary care provision has been a clearer definition of the type of organization to be expected in a health centre with regard to staffing, service provision, capacity and position in space. For example the most suitable size and capacity of health centres has also been discussed more frequently in the recent literature. In terms of numbers of GP's able to practise from one centre, the trend appeared to average group practices of 15 or 20 doctors serving population of around 30,000. This was confirmed by Carstairs and Howie;

> "The target size of 30 - 40,000 population is taken as that for which a fairly full range of health services, other than inpatient treatment could efficiently be provided. It is estimated that populations of this size would create sufficient demand to justify the provision of a radiographer, physiotherapist and chiropodist and that it would be feasible to provide outpatient services in the following specialities; orthopaedics, geriatrics, mental health, paediatrics and obstetrics."
>
> (Carstairs and Howie, 1972, from Hicks 1976, p.546)

The optimal location for a health centre has also been outlined. In the Ministry of Health publication Buildings for General Medical Practice it was suggested that;

> "In new developments....the potential list size may be dictated by the geographical limits imposed by natural barriers, the ease of access by walking or infirm patients, public transport systems etc., all of which will also effect the location of the practice building."
>
> (Ministry of Health, 1967,p.14)

For example, in Milton Keynes health centres to serve populations of 25,000 to 30,000 have been planned at locations which represent focal points in the transport system and are close to other welfare and social service facilities.

While this sort of optimal arrangement may be feasible in newly developing communities, in areas where the distribution of population, transport systems and services are already established, the optimal type of organization may need to be adapted to suit existing conditions. The special problems of rural populations may also result in departures from generally accepted norms.

> "Rural areas pose an opposite problem to those of large health centres. In many instances the population is not sufficient to require a group practice of six doctors. These areas will be frequently remote from the district general hospital and consequently the general practitioner may have to undertake some work that would in urban areas be done in the hospital. We believe that the benefits of group practice can be brought to these areas by having a central group practice centre appropriately sited for the best communications. This main centre would contain all the more sophisticated facilities and the ancilliary staff. Strategically sited in the surrounding areas would be satellite units which would be visited by doctors and other staff at suitable times. We have seen admirable examples of this type of centre in the West Riding of Yorkshire and have been told of similar ones in Cumberland.
>
> (DHSS 1971a,p.48,para.110)

The rural areas mentioned in the quote above exemplify cases where the health centre concept has been adapted to suit local conditions and particularly to overcome problems of accessibility of centres.

As the definitions of how a health centre should be organized have become more explicit, statements of the objectives have also become rather more comprehensive, and two descriptions are quoted here of the purpose of a health centre. The DHSS laid down the following objectives;

a) for health centres as a whole;

> "To make available to a particular community all the facilities required to maintain its members in their optimum state of health, either directly or by referral to more specialized agencies or irstitutions."

b) for clinical sessions;

> "To make accessible to members of the catchment community such clinical advice and skills as they may need (other than certain specialist skills) in a form acceptable to them."
>
> (DHSS, 1973,p.30)

According to Carstairs and Howie;

> "The health centre programme is founded on the belief that integration of services will provide more effective cooperation and thus care for the patient and it is the intention that a full range of general medical and dental services and local authority services will be available in this setting."
>
> (Carstairs and Howie, from Hicks 1976, 1972,p.546)

Clearly these objectives bear a close relationship to those outlined for primary care as a whole and suggest the potential importance of the health centre concept as a means of promoting community health care provision. Furthermore, the government proposals for public expenditure allowed for an additional resource allocation to health centre development while in other NHS services capital expenditure was to be cut (Parliament, 1976). Health centres are therefore likely to play an increasingly significant role in the distribution of primary health care to the population and it is clear that as a system of provision they offer considerable benefits. However, it is necessary to consider also whether any additional costs are likely to be incurred as a result of introducing health centre facilities. Additional costs may be generated due to greater distances to be travelled between clients' homes and the health centre for the distribution of primary care such as general medical services previously available from more dispersed surgeries of individual doctors or group practices.

Bevan (1973) has raised some of these questions in his health centre research programme. Similarly, Sumner has concluded from her study of primary medical care in health centres that problems of access may occur for particular client groups although access may not be reduced for the service population as a whole. Those most likely to have problems of access are the clients who are most likely to be in need of care, for example, mothers with young children and the elderly (Sumner, 1971). The characteristics of clients, particularly the elderly, which make them prone to problems of access to health care are considered in chapters 3 and 4.

THE SELECTION OF THE STUDY AREA: THE KENT AREA HEALTH AUTHORITY

The Kent Area Authority was of interest in this study with respect to the question of the move towards health centre provision because it had been comparatively slow to introduce health centres as facilities for the provision of community care. Therefore the process of transition to the health centre system and a greater centralization of primary health facilities could be observed as a relatively recent phenomenon. It seemed likely that the effects of change would be more apparent than in other areas where health centres had been operating for a longer period.

The 1966 review of local authority plans for community health care shows that the Kent County Council and the Canterbury City Borough Council (who were responsible for health care provision prior to the reorganization of the NHS) had no plans at all for health centres although, at the time a total of 284 centres were planned in England and Wales.
This seems to have been partly due to the attitude of the local authority administrators at the time who were not in favour of the health centre solution to community care provision. At this time alternative methods of providing primary care were being pursued and the plans included projects for maternity and child welfare clinics, training centres and hostels for mentally handicapped patients, centres and homes for the elderly and physically handicapped. General practice was carried on from individual or group practice surgeries. The emphasis was therefore on separate units for each speciality rather than the more integrated organization in a health centre.

Since reorganization of the health service in 1974, the Kent Area Health Authority has been responsible for the planning of health services and facilities in Kent and this Authority has shown greater interest in the development of health centres. As a result, at the time this research was conducted, there were six health centres operating in Kent at Gillingham,

Strood, Rochester, Whitstable, Dover and Paddock Wood. These varied considerably in the capacity and range of services made available. Funds were available for creation of more health centres in the Kent Area and the Area Authority envisaged a cyclical programme in which each year at least one health centre would be commencing operations, one will be under construction and another would be planned. In 1977 centres were under construction at Chatham and Faversham, and further centres for Rainham, Dartford, Canterbury, Aylesham and Broadstairs were at the detailed planning stage.

The Kent Area was therefore selected for special consideration in this research. It was thought suitable for a case study partly because, as the discussion above has shown, the introduction of health centres is still taking place and the question of centralization of primary health care is therefore a current planning issue; secondly, because the population includes a large proportion of elderly people. Two towns where these conditions applied particularly were Broadstairs and Whitstable. The towns are similar in population size (Whitstable 25,130, Broadstairs 20,051) and both have a large proportion of elderly people comprising over 30% of the total. Both were resort towns on the coast attracting a large number of retired residents. In Whitstable, at the time of the study, a health centre had recently been opened which replaced the previous group practice surgeries distributed in five different locations throughout the town. This had been in operation since 1974. In Broadstairs the separate surgeries were still in operation but planning for a new health centre was at an advanced stage and a site for the centre had been decided. Most of the local doctors had indicated that they would use this facility. Thus Broadstairs and Whitstable were both examples of retirement towns with a large elderly population where the primary health care system was in transition from surgery provision of the traditional type to more centralized health centre facilities.

THE ADMINISTRATIVE STRUCTURE OF THE NHS

This research was particularly concerned with the way in which health services are distributed in space and the way in which this affects spatial access to health care for clients. In order to discover the reasons for the distribution of facilities it was necessary to understand the administration of the NHS and the processes by which resources were distributed between areas. This required a consideration of the historical development of the health service administration.

The administrative structure of the NHS as it was established in 1948 is shown in Figure 2a. Central government responsibility for health service provision rested with the Ministry of Health. At the regional level there was a three fold division of responsibility for health care between the local authorities (which were to provide community health care), the Executive Councils, (which organized the general medical care provided by general practitioners, dentists, opticians and pharmacists), and Regional Boards and Teaching Hospital Boards (which were concerned with hospital services and specialist medicine). The latter controlled a subordinate tier of administration (The Hospital Management Committees) responsible for particular hospitals. The success of the NHS was dependent upon the cooperation of General Practitioners which was obtained only after assurances were given that the doctors were to be paid solely through capitation fees based on the size of practice. The doctors were therefore in the position of independent contractors to the NHS rather than salaried employees and they have retained this status. With regard to the provision of an equitable distribution of manpower resources in general medical services, this situation represents a problem, which is considered in further detail below where methods of planning resource allocation are discussed.

By the 1960's the problems arising from the NHS structure were beginning to be appreciated and a movement towards reform was initiated. The inadequacies

of the health services organization were highlighted in the Porritt Report (Medical Services Review Committee, 1962) in which a reorganization of the NHS into 'Area Hospital Boards' was suggested. This report was followed by a number of official publications discussing various measures for reorganization. Of these, the most significant to the subsequent structural reforms included a Green Paper (Ministry of Health 1968) which recommended a spatial division of NHS responsibilities into 40 or 50 Area Boards each serving a population of between 750,000 and 3,000,000. A report by the Ministry of Health (1962) recommended District General Hospital Units of 125,000 people and the Bonham-Carter report (DHSS, 1969) recommended joint planning of hospital and community services. These publications were followed in 1970 by a second Green Paper (DHSS, 1970) suggesting a division into 90 Area Health Authorities. In 1972 a White Paper (Parliament, 1972) was issued, and supplemented by a publication sometimes referred to as 'the grey book' (DHSS, 1972). The National Health Service Reorganization Act passed in 1973 was based on the structure proposed in the 1972 documents and took effect from April, 1974.

The NHS reorganization was carried out in conjunction with a general reform of the arrangements for health and local government administration. The DHSS in its present form and the reorganization of social services followed the Seebohm Committee Report (Parliament, 1968). Local Government reform outside London took place simultaneously with that of the NHS in 1974. The current NHS structure resulting from the reorganization is shown in Figure 2b. This represents a more unified administration for services which had been organized separately; hospital and specialist services, school health services, general medical services previously administered by the Executive Councils and community health services which had been under the control of the local authorities.

As a result of these changes the Department of Health and Social Security (DHSS) has become more powerful politically with direct access

to the cabinet through the Secretary of State for Health and Social Security. The DHSS has also adopted a regionalised structure which is intended to encourage greater flexibility and integration of resource allocation through the activities of the Central Planning Division. This regional organization and the spatial element of NHS organization which it implies is of particular interest from the point of view of territorial justice and access to health services, since it represents the pattern of territorial divisions used to bring about planned resource allocation. The structure consists of Health Regions, Health Areas and, in some Areas, Health District Divisions.

The Regional Health Areas, of which there are 14 in England and Wales, were first conceptualized in the Second Green Paper. (DHSS,1970) They have been delineated to encompass areas which are each served by a teaching hospital acting as a centre of excellence for medical care and supplying the highest order specialist services from the region. The RHAs are designed to be in close consultation with the DHSS while having greater freedom in the allocation of resources within the region (Hallas, 1974). The RHAs are also responsible for the overall regional strategic planning of health services.

The Area Health Authorities have been planned to be coterminous with the new Local Authority Areas. The Area Authority is composed of 15 members, of whom 4 are representatives of local government. The Joint Consultative Committee is a special arm of the Area Authority created to promote collaboration with the Local Authorities in the provision of health and social care, which is one of the important functions of the Area Health Authority. Area Authorities are also intended to coordinate the administration of health care in the Health Districts, and are expected to have responsibility delegated to them from the Regional Authorities in order to exercise control over the allocation of resources within the area.

Another element of the NHS structure comprises the Family Practitioner Committees which have taken up the function of the old Executive Councils in organizing professionals supplying health care services independently of the NHS system. The FPC operates at the level of the Health Area, and uses Medical Practice Areas (MPAs) defined by the Medical Practices Committee for purposes of administration. The MPAs vary in their mode of delineation, area extent and population size, but have been recently reorganized so that they now correspond broadly with the urban and rural districts of the pre-1974 local government system. The question of MPAs will be discussed in further detail below because of their significance to manpower distribution planning.

The Health Districts are not a statutory tier of the NHS, but are sub-divisions of Health Areas which are too large to be conviently used as geographical units for the organization of health care provision. There are about 200 in England and Wales and they are areas with populations which would support a full range of community health services and hospital care provided by either a District General Hospital (DGH) or several hospitals substituting for the DGH. The population size proposed for a Health District is about 250,000 which was considered suitable to warrant the provision of a DGH, and conveniently divisible into ten units of 25,000 each served by a health centre, or into units of about 12,500 individuals to be served by group practices of general practitioners averaging about 5 doctors per practice. In fact Health Districts do not all correspond closely to this ideal model. The population size varies from 85,000 to 500,000 (Levitt, 1976, p.69) and may be served by an equally variable array of hospital and community services. There are 34 Area Health Authorities which have only a single District.

At the level of the District, management and planning of health services are the responsibility of the District Management Team. The

District Management Team is empowered to establish Health Care Planning Teams to cope with detailed planning for provision of integrated medical care for special patient groups. Community Health Councils have also been set up as part of the district level administrative tier. This body aims to represent grass roots opinion in problems concerning health care at the district level.

Figures 2c to 2e illustrate the relationship of these different administrative and geographical levels in the NHS hierarchy in the area studied in this research. The maps show the Kent Area Health Authority in relation to the South East Thames Regional Health Area as a whole and the District sub-divisions within it. Also shown for the Canterbury and Thanet District are the Medical Practice Areas which indicate the sub-division of the district used by the Kent Family Practitioner Committee. The Kent AHA is coterminous with the County of Kent and had a resident population of 1,426,410 in 1972. The Canterbury and Thanet District is a large one, combining the local government Districts of Canterbury and Thanet, with a resident population in 1972 of 273,030 (Parsons, 1974). Of specific interest in the cases studies reported in this thesis are the MPAs of Whitstable and Broadstairs and St. Peters.

This reveiw of the organizational structure of the NHS and its development since 1948 shows how the nature of the catchment areas of facilities, defined in terms of their service populations, have come to be recognized as an important aspect of the organization of the health service. This incorporation of a geographical element in the organization of health service provision is interesting in the light of some of the concepts discussed in Chapter 1, where it was shown that authors such as Massam have viewed public services as spatial systems.These may be classified on the basis of the spatial relationship between a series of service origins, represented by health facilities with a given distribution, and service destinations

represented by the residential distribution of the service population, which is generally more dispersed, forming a catchment around each facility. However, while the idea of a catchment population has long been employed in health service administration, there has been a tendency to define it in terms of the numerical size of the population and pre-existing local government divisions rather than the extent of the area within which the population is distributed or the pattern of distribution of that population and the actual spheres of influence of service facilities. The question may be raised of how the varying geographical extent of the administrative areas used to organize resource allocation may influence the spatial accessibility of the facilities provided. Those parts of the country where the population is sparsely distributed are likely to be divided into larger geographical units and distances to be travelled to health facilities are likely to be greater. The discussion of rural health centres above showed, for example, that the impact of the trend towards centralization is likely to be different in rural areas from the effects felt in urban regions.

RESOURCE ALLOCATION IN THE NATIONAL HEALTH SERVICE

As explained in the previous section, the administrative system concerned with the planning of health facilities, especially in the area of primary care, involves the National Health Service organization itself, the medical profession, which is linked to the NHS structure through the FPCs and various advisory bodies and the Local Authorities, who liase with the NHS through the Joint Consultative Committees and who, while having no direct responsibility for health care, do provide supportive social services which in the primary health sector especially are closely related to health services, and are involved in issues such as the siting of facilities. This threefold division of interest between semi-independent agencies may pose some problems for the coordination of planning policy and effectively reduce the range of options open to health service planners in the use of

health care resources. For example, the establishment of a health centre involves cooperation both from the GPs who are required to operate from the centre, and the Local Authority which is required to permit the development of such a facility in the context of their district plans.

Within the NHS there are two administrative systems of resource allocation for primary health care provision. First, the administration of family practitioners carried out by the Family Practitioner Committees in the Areas and controlled centrally by the Medical Practices Committee. Second, the hierarchical regional resource allocation planning system headed by the Central Planning Council and operated through the Regional, Area and District Authorities. Both of these administrative structures operate with particular principles and procedures in order to plan resource allocation. Other means of influencing manpower distribution are by negative direction (preventing doctors from setting up practices in over-doctored areas), and by the strategic location of medical schools and facilities for general practice in health centres or purpose-built surgery premises. In 1948 the Report of Committee (Ministry of Health 1946a) chaired by Sir Will Spens, proposed the concept of the capitation fee to be paid to the doctor for every patient on his list, which forms the basis on which NHS payments are made to doctors, with additional payments to be made for specific services. In 1965 the BMA published A Charter for the Family Doctor Service. and after discussion of the charter, the current scheme was agreed upon, whereby doctors with at least 1000 patients, providing full services for a given minimum period each week would be paid a basic capitation fee for each patient. In addition supplementary payments are made for eg., a basic practice allowance, out of hours duty, night visits, vaccinations and immunisations, cervical cytology, maternity and emergency services (Culyer, 1976; Levitt, 1976,Chap.5). Doctors also receive an extra allowance for practising in areas which are designated as under-doctored.

This last payment constitutes one means by which the distribution of doctors throughout the country can be controlled and therefore deserves more detailed consideration here.

For the purpose of assessing levels of provision of GP's in different parts of the country, four types of area are defined on the basis of the average number of people on the doctors' lists, with 2500 adopted as the optimum number of patients which should be registered with any one GP:

Restricted Areas are defined as those where the average list size is less than 1800 and new applications for admission into general practice in these areas is normally refused even for replacement of out-going doctors.

Intermediate Areas are defined as those where the average list size is less than 2200 and in excess of 1800. Applications for admission may be refused.

Open Areas have average list sizes of 2201 - 2500 and admission to practice is normally automatic, although no extra allowance is payable for practising in these areas.

Designated Areas have average list sizes exceeding the accepted optimum of 2500. Not only is right of practice automatic, but GPs are encouraged to these areas by payment of a designated area allowance. Designation is subject to the overspill rule, by which an incoming doctor only receives a special allowance if there are sufficient extra patients to support him (ie. if all doctors in the area were allocated lists of 2500, then the surplus population would exceed 2500). Under the present regulations, two types of allowance are payable; Type 1 for areas with list sizes averaging 2500 - 3000, and a higher allowance, Type 2, for areas where the list size exceeds 3000 on average.

The basis for manpower planning by the FPCs is therefore average size of practice for doctors within Medical Practice Areas. As an indicator of the equity of distribution of the available medical manpower, this

measure has been recognized to be inadequate. Its limitations were discussed by Butler et al. (1971 and 1972), and presented a number of difficulties. It is not necessarily the case that the workload imposed on a doctor can be adequately assessed simply on the size of his practice since other factors, such as social and demographic features of the population, morbidity levels, characteristics of the area, especially environment and communications, and the characteristics of the general practitioners themselves, may effect the doctor's workload and the care he provides. Also, there is no sound basis for defining the optimum practice size as 2500. Further, even if list size were accepted as the single most important factor, the average figure may hide considerable variations between GPs in an area. Also, the geographical divisions used to group practices will effect the average figure, and it was found that "the smaller the unit chosen, the greater appears to be the national shortfall of doctors" (Butler et al. 1972). Furthermore, the area boundaries are not defined on the basis of any consistent criteria, certainly none relating to criteria of efficient population groupings, like those notionally governing the delineation of health districts, or to functional consideration of patterns of utilization. Thus the areas cannot be expected to constitute the best possible zoning of the country for the purpose of considering relative need for GPs between areas. Therefore, it might be more effective to consider the level of provision of doctors in terms of the costs to the patient of access to a doctor as well as the size of the doctor's workload.

Another aspect of remuneration, particularly relevant to the distribution and accessibility of services, is that doctors are paid additional fees for patients on their list whose residential locations are three miles or more away from the doctor's surgery. The rate increases proportionally to every mile in excess of three miles between the patient's home and the surgery. This payment is intended to recoup to doctors the extra costs

of home visiting to patients in dispersed practices. It is interesting to consider whether there is a distance beyond which patients tend to require more home visits due to inaccessibility of the surgery. If this were the case, then doctors would be incurring extra expense on this account also and it might be felt that they should be reimbursed in some additional way to encourage them to continue to provide this part of their service. The question then would be whether demand for home visits is also related to a three mile threshold, or whether some other distance would represent a more realistic criterion. The answer to this question would require information about how distance affects access to the doctor for the patient.

The second part of the NHS planning machinery which will be considered here is that concerned with the distribution through the regions of finances to provide equipment, facilities and salaried labour and expertise necessary for the production of health care. Two aspects of distribution must be planned; the division of expenditure between services and the distribution of resources between areas. The planning system is intended to encourage delegation downwards of responsibility for the actual production of health services 'on the ground' in the Districts. (Levitt 1976 ,p.19) However, official policies do exist in the form of guidelines about the combination of services which are desirable and which sectors of health care should have priority for expenditure, and these policies form the basis for planning allocation of public resources to the regions from central DHSS funds. The systems used to calculate how to divide the health service 'cake' are the subject of continuing and contentious debate, and are considered briefly below.

Policies for resource distribution between services have undergone considerable change in recent years. One aspect of this change was that central policy advocated a shift towards greater expenditure on community care and services for the care of the chronically sick and disabled. This

change in policy was explained in two official publications; the Public Expenditure White Paper (Parliament, 1976) and the DHSS Consultative Document on Priorities for Health and Personal Social Services (DHSS, 1976). Butler (1976) in his analysis of these documents shows that the greatest increases in expenditure suggested would be on primary care and service for the elderly and handicapped with smaller increases in expenditure on general and acute hospitals. Major increases in capital expenditure to develop health centreswere also forecast. These increases were relative and in absolute terms the amount spent on hospital medicine continued to exceed considerably that for primary care. However the trend did perhaps reflect a growing emphasis placed on making primary and non-acute care more available to the population.

There have also been changes in the manner in which resources are allocated between different parts of the country and these may prove to be of greater significance in terms of their effects on the actual services provided. Prior to 1971 the approach for resource allocation between the regions was incremental. Allocation was based on factors such as the number of hospital beds and previous expenditure on staff salaries, so that inequalities inherited from the situation pre - 1946 in the pattern of provision of health care, particularly in the form of hospital beds, facilities and equipment, tended to be perpetuated, rather than reduced. Buxton and Klein (1975, p.345) quoted the example of the Sheffield Region, where the amount of health care provision made possible by existing facilities was lower than in areas such as the South West Metropolitan Area but throughout the 1950's and 1960's Sheffield was allocated a consistently lower amount of financial resources per head of the population than the South West Metropolitan Board.

In 1971 the formula used for determining the regional distribution of resources was modified to take into account factors such as population

numbers, age and sex, in relation to health service use, as well as the numbers of hospital beds and the intensity of use indicated by case flow through hospitals. However, this procedure did not overcome the problems of inequity, particularly since it was applied only to increases in expenditure rather than total allocations. In 1975, therefore, the Resource Allocation Working Party (RAWP) was set up to study the problem of how to make distribution of National Health Service finance equitable by making differential expenditure in the regions correspond more closely to need. Thus recent resource allocation procedures reflect the desire to achieve better the objectives of territorial justice. In 1975 an interim report proposed a system which was adopted for the planning of expenditure for 1976 - 77, and the second RAWP report (DHSS, 1976a) advocated a second revised system to be put into operation for the following year.

The revenue target was calculated according to this new formula by predicting need for seven types of health care; non-psychiatric inpatient services, day and out-patient services, inpatient services for the mentally ill and for the mentally handicapped, community services, ambulance services and family practitioner administration. The needs of the population in each region for these services were predicted on the basis of population size, with weightings where appropriate for expected utilization rates based on sex and age composition, standardized mortality and fertility ratios and adjustments to allow for agency arrangements and inter-regional flows of patients. For example, to calculate the requirements for community services the population was weighted by rate of use according to age group and the standard mortality ratio and the expenditure was adjusted for agency arrangements. It was significant to this research that the size of the elderly population, with high rates of use of health care, would be one indicator of an area's need for health services. This implies that utilization rates reflect need for care. For Ambulance services population

size and regional SMRs were the indicators used. The overall allocation is proportional to the relative health needs of the region's population for each of the seven services as assessed by these indicators.

The implementation of this formula for calculating allocations on the basis of needs indicators has given rise to furious debate within the Health Service, largely because under existing conditions of economic stringency, the size of the 'cake' of public resources for health care has not increased fast enough to keep pace with the rising costs of, and increased demand for, health services. Thus in cutting the cake in a different way, the RAWP system served out a thinner slice for those areas previously receiving most. For these areas, especially the Metropolitan Areas with expensive teaching hospitals to maintain, the new 'Robin Hood' style of procedure was, therefore, unacceptable, and their complaints have been extensively covered by the media (eg. an article in The Times, 4/7/78, under the headline "London Teaching Hospitals fear a 'withering away'"). There was also the problem of how to cope with the silting up of resources due to the constraints imposed on new expenditure by commitments inherited from earlier expenditure, especially capital investment in buildings and equipment.

Further problems were involved in applying the RAWP formula for other reasons. One difficulty was that the indicators used to estimate needs require further improvement to make them more powerful. For example, the question of how far morbidity can be accurately assessed from mortality needs to be researched more fully. Also, the indicators make little allowance for geographical variation in costs of service provision.

Another difficulty was that since the central NHS administration has no direct control over regional expenditure beyond fixing its total amount, there was a danger that the extra resources given to the more needy areas might not be used in such a way as to reduce the inadequacies of service

provision which prompted the larger allocation and regional inequities might be slow to be reduced. (Butler, 1976).

In spite of these practical difficulties, the RAWP report contended that in order to achieve resource distribution according to need it is necessary that resources should be allocated at the sub-regional level on the basis of the same criteria as are recommended for regional distribution.

> "The criteria for establishing Regional differentiation of need and the methods recommended for resolving the ensuing disparities would have no purpose unless applied below Regional level. Indeed, the only way in which our recommendations can have a real effect is to carry them through to the point where services are actually provided - the Areas and Districts."
>
> (DHSS, 1976b, p.37)

The RAWP report proposed that the revenue target for the RHA should form the basis for national distribution within the Region, and the Area revenue targets should be determined by aggregating the District targets. As far as possible national methods should be applied to sub regional allocation decisions. However, the RAWP report recognized that certain adjustments would need to be made to allow for the special problems of allocation at the local level. There would be a need for better information on the costing of patient flows between districts for inpatient and outpatient flows, and on the use of outpatient services by different population groups. This implies that for outpatient and community services as well as for hospital inpatient health care, data on patient movements between districts would be necessary to implement the RAWP proposals at the local level. In order to understand these between districts flows well enough to be able to make predictions about future patterns of movement, it would be necessary also to gain an understanding of the factors which govern patient movement. This might involve a study of how patients move <u>within</u> the district as well as across district boundaries.

In order to plan the allocation of resources to districts in accordance with the distribution of need with a view to meeting this need more

effectively, it would also be necessary to assess more accurately what benefits can be expected from particular modes of public expenditure. The Ninth Report of the Government Expenditure Committee on Health and Social Services (1976 - 77) called upon the DHSS to develop measures of access showing to what degree people in different areas have equal opportunity of obtaining health services and whether access is improving, and also to devise indicators of the quality of provision to measure changes in the physical environment, amenities and patient satisfaction. The need for measures of access to services was expressed in the report as follows;

> "A fundamental problem in using the existing statistics to interpret expenditure is....that the data tells us nothing about the relationship between the services provided and the population served. The long term aim therefore should be to develop population - based indicators of what is happening in the health and personal social services, and to relate changes to resource allocation policies. We need to know whether policy is improving access to the social services (given conditions or circumstances) and whether such access is equally distributed, socially and geographically. This will mean devising new indicators, based on improved sample surveys of the population."
>
> (Parliament, 1977 , p.43.)

If spatial accessibility is likely to affect access to health services, then it is one of the factors for which indicators need to be found and included in a measure of access as proposed in the Expenditure Committee Report. The above quote points the way towards the type of approach which may be used to develop such indicators and which is discussed in subsequent chapters of this thesis.

TRANSPORT SERVICES TO HEALTH FACILITIES

Thus, while the resource planning system used to control the distribution of NHS manpower and facilities is intended to promote territorial justice, it does not preclude the possibility of local inequalities and inequities of spatial access to health care. Furthermore, while the NHS structure in its reorganized form has enabled a more integrated system for the planning

of health services, it has at the same time tended to divide the administration of health services from that of social and other public services by establishing Health Authorities which are essentially separate bodies from local government authorities. This may encourage administrators to view health service planning rather in isolation from the planning of other services. Public transport, for example, is the responsibility of the local government authorities in most districts and the policies pursued will affect access for the population to local health facilities. The following sections consider public transport to health facilities provided through the health service by the ambulance system, and by other agencies in the form of public bus services and voluntary transport schemes.

The ambulance service as a means of access to primary health care

The ambulance service caters principally for transport to hospitals and particularly for transport to outpatient and emergency (casualty) services. The planning of ambulance services must take into account three categories of transport provision; first, a service requiring stretcher ambulances for patients unable to walk or travel sitting, especially in emergencies; second a service plannable at short notice for hospital discharges, etc. which will not require full stretcher ambulance transport; and finally, a sitting ambulance or car service for outpatients, which may be planned well in advance for appointments (Forster, 1977). Emergency services and pre-planned outpatient services are of particular relevance to the accessibility of the outpatient and casualty hospital services considered in this study.

Ambulance services are important in transporting the elderly to health facilities. National figures for the early 1960's show that over 80% of ambulance journeys were for outpatients and 60 or 70% of these were for the types of treatment most often required by the elderly (Ministry of Health, 1964). Similarly in 1974 over 70% of the patients attending a

physiotherapy unit in Harrow by ambulance were over 60 years of age (Beer et al, 1974).

Nevertheless, the ambulance service is over-stretched and unable to meet all the potential demand for it. The problems faced by those operating the ambulance service include the fact that although much of their workload is not concerned with stretcher cases, the service must be able to cope with emergency cases in which patients are unable to walk or travel sitting. Furthermore, the workload is unpredictable, and even when services can be planned in advance, they are not controlled by the operators, but mainly by the general practitioners who order the services. The ambulance service is obliged to meet the doctor's requirements for ambulance transport for patients although these do not always correspond to patients' real needs (Norman, 1977, p.65-67). It is therefore very difficult for operators to rationalize services without careful coordination with all those involved. Such coordination requires some extra cost, for example, in the employment of a Hospital Transport Officer (Ministry of Health, 1964). This would necessitate additional resource expenditure, although this may be repaid by making the service more efficient. The difficulties faced by ambulance service organizers are compounded by the limited budgets within which they have to work.

Provision of ambulance transport is the only way in which the cost of access to hospital health facilities is met from within the health service. Thus, the cost of transport to hospital services will be included to some extent in NHS calculations of the costs of making these services available to the public. As shown above, need for ambulance resources is calculated on the basis of mortality only, with no regard to variation in mobility of the population, which is relevant to need for non-emergency ambulance services in particular.

For other primary care services, such as doctors' surgeries, chiropodists and chemists, the cost of access must be met mainly by individual patients or by other agencies, although home visits by practitioners represent another means by which the friction of distance may be overcome for patients. As explained above, there is expenditure by the NHS in compensating doctors who make home visits over long distances. In the following sections on public transport and voluntary transport schemes, some of the problems, and the social and financial expense, of meeting costs of access to health care from outside the health service are considered.

Reducing the friction of distance to facilities through public transport

In a Consultative Document on Transport Policy, published in 1978, the Department of the Environment sets out four objectives which it recognizes for transport policy in general. These are efficiency, social and environmental objectives and resource conservation. Explaining the social objective, this document states that;

> "People have the right to expect a reasonable degree of mobility, and the social objective of transport policy is to ensure that this is available to all...."
>
> (DOE, 1978,p. 12)

The document also points out one of the basic problems in achieving this objective, that as transport grows increasingly necessary in our society, there is a minority for whom command over means of mobility is declining. This group was of particular interest to this research since they are particularly likely to have problems of access to health care facilities.

The method recommended for intervention to promote the social objectives of transport policy is that of selective, rather than indiscriminant subsidies. Subsidies are seen to be justified in the following cases;

1) For particularly vulnerable groups such as the elderly, the blind and the disabled, and users for whom full fares represent real hardship;

2) For maintainance of an adequate level of service;

3) To avoid excessive fare increases;

4) To support innovation in new types of service.

The consultative document placed with the local authorities the responsibility for meeting social objectives, of ensuring a reasonable degree of mobility for all by means of a "basic transport network". No definition of a "reasonable degree of mobility" or a "basic network" was given. Local authorities were also left to determine the size and nature of subsidies since, it was argued, local circumstances vary and it was important that the most efficient use should be made of the limited funds available for subsidies by applying them in the method best suited to local conditions.

The disadvantage of this arrangement, which was acknowledged to some degree in the Consultative Document, is that local authorities do not always operate the types of subsidy which central government advocates. Thus there are variations between areas in the types of people qualifying for concessions and in the nature and amount of the concessions. The survey of bus concessions published by the Department of Transport (Department of Transport, 1977) showed that the average cost per person taking up concessions offered by the local authority ranged across the country from no expenditure in those areas where concessions were not made available to more than £25 in other areas with most generous concessions. These variations were seen by the NBC to be inequitable, and a similar view was held by some of the respondents interviewed in the survey reported here. The NBC called for a standardization of travel concessions, suggesting that they should be determined by central government in the same way as other welfare benefits. (Times, 6/11/78, p.2, 'Pensioners Getting Poor Deal on Bus Fares'). Attention was also drawn to the fact that financing discriminatory concessions from the revenue from fares at the expense of passengers who pay the full fare was neither politically expedient nor practical, since in most cases fares were already high and close to the limit of what passengers were prepared to pay.

Graham and Cookson (1975) described the types of concessionary schemes which are operated throughout the country, by means of bus passes or permits, tokens or tickets, or the operation of special bus services. Bus passes, granting a certain amount of reduction of the fare of each journey made, have the advantage of giving the greatest concession to those using the bus most frequently. However, they pose a problem for administration since it is not possible to predict the use which may be made of each pass, and the operator finds it difficult to evaluate the costs of the scheme. This makes the calculation of local authority subsidies problematic. The token or ticket system overcomes this difficulty, since concessions are given to the value of the tokens issued. The problem with such a system is to distribute the tokens according to need for bus travel amongst the population.

A further complication involved in establishing appropriate subsidies for either type of concession is that it is not known how far the provision of concessions may affect use of bus services. There is some evidence to show that demand for bus travel is elastic with regard to the price of fares, and that additional use may be stimulated by fare reductions (eg. Skelton, 1977). Some revenue increases to the farebox may therefore result from the introduction of concessions.

The operation of special buses for use only by those qualifying for concessions has the attraction to operators of enabling them to use buses at off-peak times which would otherwise be idle, thus making more efficient use of vehicles and manpower. However, on routes where the level of passenger travel is low, provision of special bus services may detract from an already meagre demand for ordinary bus services, making these less viable. This system also has the disadvantages of relegating those qualifying for concessions to off-peak travel times only, and of segregating them from other passengers.

The system currently operated by the East Kent Road Car Company entitles old age pensioners in Broadstairs to purchase a bus pass for 50p which allows a reduction of 2 pence from the fare for every journey. For longer journeys, a pass for £1 allows unlimited travel for one day. Until recently a similar system applied in Whitstable. However, under the current arrangement a pass costing £2 allows a concession of 5p from fares of up to 23 pence, and another for £4 allows passengers paying more than 24 pence to travel for half fare.

The bus company is faced with grave financial difficulties and in view of these, the company has been forced to make fare increases in recent years. Announcing a new round of fare increases in 1977, the company reported that although it received a revenue support grant of £235,000, this was to support unprofitable services, rather than to keep down fares (Kentish Gazette, 10/11/77). Claims for cheaper public transport for one section of the population, such as the elderly, must also be set against competing needs of other groups who qualify for concessions, for example, the high fares paid by school children has also been a controversial problem in East Kent.

Thus government policy for public transport is based on the principle that access to all facilities, not only those for health care, should be 'reasonable' for all members of society , and should not be denied to those who do not have private transport at their disposal. However, in view of the financial constraints upon operators and the lack of any national standards for subsidies and concessions, such a policy may be difficult to implement and it is important that available resources are spent on those who need them most. The evidence reported in this thesis demonstrated the characteristics of those elderly people whose lack of spatial mobility is particularly limiting and who therefore represent a group with greatest need for concessionary fares.

Voluntary transport schemes as means for improving the mobility of the elderly

The possibilities and problems of voluntary transport for the elderly are discussed by Norman (1977, Chapter 6) who describes various schemes. These were operated using minibuses, owned by voluntary organizations, or private cars. Cars may be used in non-organized lift giving, in locally organized car pools, or through local bodies recruiting drivers to meet social needs, and by social car services more formally organized for specific categories of passenger with support from the NHS or local authority.

In Broadstairs and Whitstable, local voluntary organizations are active in organizing car transport for elderly people. For example, in Whitstable, a system is operated to provide transport to the hospital in Canterbury for those needing treatment, or to visit inpatients. Evidence will be presented in chapter 8 to show that some local people were very active in providing lifts on an informal individual basis to their friends and neighbours in both towns. Whitstable Age Concern also operates one minibus and is bringing another into operation, and a minibus service is also being set up in Broadstairs to operate from the old people's day centre in that town.

The problems associated with running such services include difficulties of recruiting and organizing voluntary drivers and, in the case of minibuses particularly, of meeting the costs of providing the vehicle and operating it. Also, licensing may present a problem. A recent bill was designed to clarify the position of minibus operators and relax restrictions on the operations of such services. Local authority attitudes to such voluntary schemes are also variable, and not always supportive. For example, in Whitstable, while not opposing the minibus scheme, the authority had turned down requests for financial assistance by the voluntary body operating the service. Services likely to compete with normal bus services are not normally permitted.

Another difficulty most pertinent to the discussion in this thesis, is

the question of who should benefit from voluntary services, when the organizers are faced with the problem of having resources too limited to meet the demand for voluntary transport. The results obtained from this study will be seen to provide some indications of the types of elderly individuals for whom voluntary transport is most needed and most likely to be effective in improving spatial access to primary health care.

THE BASIS FOR A STUDY OF ACCESS TO HEALTH SERVICES

The preceding sections have raised a number of issues relating to the study of the accessibility of National Health Services. To conclude this chapter, these points are summarized and some of the assumptions incorporated in the discussion will be highlighted.

It was shown that the National Health Service system is a public service organization established to provide comprehensive health care available to all members of the population in proportion to need. Health services may be considered to be impure public goods; while health care is consumed unequally by individuals, equity in the availability of health services is an explicit objective of the NHS. The requirement for equity arises from the aim to provide a fully comprehensive service, and the criterion on which equity may be assessed is medical need.

The structure of the NHS organization was considered and it was shown that the structure (particularly since the 1974 reorganization) implies an important spatial element in the system of health care provision. The concept incorporated in the present organization of catchment areas of different sizes for different orders of services was given special attention, since the assumption of this spatial dimension of health care provision is also an important one for this thesis.

If the importance of equity and of the spatial element in the operation of the health service is accepted, then territorial justice must be one of

the major objectives to be considered in planning health service provision. The significance of territorial justice was discussed in Chapter 1, where it was shown to be related to the concept of individual equity adopted here. Of particular interest is the question of how to assess territorial justice. The methods of measurement currently used to allocate resources in a way likely to promote territorial justice were discussed. These methods are founded on two assumptions; first that resource allocation should be based on relative need rather than on other factors, such as the previous patterns of distribution, and second that the allocation procedure should be aimed at reducing existing inequalities; so that, failing a health finance miracle of the loaves and fishes variety, the limited funds for health care should be distributed in such a way as to benefit less fortunate areas at the expense of those regions which were previously better endowed with health care. It is, therefore, important to be able to evaluate the needs of different areas accurately and in such a way as to make possible comparisons between areas to establish relative need. Population based needs indicators have, therefore, been introduced to calculate how to share out the available resources in proportion to predictions of the health care requirements of the populations of different regions. In the case of general practitioners, attempts are made at directing the distribution of manpower using less sophisticated indicators based on practice sizes.

An assumption which has been implicit in the RAWP system of resource allocation is that the provision of resources to meet health needs will ensure the production of services which are actually made more readily available to the population in need. This is an assumption which is questioned by public administrators themselves in the Ninth Report of the Expenditure Committee quoted above, and will be the main focus of research in this thesis. A basic tenet of this study is that in order to achieve more effective and equitable health service provision by increased resource

allocation at the local level, spatial accessibility of the services must also be ensured. An issue for consideration in the following chapters is that of whether analyses of the costs of providing care should include a consideration of the costs of making care spatially accessible to patients. This would involve assessing whether spatial access costs reduce availability of care for clients in a way which is inequitable. If the costs of spatial access are inequitable, then public resources should be allocated through the public service system in order to reduce these inequalities. In the latter case, it would be necessary to be able to assess what are the significant costs of spatial access to health care, which groups need to have the burden of these costs allieviated and what would be the best form of intervention. To make such assessments would require a better understanding of the factors effecting access costs and the way in which these costs influence behaviour. The research reported here addressed these questions by means of a case study of spatial accessibility to primary health facilities for the elderly in parts of East Kent.

CHAPTER 3

ASSOCIATIONS BETWEEN USE OF HEALTH SERVICES AND THEIR SPATIAL ACCESSIBILITY FOR CONSUMERS

The preceding chapters have presented the view of health care as a type of impure public good which should be made available through the National Health Service for all individuals in proportion to medical need. It has also been argued that one of the factors likely to affect the availability of health care to individuals is the spatial accessibility of facilities providing health services. This chapter considers the evidence relating to this argument.

Clearly if spatial accessibility affects availability to the extent that consumption of health care is affected, then variation in spatial access would be recognized to be likely to be detrimental to a just distribution of health care. The results obtained from research by other authors concerning the relationship between spatial accessibility of facilities and use of health services is therefore considered in this chapter to discover to what extent these two factors can be observed to be associated, and what is the relative importance of spatial access compared with other factors influencing the consumption of health care. The discussion will also draw upon the findings of the Geographical literature on human activity in space to suggest some of the reasons why spatial access is likely to affect individuals' behaviour in obtaining services and what aspects of accessibility are most important in this respect. Consideration is given first to the range of variables which have been found to be linked to the use made of health services, and the models proposed to explain these relationships.

HEALTH SERVICE UTILIZATION MODELS

The study of the factors determining patterns of use of health

services has occupied researchers in several countries with different types of health service systems. The issue has been given particular attention in the USA following the enactment of the Hill-Burton legislation (Hospital Survey and Construction Act) in 1946 to encourage the supply of adequate medical facilities for the entire population (Shannon and Dever, 1974, p.96), and there are numerous instances in the American literature of construction of models describing the interrelationships of factors affecting use. Considerable research has also been carried out in Britain on the subject, although attempts at explaining the relationships between relevant factors have been less sophisticated in general. Data is also available for other countries including parts of Scandinavia and Australia.

These studies provided material which was relevant to the issue of access to primary health care in East Kent and was therefore of particular interest to this thesis. However, differences in the subject matter of the studies imposed some limitations on the applicability of this material to the questions addressed here. For example, it was difficult to determine to what extent cross-national differences might affect the relationships described. One of the most obvious differences which was anticipated was in the degree to which economic factors affect access to health care, since in countries such as the USA health care is mainly provided privately by a system of insurance schemes, in contrast to the publicly provided National Health Service in this country. A further problem was that much of the empirical evidence is specific to particular types of health service and it was possible that findings with respect to one type of health care might not be completely valid in the context of another. It was also possible that the factors affecting use of health care may have changed somewhat through time during the last three decades which have seen the development of this area of research. The literature reviewed here was, therefore, considered to be significant to this discussion by virtue of the general findings rather than detailed results.

Several different disciplines have been involved in the study of use of health services, and, as was mentioned in Chapter 1, each has tended to place emphasis on rather different aspects of the problem of utilization of health services. Authors such as McKinlay (1972) and Aday (1972) have produced comprehensive reviews of the work which has been carried out in this field. McKinlay divided the very prolific literature on this subject into six'approaches' to the research, each representing studies which have tended to concentrate on specific groups of factors thought to affect health service use, and which he classified as economic, socio-demographic, geographical, socio-psychological, socio-cultural and organizational. McKinlay himself stated that the classification was somewhat arbitrary and in fact many of the studies included material which might qualify them for inclusion in more than one category. However, the organization of this review was interesting since it gave an impression of the very broad range of factors likely to be relevant to the question of health care utilization. McKinlay also commented that the findings from the empirical work have been rather insubstantial in relation to the volume of the literature and have tended to be inconsistent without much attempt to account for the disparities. In Great Britain, in particular, there has also been a lack of sound theoretical work on utilization behaviour, (McKinlay, 1972, p.115).

Much of the research on health service use has been restricted to a study of association between specific characteristics of clients or services and the use made of health care, without much elaboration of any theoretical framework of how or why these characteristics influence use or affect each other. Rather than attempting to review these studies, which have only indirect relevance to this research, consideration is given to selected work in which authors have attempted to draw together the various factors which seem to influence use of health care into theoretical models which hypothesize relationships between these determining factors, or processes by which the use of health care is determined.

The models discussed here are among those most often quoted in the literature and have formed the basis for several empirical studies. Other authors attempting to review the development of general theoretical models include Veeder (1975) who used particular models to illustrate what she saw as an increasing complexity and sophistication in the models and the techniques used to test them. She traced a development from a psychological model of client motivations to a model incorporating socio-environmental determinants, followed by a model incorporating a range of factors related to the family life cycle, and finally culminating in a behavioural model with an even broader range of variables. Stacey (1977) considered the contributions of sociology to the more general problem of the operation of health care systems, and recognized five major theoretical approaches; the structural-functional, emphasising the importance of health and its treatment for the social system; the psychological, stressing illness behaviour; the structuralist, concentrating especially on the sociology of medical professionalism; a Marxist approach, postulating that certain classes in society exploit others through the health care system, and an approach focused on social administration which is distinctively British.

There are, therefore, various possible ways of grouping theoretical models of service use. It has seemed appropriate here to consider the literature by dividing the models into three categories:

First, individual determinants of use stressing particular psychological aspects of individual clients and their behaviour in obtaining health care;

Second, those models which are addressed to the problem of use of health care by particular groups in society and the ways in which relationships between social groups effect utilization;

Third, a mixed category of two more comprehensive models which might be applied to either individuals or groups, and which incorporate elements drawn from models in both of the first two categories.

Individual Aspects of Health Service Use

Models postulated by Rosenstock and Mechanic exemplify the psychological-motivational type of approach which seeks to explain health service use from the point of view of the individual's perception and motivations.

Rosenstock adapted the ideas of Lewin (1952) which represent motivation as a tension within the force field of the human mental environment. Rosenstock (1966) postulated a model in which the probability that an individual would use a given health service was controlled first by his readiness to take action, determined by his perception of his own susceptibility to an illness and the likelihood that the illness will be serious, second by the extent to which he believes that seeking health care will be beneficial, which is governed by the psychological forces of his mental field, including barriers to action. The action also required a cue or trigger before it would take place. One of the attractions of the model as Rosenstock saw it, was that the perceptions involved were capable of change through education, which stressed the importance of the learning process in health behaviour.

Empirical evidence is available from several studies using this approach. For example, Hienzelmann (1962) applied Rosenstock's earlier model to a study of the behaviour of individuals in obtaining preventative treatment for rheumatic fever. He analysed the importance of the respondents' beliefs about the disease and personal susceptibility to it, medical factors relating to medical need for treatment, a range of sociological variables and the amount of contact with the physician. Hienzelmann found that the patient's subjective definition of his state of health, resulting from his perceptions about illness and medical care, controlled his actions in obtaining preventative care.

Glasser's study (1958) of acceptance of a vaccination programme by the public showed that past behaviour was one of the factors governing

people's attitudes. Those already vaccinated were most likely to require further vaccinations. Also, in a study of socio-psychological factors affecting use of dental care, Kegeles (1963) showed that perceptions of susceptibility to dental decay was a more significant factor than perceived seriousness of likely dental problems.

The general impression gained from these studies was that individuals' perceptions of their health status, particularly susceptibility to disease, rather than the likely severity of the illness, are significant factors in seeking health care (Veeder, 1975). The model seemed to be particularly useful in the study of patients' behaviour in obtaining preventative medical attention.

Mechanic (1978) has also formulated a model which places stress on the individual's perception of his symptoms and the ways in which he reacts to signs of illness. The model incorporates ten determinants of the individual's behaviour when ill. These may be summarized as factors relating to the visibility and recognizability of symptoms; the extent to which symptoms are recognized to be serious and likely to be disruptive; the frequency with which symptoms occur; the tolerance of those evaluating the symptoms to signs of illness and their knowledge of, and attitude to, illness and medical care; the existence of other needs competing with need for health care and the availability of health care in terms of physical proximity of services and psychological and monetary costs of obtaining health care. Illness behaviour was therefore viewed primarily in terms of the individual's recognition of his illness and his perception of the danger associated with the illness.

Evidence for variations in the perception of illness has been found in several studies including those conducted in the United States by Mechanic and Volkart (1961) and Koos (1954). Reasons for this variation have been sought in analyses of the decision-making process undergone by

an individual when he decides to consult a doctor, for example by Stoeckle et al (1963). In a British study, Banks et al (1975) found that amongst women, those with a high level of anxiety are more likely to perceive symptoms of illness and are more likely to consult their doctor. This observation was interpreted in terms of the model of individual illness perception and behaviour suggested by Mechanic.

The Variation in Use of Health Services Between Social Groups

The second type of model considered here consists of those which place emphasis on the differences in use of medical care by various social groups, and on the external influences affecting individual utilization patterns, rather than the internal motivations of the individual. Evidence for variation in use of health care between different types of clients is well documented in the British literature. For example, Cartwright (1967) has found that age, sex, and social class of patients may affect the consultation rate in general practice. Groups found to be relatively high users are infants, women of child-bearing age and older people. These findings have been supported in general by other large scale surveys such as the General Household Survey (OPCS, 1976; 1977), and the study of Morbidity Statistics from General Practice (OPCS, 1974). These surveys have also revealed considerable variations in consultation rates between different areas of the country.

Variation in consultation rates have also been analysed in surveys confined to more localized areas, for example, in Exeter, where 70,000 patients were surveyed by Ashford and Pearson (1970). In their review of the findings of the British literature on the use of health services, Banks et al. (1975) drew attention to studies suggesting that consultation rates may vary with marital status, family size, levels of health education, as well as age and sex.

In spite of a considerable body of empirical evidence for these

variations, there has been little attempt to postulate explanations for patterns of use of health care in Britain. For theoretical interpretations of these results it is necessary to turn to the American literature. One model representing an example of this type is that postulated by Suchman in a series of articles (eg. Suchman, 1964,1965). The hypotheses of the model were that socio-economic classes have varying social structures, lower social classes and minority groups being more parochial and isolated from the norms of society than upper classes and larger ethnic groups. The less integrated, more inward looking social groups also have more 'popular' attitudes to medicine than cosmopolitan groups whose attitudes to medicine are more scientific. Those with the cosmopolitan-scientific outlook make more use of modern health care services than the parochial social groups who find it more difficult to accept highly organized and formal medical care. Thus it was postulated use of health care is not only governed by factors of ill-health, demography and income which distinguish ethnic minorities, but also by what Suchman termed 'medical orientation' of the social groups in question.

In a series of studies of use of health care facilities in New York, Suchman (1964,1965) found evidence to support this hypothesis that isolated ethnocentric social groups consisting of ethnic minorities had poorer knowledge about disease, were more sceptical of modern medical care and depended to a greater extent on lay support in illness than did more cosmopolitan groups with more scientific attitudes to medical care.

Friedson (1960) approached the question of utilization rates by different social groups in a rather different way. He argued that the physician was separated from the community he serves by virtue of his status as a professional. For patients to make use of his expertise, the doctor depended upon the decision making of his clients, influenced by a system of 'lay referral' operating in the community. In some social groups

(especially lower classes with attitudes to medical care which differ most from those of the doctor) the lay referral system may operate according to different principles than those of the'professional referral' system offered by the medical profession, so that use of medical care might not correspond to the norms favoured by the doctor. Friedson suggested that clients are more likely to be directed by the lay referral system within their community to 'independent' medical practices,quack physicians and general village or neighbourhood practices, than to a 'dependent' practice in a clinic or hospital which is likely to be spatially and culturally farthest removed from the potential client's community.

Thus according to Friedson's model, the use of medical care varies according to the way in which medical practice is organized and the degree to which it is divorced from the community in which the sick person lives. Friedson has found evidence to support this model in a study of alternative ways of introducing new medical services to communities. He found that,

> "...new services seem to be most easily introduced by being inserted into a culturally and structurally appropriate position within an already existing lay referral system.
>
> (Friedson, 1960,p.116)

The role of the doctor in influencing clients' use of medical services has also been stressed in the British literature. For example, Cartwright found that variation in rates of consultation with the family doctor cannot be explained fully in terms of the characteristics and attitudes of patients, and concludes that "doctors can exert a lot of influence on the number and nature of their patient's consultations" (Cartwright, 1967, p.31-33). Dowie's recent research on the organization of the work of British doctors in the referral of patients has provided some data on the ways in which the professional status and outlook of the doctor affects the usefulness of his services to the patients, and analysing the repercussions on the use made of GP's services, (Dowie 1979, p.9).

Two More Comprehensive Models of Health Service Use

Finally, two models are considered which have attempted to provide a more comprehensive account of the factors influencing use of health care, combining both individual and group influences. The first model, postulated by Anderson (1968) used the concept of the family life cycle and attempted to predict family use of health services on the basis of predisposing, enabling and need factors.

Predisposing factors include demographic characteristics of family composition, social characteristics of the family such as social class, occupation education, race and ethnicity, and beliefs held about medical care and disease. Enabling factors consist of family attributes such as income, insurance, types of care received and community resources, supply of doctors, hospital beds and regional variations. Need factors relate to health status and symptoms and effects of illness and responses to illness.

Anderson (1964) was able to account for only 43% of variation in use of health care using this model. However, he found that the need variables were most powerful explanatory factors. He suggested that the model should take into account differences in use of different types of health care.

Gross (1972) postulated a similar 'behavioural' model of health service utilization in which use of health care was related to the following groups of factors;

1) Enabling factors - income, health insurance, family size, occupation, sex and education of the family head;

2) Predisposing factors - attitudes to health care, and health services, health values, health behaviour, reaction to symptoms of ill health, use of regular source of care, knowledge of services available;

3) Accessibility factors - distance and/or time of individual from facility, appointment delay time, waiting times, availability of services at varying distances from the household, availability of a regular source of care;

4) Perceived health status;

5) Exogenous factors affecting either the individual or the general population of the area in which he lives (age, sex, family size, race, education, location).

It may be concluded from this review of three types of model of health service utilization that the phenomenon is the result of a very broad and complex range of factors, making the problems amenable to a variety of conceptual approaches and disciplinary frameworks. It has not been shown conclusively that one model is superior to another overall, although the models formulated by Anderson and Gross are broader in scope and the range of factors included, and are therefore likely to be most useful as general models. However, this account has shown that certain factors appear to recur in most of the literature as significant variables influencing use of health care. These are income, health status, attitudes to professional medicine and the accessibility of health services, including social and spatial access. The main differences between the models result from varying interpretations of the relative importance of individual variation in perception of one's own health and costs of obtaining health care, as opposed to variation between social groups in the need for health care and the accessibility of health services.

Factors relating to use are both 'objective' and 'subjective' in character. The 'objective' variables are amenable to measurement for all individuals on the basis of a consistent, generally agreed standard, without recourse to a study of the individual's perceptions. These include demographic factors, health status variables, financial constraints, and accessibility factors of time, cost and distance. More subjective factors influencing use of health services must be gauged by an assessment of the perceptions of individuals or social groups, and they may contribute towards a better understanding of the significance of the objectively measured factors. Subjective factors which have been frequently incorporated in the models discussed above are health education and beliefs about health, medicine and the availability of services, social influences exercised by the community, and the relationship between doctors and their patients.

The importance of these subjective and objective factors and the reasons for their influence over service use may vary for different types of service and for different clients.

The accessibility of services, including spatial access has been a recurrent factor in most models of use of health services. However, while access is generally agreed to be a factor relevant to utilization patterns, it has been identified as one of a number of characteristics governing the use made of health care by individuals and groups of patients. Therefore variation in utilization rates would not be expected to manifest a strong direct association with spatial accessibility of health care unless other factors were taken into account in the analysis. It was therefore postulated that a study of spatial accessibility which sought to establish how this factor related to other variables such as economic status, demography, health condition and perceptions of the availability of health care was most likely to reveal the full significance of spatial access to health facilities.

THEORIES OF HUMAN BEHAVIOUR IN SPACE

The models discussed in the preceding section postulated that spatial accessibility of health care is one of the factors which influence the real 'cost' to clients of obtaining health care and the behaviour of individuals in using health services. This hypothesis begged the question of why spatial accessibility should have such an effect, and led to a consideration of explanations which may be proposed to account for the influence of space on human behaviour and perceptions. Since patterns of human activity in space are of fundamental concern to geographical thought, this discipline provided the best source of explanatory models, and some of these will be reviewed here. Three concepts of particular value to this study are those of the friction of distance and distance decay, individual and group aspects of perception of space, and the idea of the action space.

Some of the most influential early models of human activity in space were postulated by Von Thunen (described in Carter, 1972, p.70), Christaller (1965,1966) and Losch (1954). Von Thunen's hypothesis related to the distribution of agricultural land use around centres of population and was based on rent theory. Central Place Theory, as developed by Christaller and Losch sought to explain the distribution of human settlements in terms of the size of the settlements, the number of different economic functions they performed, and the varying range of different goods and services (that is, the distance over which consumers were prepared to travel to obtain them). Central Place Theory postulated a regular pattern in the spatial distribution of settlements and economic activity with each centre arranged according to its position in a hierarchy of urban places ranked on the basis of their service functions. These twin concepts of, on the one hand, a hierarchical ordering of urban functions, and on the other of higher order functions exerting more extensive spheres of influence in space than lower order functions, were based on an idealized view of society involving man acting as the fully knowledgable and rational Homo economicus, living in the featureless world of the isotropic plain and engaging in economic activities displaying perfect competition, (Webber, 1964).

Friction of distance and distance decay

In spite of the very abstract terms of Central Place Theory, it stimulated much theoretical discussion and generated a considerable literature reporting empirical research on the subject and resulting in further efforts at modelling human activity in space. One of these models was the 'gravity model' of human interaction. This was developed by Dodd (1950) and Zipf (1946, a & b) as an 'interactance hypothesis' that the rate of interaction and communication between two groups of people in separate locations would be directly proportional to the number of people in each

group and inversely proportional to the distance separating the two communities. The gravity model interprets the interaction relationship as being analagous to the equation for gravitational attraction between two bodies, and Reilly used the relationship to predict the areas from which retailers will draw their custom (Chorley and Haggett, p.559, Carter, 1972, p.127). Huff, (1963) translated the gravity model into a probabilistic expression calculating the probability that a consumer from a particular residential location will use a given shopping centre. The calculation is made on the basis of the size of the shopping facility and the travel time required for the consumer to reach it.

The studies reported in the previous section provide evidence for the friction of distance and resultant distance decay in use of health care facilities, and similar effects have been observed with respect to other human activity, for example in research by Zipf (1946) on newspaper reporting.

In America, Getis (1969) demonstrated that distance decay in the frequency of journeys to work was not a constant function of distance. This study showed that a 'frictionless zone' existed round employment centres, extending to a threshold radius beyond which the number of employees declined as the distance from the centre increased, as shown in Figure 3a.

Thus when the behaviour of groups of individuals is considered in aggregate it is possible to discern patterns of distance decay in the spatial activities of the group as a whole. Berry has suggested that if there are regularities of this kind to be found in human behaviour in space, then it may be possible to define regions in terms of the interactions taking place between different locations at any one time (Berry and Marble, 1968, Ch.2). For example, if patients are sensitive to the friction of distance to a degree which affects their preferences for use of health facilities, then, as suggested in Chapter 2, it might be

appropriate to define planning and administrative regions for health services so that they reflect the functional regions delineated by the distance which patients on average are prepared to travel to obtain health services.

The suggestion that spatial separation might exert a systematic effect on human activities has some political connotations which have been taken up in the geographical literature. Cox and Reynolds (1974) have proposed a model of the political system in a locational context shown in Figure 3b. Some of the issues have already been raised here in preceding chapters in relation to the availability of public goods and services. Tiebout has suggested that,

> "The consumer-voter moves to the community that satisfies his preference pattern....moving or failing to move replaces the usual market test of willingness to buy a good and reveals the consumer-voter's demand for public goods."
>
> (Tiebout,1956,p.418,p.420)

However, Tiebout himself made the point that this view is valid only in the hypothetical situation where consumers have full knowledge of a large choice of alternative locations to which they are able to move. The discussion in Chapter 1 showed that such an ideal situation does not exist in reality. Some members of society have greater mobility than others and as Williams commented;

> "...those with more resources generally speaking, are more likely to achieve preferred location than those with fewer."
>
> (Williams, 1971,p.31)

Fuller (1971) suggested that in the modern world the freedom of choice in adapting to circumstances is being progressively reduced and that spatial distribution is an important element in determining freedom of choice. Furthermore, it is the least privileged groups for whom choice is most severely curtailed. Modern technology has made faster and longer journeys possible, but it has also tended to make these travel patterns <u>necessary</u>

in order to carry out our daily lives and more costly especially in the current situation of energy shortages. Those who are least able to afford the costs of travel, or are for some other reason unable to make the longer journeys now necessary for daily activities, will find their range of possible activities most restricted. Since the distribution of resources and the costs of travel to them may affect the range of opportunity open to members of society to use them, the locational issue is significant to political discussion and in the planning of resource allocation.

> "Political systems....are also spatial systems....Individuals and populations of individuals constituting the political system all have geographical locations relative to each other and to the environment of public resources applicable to public ends. These geographical locations are of critical significance for the preferences expressed for public goods, for the allocation conflicts engendered, for the mechanisms of conflict resolution selected, and for the allocation of public goods ultimately arrived at."
>
> (Cox and Reynolds, 1974,p.29)

However, as Harvey has pointed out,it is difficult in practice to operate a process of allocation which takes account of the effects of spatial access on opportunity when in reality, the opportunities offered by any particular distribution of resources are viewed subjectively in a different way by various members of the community.

> "What happens when groups do not perceive the same alternative choices or potential outcomes? In this case each group has its own perceived action space and conflict may arise because neither can see or understand the action space as perceived by the other."
>
> (Harvey, 1971b, p.288-289)

The perception of distance and the action space

This problem of differing interpretations of the access opportunities afforded by the environment is one reason why geographers have attempted to delve deeper into the question of human activities in space, looking beyond the patterns observable at the aggregate level to the perceptions and behaviour of individuals. This approach has been termed the 'behavioural' or 'perceptual' approach in geography and Soja has also suggested that a

a study of behaviour provides a link between studies of aggregate patterns of spatial activity and the definition of regions and areas. (Soja, 1969,p.6).

The geographical study of perception of the environment is mainly concerned with perception as conscious awareness (Goodey,1971,p14;Pocock,1974, p.1; Kates, 1970,p.648) and the functional environment of the individual, that is the portion of the environment most pertinent to the person or people being investigated. Sonnenfeld (see Saarinen 1969)has postulated that this corresponds to the perceptual and behavioural environments: that part of the broader geographical environment of which man is aware and that part which is actually involved in human behaviour. In this respect the approach differs from work by perceptual psychologists which has concentrated mainly on perception of 'visible' space, the area which is visible to an observer from his position of observation (eg. Hochberg, 1964; Forgus, 1966; Gibson, 1950). Similarly, the work by Hall (1969) on proxemics is more concerned with the way in which man perceives the spaces immediately around him.

Work by Eliot Hurst (1972) exemplified the behavioural approach in geography. He considered the approach to be capable of producing more realistic models explaining human activity in space than have been provided by the paradigms of determinism or possibilism previously employed by the discipline. Eliot Hurst argues that the individual's perception of his environment, and his response to it, is coloured by the 'operational mileu' which is analagous to a filter interposed between the individual and 'objective reality'.

Lowenthal (1961) outlined some of the characteristics of the view of the world which is held by people in general and explains how this shared view differs from the private world of the individual. Group perceptions represent general agreement about the character of the world and the way it is ordered, corresponding to the view of sane healthy adults. This view changes in response to growing knowledge but tends to lag somewhat

behind the expansion of knowledge, partly because of our tendency to cherish past perceptions. The shared world view is a partial picture of the world centred on man. Individual perceptions of the world are partly related to the shared view, but are unique, more complex, more localized and temporally restricted. Factors which contribute towards the idiosyncratic quality of individual perceptions of the environment are past experience, feelings and emotions and cultural and linguistic variations.

Boulding (1956, p.47) called this private view the 'image' of the individual. The image may be considered as having a number of dimensions including a spatial image of 'the picture of the individual's location in the space around him'. The image depends not only on 'fact' but on the value system of the individual.

> "The subjective knowledge structure or image of any individual or organization consists not only of images of 'fact' but also image of 'value'...The image of value is concerned with the rating of the various parts of our image of the world according to some scale of betterness or worseness."
>
> (Boulding, 1956, p.11)

The findings from geographical research into perception of (and behaviour in) space may be summarized in categories according to the aspect of perceived space with which they are concerned (Wood, 1970). Some of the work most relevant to this study is that related to perception of landscape, spatial preferences and movement in space.

Work on perception of the landscape (eg. by Lynch, 1960: Gould and White 1974; Stea 1969) has identified the visual elements of the landscape which are used by individuals as perceptual cues to recognition and comprehension of the urban environment. This literature suggested that individuals understand their spatial environment in terms of nodal points and landmarks, their relative position and the distances between them, the paths linking them and barriers between them. Other elements are entire areas recognized as bounded districts. Some studies have also

been directed at the problem of how individuals estimate distances. Lowrey(1973) compared groups of different sex and drivers and non-drivers and discovered that their ability to estimate distances accurately showed some intergroup variation. Briggs (1973) found that accuracy in estimating distances decreases as distance increases. He suggested that perception of distance is related to city structure. Briggs also found that subjects tended to perceive road distances 'as the crow flies', in terms of straightline distance.

Studies of spatial preferences have been concerned with attempts to apply relationships similar to the economists' concept of the utility function, or preference functions from market research methods, to patterns of choice of facility location. Rushton (1969) has experimented with the analysis of revealed space preferences. This technique involved the collection of data derived from responses to paired choices of alternative spatial locations for provision of the commodity in question. Rushton produced rankings of the locational alternatives and this ranking was graphically expressed as an indifference surface representing the trade-off between the size of a facility location and the distance to it. Golledge et al. (1966) were able to show that individuals displayed different preference functions for different types of goods and services. This was relevant to the concept of the range of a good introduced above, and suggested a possible explanation for the fact that individuals travel further for some facilities than for others. The pattern of spatial preferences may also vary according to social and cultural factors and mobility (eg. Murdie, 1965).

An important concept in studying the perception and behaviour of individuals in space is that of the action space, illustrated in Figure 3c. The important components of the action space are the movement and communication involved in the everyday life of the individual. Although some individuals regularly travel extensively, the typical action space is

dominated by;

1) movement within or near the individual's home;

2) movement to and from regular activity locations (eg.places of work, places of entertainment);

3) movement in and around these activity locations.

(Jackle et al, 1976, p.92)

Some work has been devoted to a study of how the action space develops, applying theories of learning (eg. Horton and Reynolds, 1969; Harrison and Sarre, 1971; Briggs, 1973). Golledge and Zanaras (1973) have cited evidence suggesting that some parts of the action space such as the journey to work are quickly learned and become quite stable and predictable. Other activities such as shopping behaviour are more variable in space and display a 'funnelling' effect with individuals located further from facilities taking longer to establish a regular pattern of activity and being more likely to make use of more than one alternative facility site, while those close to facilities are more likely to quickly develop a tendency to use only one facility location.

Studies of movement in space include some already discussed in connection with action spaces. Some research has also been directed towards analysing the factors which cause people to change their action space. Examples of this work are Wolpert's study on the decision to migrate (Wolpert, 1965), and Chapin's proposal for a decision making model for families moving house,(Chapin, 1968). Chapin suggested that the factors controlling the choice of a new residential location were partly determined by the regular choices which contribute to the pattern of the daily routine. Factors which were considered when making these choices include social factors such as security, achievement and status, accessibility factors of time and distance to activity locations from the place of residence, and requirements resulting from the stage which had been reached in the family life cycle.

This discussion of the Geographical literature on human behaviour in space has presented certain conclusions which are relevant to the question of why the use which people make of health facilities may vary according to the physical accessibility of the facility locations. First, human behaviour in the aggregate seems to show some regularities in its spatial arrangement. In general, the further the individual must travel to make use of a given facility or amenity, the greater is the cost of using it and the more likely it is that either a substitute will be found to the service provided at the facility, or that the service will not be obtained at all.

This distance decay effect is modified, however, by the fact that larger facility centres offering a greater range of opportunity are more attractive than smaller ones, and that individuals are prepared to travel further to obtain certain goods and services than for others. Thus for example, one might expect that, given the choice, patients might travel further to a health centre where there is a greater range of services available, than to a small doctor's surgery, where the facilities are fewer although the small surgery may be closer. Also, patients might be prepared to travel further for health care in cases of acute illness requiring specialised health services on an occasional basis than for care for more minor illness or chronic conditions requiring frequent attention.

Individuals, therefore, differ in the degree to which distance imposes a frictional effect on their activities. This variation is due to variations in the physical constraints on their mobility and in the ways in which they perceive the accessibility of opportunities in space. The spatial perceptions of the individual are governed by a range of social, economic and psychological characteristics and are closely related to the action space in which everyday life is carried out.

EVIDENCE FOR THE INFLUENCE OF SPATIAL ACCESS ON USE OF HEALTH SERVICES

Theories from the literature on use of health services, and on spatial behaviour have, therefore, hypothesised an association between spatial accessibility of facilities and use of these facilities. The following paragraphs review the evidence for this relationship provided by empirical studies. Before considering these, however, it is necessary to elucidate the definition of spatial accessibility which is implied by the theory of spatial behaviour, and to discuss how accessibility may be measured for empirical purposes.

One interpretation of the concept of spatial accessibility has been proposed as follows:

> "Accessibility is a function of two clear and distinct factors; spatial location of people relative to activities (destinations) and mobility available to people to reach these activities"
>
> (Mitchell & Town, 1976,p.29)

The degree of spatial access to health care services enjoyed by an individual or a group of people may be thought of as the extent to which their location in space, (generally residential location) in relation to the location of health care facilities, makes these facilities available to them in view of their level of mobility. Barriers due to spatial access to health care result from the costs of overcoming the limitations on availability of health care which are imposed by a given level of spatial access. These costs may be of money, time or physical or mental effort, and as the discussion above has shown, barriers which appear in objective terms to be similar for everyone may loom larger in the mental image of some people than of others, and may, therefore, have varying effects on use of health facilities.

Measures of spatial accessibility should therefore try to take into account factors of relative location and mobility. Some authors have sought to evaluate these in terms of distance functions and mode of travel.

In some cases, distance measures alone were used, while other researchers have attempted to combine location and mobility factors by using travel time to facilities as the measure of spatial access. Mitchell and Town, for example, favoured the use of travel time to the facility by the quickest mode available to the traveller. However more sophisticated measures have been suggested (Mitchell and Town, 1976,p.29; Knox, 1978, p.424-425). These are all objective access measures, and most of the studies discussed below have used some standard criterion of accessibility for all the patients assessed. However, in view of the importance of individual perception to spatial behaviour, it seems likely that subjective assessments of access might go some way towards helping to explain utilization of health facilities.

Research into the spatial distribution of health care facilities and their spatial accessibility has typically pursued one of three approaches. The first is concerned with describing the distribution of health facilities and comparing this with the spatial pattern of the service population, and is often associated with a study of the geographical patterns of health and illness. In particular, research of this type has considered how the distribution of facilities varies between areas and highlights inequalities between areas in the health service opportunities available per head of the population for a given cost of spatial access. This method, termed by Shannon et al (1969, p.143) the'area approach', has been exemplified by work on medical geography by McGlashan (1972) and Pyle (1971), by studies in Scottish cities by Knox (1978) and in Los Angeles by Wachs and Kumagai (1973). A number of other studies were reviewed by Shannon and Dever (1974, Ch.3). This approach is not particularly helpful to the present discussion, since it makes a number of assumptions including the premise that variations in spatial accessibility of health services do significantly affect their availability

(and presumably the rate of consumption of services by different groups) which is the very point at issue here. However, they are interesting in that they permit analysis of the degree to which the opportunities offered by the action space vary for client groups.

The other two groups of studies are concerned with identifying the relationship between spatial accessibility and use of health services. One of these focuses on the facility locations and their catchment areas, the other concentrates on the clientelle using the facilities and examines whether differences in the level of spatial access of services amongst patients are associated with differences in patterns of health care utilization.

Work on the catchments of medical facilities has often applied the concept of distance decay in a population's use of a facility and some studies have been based on the gravity model. For example, Morrill and Kelley (1972) used a gravity model to predict patient flows to Chicago hospitals. They found that their model simulated the real patterns of flows quite successfully in spite of the fact that other factors controlling the use of hospitals by patients, such as referral processes, were not incorporated into the simulation model. Drossness and Lubin (1966) made a study of the travel patterns of patients to hospitals in California. For ten different hospitals they consistently found a decay effect in the number of admissions as the travel time from the hospital increased. The hospitals seemed to draw most of their patients from an area within 15 minutes travelling time from the hospital.

Drossness and Lubin found that the distance decay effect was fairly consistent between services when they compared a particular speciality (obstetrics) with total admissions. However, work by Dear (1977) suggested that for certain services the effect of spatial accessibility may vary. He found, for example, that patients are very tolerant of long journeys to mental health clinics. In fact, inaccessibility may even make a psychiatric

care facility more attractive, since it helps to preserve client anonymity. Dear suggested that non-geographical characteristics of the health service facility and the client may distort the distance decay effect.

Brooks (1973) found that larger clinics in Detroit drew patients from a larger catchment area than small clinics, suggesting a relationship between size of the facility and distance decay in use. Altman (1954) made a study of distances travelled by patients to general practitioners and medical specialists in Pennsylvania, in which he found that journeys over a threshold distance of five miles declined in frequency with increasing distance. The distance decay function was found to be curvilinear in form, beyond the threshold. These results reflect a model corresponding to that proposed by Getis with a frictionless zone beyond which the cost of travel makes the centre less economic for use by consumers.

Studies of the distribution of patients of general practices in Britain have also suggested a distance decay effect (Knox, 1978, p.419-418; Cartwright, (1967, p.107) found that 47% of patients in a national survey were registered with their nearest doctor and 80% were within 15 minutes travel time of their doctor's surgery. Vaughan (1967) found that a third of the patients registered with a practice in Salford lived within a quarter of a mile of the surgery, although only one tenth of all the potential patients within this radius were registered at that practice. Evidence for a decline in patient numbers as distance from the surgery increases has also been reported by Backett (1954), Hopkins et al (1968) and Richardson et al (1975). Furthermore, Phillips (1979,p.172-174) has found that patients with low social status were most likely to attend a doctor's surgery which was either the nearest facility or was more distant but readily accessible by bus. Patients of higher social status were apparently less constrained to use the most accessible surgery, and were more likely to use large surgery facilities of the health centre

type which were nearby, but not the nearest.

Research into the effects of spatial access on utilization has also been concentratedon the patient, and a number of studies have illustrated differences in the frequency of use of health services and differing utilization behaviour between patients with varying spatial access to health facility locations. There is some disagreement between authors as to whether differing spatial access to the doctor's surgery affects use of health services, since the empirical results show considerable disparities in this respect.

Some studies have failed to find any correlation between spatial accessibility and use rates. In an international study comparing factors influencing utilization of health care in four countries, Bice and White (1969) discovered that spatial access did not affect utilization rates in England, although it was a significant factor in Yugoslavia. Wan and Soifer (1975), in a study of per capita physician visits in New York and Pennsylvania, analysed the relationship of use with a range of different patient characteristics. The Logarithm of travel time was used as a measure of spatial access, but was found to be significantly related to use for only one subgroup of the overall sample (defined on the basis of their insurance coverage). This relationship also showed a surprisingly positive relationship between travel time and use, indicating more visits from those with lower access. This result may have been due to the function used to represent spatial access; since those needing to use the doctor most frequently might be expected to be the least mobile. In a study of use of primary care centres by different socio-economic groups in California, Abernathy and Shrems (1971) also concluded that there was no association between distance travelled by patients to individual Detroit clinics and the frequency with which those patients attended.

However, in contrast, some other authors have reported evidence

that lower spatial access does depress utilization rates. This view is supported by a study by Jehlik and McNamara (1952) which showed that in Missouri, the number of physician calls per 1000 persons was higher for those living within 5 miles of their doctor than for those living more than 5 miles away. They concluded that those living further from the doctor limited calls to consultations for curative purposes and used the doctor less for preventative consultations than those living closer.

Kalimo (1969) reported on a study of factors affecting illness behaviour in Finland. It was found that one of the most important factors preventing patients from seeking physician care in the event of illness was the effect of long distances to facilities.

Salkever (1976), p.469, adopted a definition of physical access to health care as "the transportation, time and search costs incurred in obtaining care". In a study of three areas in North America he found that demand for medical examinations in one of the three areas was significantly lower for those living more than 30 minutes from their doctor. However, this relationship was not consistent for the other two study areas. Demand was significantly lower among those who had to "go through too much trouble to see a doctor" and for those without a regular source of care. It was uncertain whether these associations reflected the importance of physical access or of differing attitudes to health care.

Other similar studies have provided support for the idea that spatial accessibility may affect patterns of health service use rather than frequency. For example, Cartwright stated that;

> "There was no evidence that the time it took patients to get to their doctor's surgery was related to the total frequency with which they saw the doctor during the previous twelve months. But it has..... been shown....that the number of home visits was higher for the small group of people living 30 minutes or more travelling time from the doctor's surgery."
>
> (Cartwright,1967,p.107)

Hopkins et al (1968) found that patients living between three quarters of a mile and two miles of the surgery tend to send for the doctor rather than coming to the surgery more frequently than patients living within three quarters of a mile from the doctor's surgery. Also, three studies in Britain of experiments in introducing special transport schemes to bring patients from their homes to surgeries suggested that improving spatial access by this method might effectively reduce home visits and that quite a large proportion of home visits were rendered necessary by lack of adequate transport rather than medical need (Bevan et al, 1975; Smith and Seddon, 1968; Lance, 1971).

Abernathy and Shrems report that distance affected choice of primary care facility in the Californian case;

> "The most apparent observation is that the effect of distance on the decision to use a particular facility is strong even though distance may have little influence on the decision to obtain care at some facility."
>
> (Abernathy and Shrems, 1971,p.9)

Some data is also available on the relationship between spatial access and use of special clinics and hospitals. In a study carried out in East Anglia, Haynes et al (1979a, p.121, 124) have shown that in Kings Lynn and Wisbech, those in isolated rural areas with poor access to hospital and outpatient facilities use these facilities less than others with easier access.

In a study of hospital use in Sydney, Australia, Donald (1976 a) has shown that there was a significant association between indicators of hospital use in different areas and access to general hospital beds measured in terms of numbers of beds available within 20 minutes bus travel of these districts. An 'access opportunity' measure of spatial access was also used by Collver et al (1967), calculated as;

$$A = \frac{10}{d_1} + \frac{10}{d_2} + \frac{10}{d_3} \ldots + \frac{10}{d_n}$$

Where A = accessibility for patient - d_n = distance from patient's residential location to clinic

Although in this study patients showed no particular tendency to attend the closest clinic, those attending included a larger number with a high level of overall access opportunity than with low access.

The studies reviewed in this section have supported to some extent the hypothesis that patients try to minimize costs of spatial access to health care as far as possible by registering with a doctor who operates a surgery fairly close to their residential location. However, it was not clear to what extent the registration patterns represent patient's revealed preferences for surgery location or are the result of constrained choices influenced by the health service administration or by doctors themselves.

Although the evidence suggested that spatial accessibility was not always strongly associated with rates of use of health care, or with choice of health facility, it might have some effect on the ways in which people use health services. In particular greater inaccessibility might result in higher demand for home visits from general practitioners. This is an important point, since home visits are costly in terms of the doctor's time and, except in cases where they are really necessary, are an inefficient way of providing general health care by comparison with general practice at a surgery. It seemed possible, therefore, that spatial access would affect the costs of health provision or consumption although it would not necessarily have a marked effect on the rate of consumption.

CONCLUSIONS

In Chapter 1, competition for use of public resources was represented by the analogy of a race. The above discussion shows that the prediction of winners does not depend only on the view taken of the nature of the course. One must also consider the potential of the runners. From the geographical point of view, some competitors will be unfairly handicapped

by starting from different positions and carrying additional weights of physical and economic constraints upon their mobility. Some will also be so blinded by the blinkers of their limited perception of opportunities open to them in space that they may not even be able to negotiate the course.

The review of models of utilization has shown that the range of factors likely to influence use of health services is very broad. In Britain, the main factors correlated with consultation rates with GPs are demographic, but there is some additional variation which has not been satisfactorily explained, and variation in use due to differential accessibility may contribute towards this inequality. Some studies have indicated that a low level of spatial access may depress rates of consultation and use of other health facilities, although the evidence is somewhat equivocal on this point. This may be because the demand for health care is fairly inelastic with respect to the friction of distance and patients may be prepared to incur rather high spatial access costs if necessary in order to obtain health care. If this is the case then the question is raised of whether it is socially just for consumers to be subjected to varying costs of spatial access in receiving health services, particularly if, as suggested above, those faced with the highest costs of access to care are often least able to bear those costs. Chapters 5 and 6 discuss methods of analysing the variation in spatial access for service populations.

The evidence considered has suggested that factors which influence use of health care may in some cases also affect perceived and physical spatial accessibility. The discussion above has shown that 'objective' measures of spatial access may be inadequate to explain behaviour because variation in human actions are controlled at least in part by differences in subjective perceptions of access held by individuals or groups, not only by objective evaluations according to some common standards or criteria. If it were the case that client characteristics tending to

reduce the spatial accessibility of health care were also the factors which, for other reasons, tend to increase the need to use health care, then, in order to maintain an equitable pattern of availability of health care, it would be necessary to intervene to improve the circumstances of some clients with relatively high need for health care for whom the spatial access costs of obtaining health services is also higher than average. It seems likely that one such group will be the elderly, and in Chapter 4, special consideration is given to the question of access to health facilities and use of health care by the aged.

CHAPTER 4

FACTORS AFFECTING SPATIAL ACCESS TO PRIMARY HEALTH CARE FOR THE ELDERLY

The previous chapters have demonstrated that spatial accessibility is one of the factors influencing the social justice of the distribution of health service facilities, and that the significance of spatial access will vary between individuals. This chapter presents a conceptual framework within which to study the issues of spatial access, need and equity.

It has been suggested that the elderly comprise one group of clients for whom spatial access will be particularly important, since they have a generally high need for medical care and are less mobile than other members of the population. This chapter reviews the evidence supporting this argument, and also presents material which suggests that there are certain types of person within the general elderly population who are most susceptible to problems of spatial accessibility. It is proposed that these individuals would be recognized 'objectively' to be most likely to need intervention to remove barriers of spatial inaccessibility and ensure that the health care they need is available to them without restriction.

FACTORS ASSOCIATED WITH ACCESS TO HEALTH CARE.

In order to identify the attributes of elderly clients which make them most liable to difficulties of spatial inaccessibility, it is necessary to consider first the factors likely to affect accessibility of health care for the service population as a whole. The most comprehensive model provided by the literature is that proposed by Aday and Anderson (1974). This model illustrated in Figure 4a represents a framework for the study of access to health care in the broadest sense of availability

of services. It implies the wider definition of consumer satisfaction as 'perceived availability' corresponding to the view adopted in this study and includes patient perception of spatial access costs.

> "Dimensions of satisfaction that seem relevant to consider in eliciting subjective perceptions of access are satisfaction with the convenience of care, its coordination and cost, the courtesy shown by providers, information given to the patient about dealing with his illness and his judgement as to the quality of the care he received."
>
> (Aday and Anderson, 1974,p.215)

The diagram shows how numerous and complex the interrelationships are between consumer satisfactions with access and the other groups of factors involved in this conceptual framework. Aday and Anderson have distinguished two main types of factors - first, those defined in terms of outcomes from the service system, which fall into the two groups of utilization of health care and patient satisfaction with health services. Second, there are process variables involved in the process of obtaining health care, which are either 'mutable' in that they can be changed by public policy and service provision, or are 'immutable' in that they are outside the influence of public policy. Process variables include three groups of factors - health policy, characteristics of the health delivery system and characteristics of the population at risk.

The framework proposed, therefore, identifies five types of factors, shown in the diagram. One of these is consumer satisfaction,which includes perceptions of the cost of spatial access and towards which this research is principally directed. The relationship between utilization and spatial access was discussed in Chapter 3, where it was argued that while inequitable variations in the objective or subjective costs of spatial access may exist, they do not have a clearly detectable regular influence over utilization. One reason suggested for this fact is that, as indicated in Figure 4:a, the two outcome variables of use and satisfaction are both affected in different ways by similar process variables for example,

health, income and mobility. The need for a closer examination of the relationships between the process variables and consumer satisfaction and costs was recognized.

Among the process variables, health policy is indirectly related to consumer satisfactions by its effects on the characteristics of the service system and the population at risk. The health policies applied to the British health service and their effects on service provision were discussed in Chapter 2, where it was shown that variations in health service provision do not always correspond to variations in medical need in the population at risk, and the methods in use to attempt to redistribute services in accordance with population needs were described.

Relevant characteristics of the health care delivery system in the framework proposed by Aday and Anderson are those relating to resources; the volume and distribution of services, manpower and finances; and those relating to organization; factors of entry (access) to the system such as travel distance, average waiting time etc., and factors of structure (or what happens to the patient after entry to the system. The question of resource distribution and organization will be considered in more detail in Chapter 5, which addresses the problem of how to promote equity through the spatial distribution of facilities.

Characteristics of the population at risk which are significant to the study of access are given particular attention in this chapter. These are classified in Figure 4a according to the scheme proposed by Anderson, which was described in Chapter 3. This classification distinguishes between predisposing, enabling and need factors. (Anderson et al. 1975). Predisposing variables, describe the propensity of individuals to use services and also affect their satisfaction with services. These factors exist prior to the onset of illness. They include demographic factors of age, sex, marital status, family size, social structure variables

such as education, social class and occupation, ethnicity and religion, and beliefs regarding the value of health services and knowledge of disease. Enabling factors permit an individual to satisfy a felt need regarding health service use. These may relate to the individual person or family, for example, income, being registered with a general practice and having a regular source of medical care, the accessibility of services in terms of travel time, and waiting time. Enabling factors may also apply to the community. These include, for example the level of provision of health care services per capita in the region in question. Need variables are measures of illness or health status. These may be obtained from perceived assessments of illness in terms of amount of disability, symptoms experienced and self-perceived state of health. Health condition may also be measured using clinical judgements of the nature and severity of illness and interpretations of symptoms reported by the individuals themselves. Anderson et al (1974) have shown that these factors can influence utilization of health services, but, as shown in Figure 4 a they also have a bearing on patient satisfactions and perceptions about the accessibility of health services.

The inquiry in this and subsequent chapters will be primarily concerned with the links between process characteristics of patients at risk and the outcome factor of spatial accessibility of services and consumer satisfactions with spatial access. This approach is summarized as follows by Aday and Anderson;

> "Implicit in the access concept is the fact that certain categories of people have more or less 'access' to medical care than others. The characteristics of these categories which may be biological or social 'givens'such as age, sex or race among the predisposing variables or some of the community characteristics in the enabling component, serve to define these groups. The more manipulable 'beliefs' and enabling variables such as income or health insurance coverage, are characteristics that health policy seeks to change in order to affect these groups' access to care."
>
> (Aday and Anderson 1974,p.214)

It is therefore useful to modify the illustration in Figure 4 a to show the factors discussed above which are relevant to this study. Figure 4 b provides a schematic representation of the approach used and the factors about which information is required to discover how they relate to the variable of central interest; consumer satisfaction with spatial accessibility of primary care.

THE ELDERLY AS A SPECIAL NEED GROUP

The discussion to this point has referred to the service population as a whole. However, in view of the earlier discussions of social justice which established the importance of need as the criterion for resource distribution, it was considered desirable to concentrate the study on members of the population who are likely to have an inequitable level of spatial access to health care as viewed in objective terms because of their circumstances, as well as subjectively perceived inadequacies in spatial access. Such individuals are those with the following characteristics:

1) High requirements for the services provided at primary health facilities due to relatively high incidence of ill health;
2) A residential location which is inaccessible to the facility location which is used;
3) A low level of mobility which results in relatively high friction of distance.

A group which corresponds to this description particularly closely is that represented by the elderly among the population. The elderly have a relatively high incidence of illness. The information in Table 4:1 shows that compared with younger age groups, the population aged 65 years and over include a higher proportion of people with health problems and a higher proportion with chronic illnesses, which are more likely to

necessitate regular and continued medical attention from the primary care sector than are short episodes of ill-health.

Because of their relatively poor health, the elderly consult their GP more frequently than average for the population as a whole. In 1976 it was found that one third of elderly people aged 65 or more had consulted their doctor in the previous six months (Hunt, 1978,p.87). Data from the General Household Survey (OPCS 1977) shown in Table 4:2 indicate that those living in England and Wales aged 65 and over had average consultation rates which exceeded all other age groups except young children and women aged 15-44. The figures in Table 4:3 from the study of morbidity statistics from general practice (OPCS,1974) show that in the South East of England,in which the study area is situated, elderly men were more likely to consult their doctor than other groups over the age of 15 years. For men and women over 75 years, the number of consultations made was greater than for younger adults. Table 4:4 from the GHS (1977) shows that patients over the age of 65 are also more likely to consult the doctor at home than are younger people. Partly because of this more frequent demand for home visits, and because of higher consultation rates, it has been suggested that the workload for doctors is proportionately much higher for elderly people than for younger patients on the GP's list. For example, the consultation rate for a practice of 2200 containing 33% elderly people is equivalent in terms of workload to a practice of 2480 with an age distribution approximating to the national average (Karn, 1977a, p.203).

Elderly people also need to make greater use of other primary health care services than do younger people. Table 4:5 shows that the proportion of people taking prescribed medicine is considerably higher for those over the age of 65 than for younger members of the population. The elderly are most likely to require the pharmaceutical services available at a

dispensing chemist. The average rate of attendance at outpatient departments of hospitals is also relatively high for those over 65, and for women in this age group the rate of outpatient attendance is higher than for any of the younger age groups, as illustrated in Table 4:6.

The elderly also tend to be less mobile than other groups in the population. This is likely to be partly because of their deteriorating health, which makes travel more difficult, but also because transport is less readily available. Car drivers form a smaller proportion of the elderly than of other groups. Table 4:7 shows that for men over 65 the percentage who are licence holders is 31 compared with over 70% for those aged between 21 and 49. Only 4% of women over 65 hold a driving licence compared with about 30% of those age 21-49 years. The National Travel Survey (Department of Transport, 1979) showed that for people over the age of 65, journeys made on personal business (including medical purposes) were more frequently by bus than by other transport modes, and that the elderly travelled more frequently by bus for this purpose than did younger population groups (DOT, 1979, p.50-51). Elderly people also have on average a lower income than younger people in employment, and, except where fare concessions are available for old age pensioners, they are less able to afford the cost of public transport.

As explained in Chapter 2, other groups might also be selected on the basis of the criteria listed above, for example, young mothers and their children would also have high needs, although for rather different reasons. However, attention in this research has been confined to a study of the elderly, who represent an important and growing client group for health care provision, who are particularly likely to face spatial access problems. In a report for the Royal Commission on the National Health Service (published after this research was completed), physical access to doctors' surgeries was found to be satisfactory for

most survey respondents except a minority, most of whom were over 70 years of age. (Royal Commission on the NHS, 1979,p.11 para.2.30). This supports the suggestion that the elderly are a group particularly likely to experience barriers to obtaining health care due to inadequate spatial access. The following discussion is therefore concerned with how to interpret the framework outlined in Figure 4b in terms of the elderly population, and the identification of those groups among the elderly for which spatial access is most likely to be deficient.

FACTORS AFFECTING SPATIAL ACCESS TO HEALTH CARE FOR DIFFERENT GROUPS OF ELDERLY CLIENTS

This chapter reviews a selection of the literature relating to utilization of primary health care by elderly people, concentrating on the factors which relate to the spatial accessibility of health care services to older people. The aim of this review was to use the findings of the various studies on the subject in order to establish a model of the expected interrelationships between the factors which bear upon access to primary health care for the elderly. The available evidence was mainly in the form of reported associations between variables. It should be borne in mind, however, that association does not provide concrete evidence for direct causation. The true causal links are probably more complex than the relationships shown and may involve additional variables not considered here. It should also be noted that much of the material collected was in terms of comparative percentage figures. It has not been possible for many of these data to calculate the significance of the apparent associations, so these should be treated as suggestive of associations rather than definitely supportive. Nevertheless, they are of interest since in several cases they relate to large sample populations of elderly people and are therefore more likely to be significant than results from

smaller scale studies. Data from some local studies have also been included since the findings were particularly relevant to this research. It was not expected that these results would necessarily permit detailed generalization to the study population of this thesis, although the general trends seemed likely to recur in the elderly population of East Kent.

Several alternative definitions of 'the elderly' have been employed in the studies which will be referred to here. This study encompassed the widest range of commonly used interpretations, that is men and women aged 60 years or more. Other studies have variously defined their study population as Old Age Pensioners (women of 60 or over and men of 65 or over); persons over 65 years; and even persons aged 75 or more. These differences should be borne in mind in interpreting the results obtained from the studies discussed.

Social and Demographic factors

The factors to be considered correspond to those outlined in Figure 4b as 'characteristics of the population at risk', and the discussion will first turn attention to demographic and socio-economic factors, a fundamental group of characteristics which are closely interlinked. The full pattern of interrelationships between these cannot be adequately explained by this analysis, and are in any case outside the scope of the issues to be discussed here. However,it is worth considering some of the more important associations.

Longevity is more frequent among women than men, so that of the population age 65 years and over 40% are male and 60% female (Hunt, 1978, p.11). Age and sex are also related to marital status and household composition. The probability of living alone increases with age. 30% of those over the age of 65 live alone (Hunt 1978,p.5; East Sussex County Council, 1973, p.15;Worthing CHC,1977,p.23). For those aged 75 years or more the proportion is 47%. Partly because of their longer average

life span, the majority (80%) of the elderly alone are women, and of all women over 65, 40% live alone, as compared with only 16% of men (Hunt, 1978, p.5). Those who are widowed are very likely to live alone. Abrams (1978, p.8) found that about three quarters of widows aged 75 or more live in single person households. Furthermore, over one third of all those aged 65 or more live in households composed of themselves and their elderly spouse only (Hunt, 1978,p.5). Thus a large proportion of elderly people live in households which do not include any members from the younger or more mobile sectors of the population who might be able to assist in overcoming problems of spatial access.

Age, sex and marital status are also related to economic status of the elderly. One sixth of men of pensionable age and one twentieth of all women in Hunt's sample were still working, all of these were younger than 80 and 66% ... less than 70 years old. Among those aged 65 or more who were married, 51% of husbands and 6% of wives received a pension from a previous employer. 14% of elderly married couples and 28% of unmarried people aged 65 years or more were found to be financially dependent solely on the old age pension or on supplementary benefit payments, (Hunt, 1978,p.5).

Thus in summary it may be said that over the age of 60 women are likely to live longer than men, are more likely to be widowed and living alone and to be financially dependent on social security payments from the state.

Use of Health Care

Demographic and socio-economic factors are also associated with health requirements of the elderly. Consultation rates rise rapidly with age beyond sixty years, the average number of consultations among persons of 75 years is higher than for persons of 65-74 years (see Tables 4:2 and 4:3). Overall, elderly women consult their GP more than men. In a Scottish study of patients aged between 62 and 92 years, 75% of men were found to have consulted their doctor in the previous year as compared with 85% of the women, also 46% of the women and 31% of the men consulted their doctor regularly (Milne and

Williamson, 1972). However the data in Tables 4:2 and 4:3 suggest that, while the consultation rate among women aged 65 - 74 is higher than for men in that age group, for those over 75 years, men consult their doctor more frequently than women.

The reason for these patterns of utilization must be to a large extent the result of the health care needs of the elderly. Nearly 60% of the elderly have some disability although more than 75% claim to enjoy good health (Hunt, 1978, p.72). The proportion in good health falls with age. Hunt's study found that about 60% of those aged 85 and over enjoyed good health, however, the report by Abrams on people aged 75 and over, states that only 40% enjoyed good health 'to a great extent' and the average person in this age group was found to be affected by about six different ailments. (Abrams 1978, p.9). Although researchers are not unanimous on the point, several authors have produced evidence indicating that individuals' assessments of their own health status generally correspond quite closely to the judgements of medical experts (Rosser and Kind, 1978). Maddox and Douglass (1973) and Suchman et al.(1958)are examples of authors who have reported a correspondence between self - and physician - ratings of health status for elderly subjects.

Among the most commonly occuring complaints for which the GP is consulted are cardiovascular, respiratory, alimentary and rheumatic. Cardiovascular disease is the most frequent reason for regular consultation. Men more frequently need to consult the doctor for respiratory disease than do women, while female patients more frequently seek medical attention for rheumatic problems. (Milne and Williamson, 1972).

The relationship of socio-economic status with need for and use of health care services is somewhat obscure, and there are relatively few studies of this problem which have focused principally on the elderly. There is, however, some evidence from America that in areas where the social status

of the population is high the proportions of elderly with disabilities are smaller than in lower status areas. (German, 1975). However, the relationship is a complex one and is difficult to explain, for example,it is not easy to determine the direction of the relationship, even if it does exist - does poor health tend to depress social status or does low social status tend to produce conditions detrimental to health? (McKinlay,1972,p.121)

Thus it may be seen that elderly people make more use of their GP than younger members of the population and that the consultation rate increases with age for persons over 60 years. This must be due at least in part to declining health and a corresponding increase in health needs with the onset of diseases which are particularly prevalent in old age. These illnesses are often of a chronic nature requiring regular medical attention over a long period. The evidence also shows that elderly women consult their doctor more frequently than older men. Thus the workload for doctors is greater for elderly patients (especially females) as compared with younger clients on the practice list. It is therefore possible that doctors may find themselves unable to take such clients onto their lists, particularly if they consider that the financial remuneration available does not compensate for the extra work involved, Karn, 1977, p.203-206. In such a situation elderly people may find that they have little choice in the doctor to whom they are allocated and it may not be possible for them to register with their nearest doctor.

Mobility

Social and demographic characteristics of elderly people seem to also be associated with the mobility of this group. The availability of transport by private car is likely to be an important aspect of mobility, particularly in contemporary society with its increasing dependence on private transport. Demographic and social factors appear to be related to car ownership and the availability of car transport provided by other drivers. 66% of the

elderly over 65 live in households with no car (Hunt,1978,p.111). More than 70% of households with an elderly head of household are without a car as compared with only 40% of elderly living in households with a younger head of household, (for example, those living with their children). Of elderly who live alone, 90% are without their own car (Hunt, 1978,p.112). Car ownership amongst the elderly population declines with age, especially after reaching the age of 70 years. The group with the least proportion of car ownership within the household is 75-80 years. The proportion of those who actually drive a car falls off even more rapidly with age especially beyond the middle 70's. Of those aged 65-69 26.9% are drivers as compared with 7% of those aged 75-79. These points are illustrated by Table 4:8 showing data from Hunt's study.

Women are less likely to be car drivers than men. A study carried out at the beginning of the decade indicated that for all age groups, 59% of men were licence holders as compared with 19% of women (Hunt,1978,p.113). Table 4:7 shows that the proportion of elderly women who hold driving licences is still smaller than the percentage of men. Women are also generally less likely to live in a household which owns a car. For people aged 65 and over (excluding those who are bedfast or housebound) 32.7% of men have a car in the household and drive it, as compared with only 6% of women. Those who have a car in the household but do not drive comprise 7.6% of elderly men and 19.8% of women over 65. A larger proportion of women than men live in households with no car (69% compared with 56.4% for those over the age of 65), (Hunt, 1978, p.111). Thus, the group with the highest percentage of people living in households without a car (72.8%) is women aged 75-84. For both women and men, the very elderly (85 years or more) are more likely to live in a household with a car than are those in the middle age group. Perhaps this is because very elderly people are more likely to be living in a younger household, especially with their children.

Travel difficulties in attending primary health facilities due to lack of a car within the household may be offset by the availability of car transport provided by others from outside the household. It was found that 17.6% of elderly people without a car are taken out by car at least once a fortnight by people from outside the household. A larger proportion of women (19.9%) than of men (14%) have lifts made available to them in this way, and the availability of lifts increases somewhat with age, as shown in Table 4:9. Table 4:10 shows data collected for those attending health centres at Shoreham and Whitney and also illustrates the fact that women are less likely to have car transport than men.

Availability of a car is also related to household composition. The percentage of those over 65 who are able to go out of the house and who do not have a car belonging to their household is 86.4% for elderly people living alone, 60.6% for elderly married couples, but only 36.3% for elderly people who live in a household where the other members are all younger than 65. This effect is offset by the availability of lifts given by others from outside the household. The proportion of elderly people who have no car in their household but are taken out at least once a fortnight is 30.2% for elderly people living alone, 14.9% of elderly married couples, as compared with 6.8% of those living in a household where the other members are younger. (Hunt, 1978, p.113)

Socio-economic status might be expected to have an influence over availability of car transport, however, since most retired elderly people have lower incomes than working members of the population, this effect may not be very readily detectable. Also the poor health of some elderly people who could afford to run a car prevents them from doing so in many cases. There is some indication that on a regional basis, car ownership is more common among households from more affluent regions than those from less wealthy parts of the country. Among households including elderly people in the South East and South West of England 40% own cars, as compared with

only 25% in the North East and North West, and 32.5% nationally. (Hunt,1978, p.112). A point of special interest in the context of the present study of East Kent is that elderly families living in retirement areas were found to have high car ownership, over 40% of households containing elderly members have a car in these areas. As would therefore be expected, more people in retirement areas have their own household car and drive it (24.5% as compared with 16.6% nationally) and slightly more elderly people living in retirement areas are driven in cars belonging to the household (15.9% compared with 15% nationally). However, the proportion of elderly people without a household car who are taken out in a car at least once a fortnight is lower in retirement areas (13.1%) than nationally (17.6%) (Hunt,1978,p.113).

Thus the elderly as a group are less likely to have their own means of private transport than are younger members of the population. Elderly car drivers are most likely to be men in their sixties,while women, and those over the age of 75, are less likely to drive a car. For elderly married women car transport may often be provided by the husband, while elderly women living alone are the group least likely to have a household car, particularly those in the middle age group of late 70's and early 80's. However, this group of women are most likely to be taken out fairly regularly in the car by drivers outside their household. In retirement areas car ownership by elderly households is higher than for the country as a whole, but the availability of lifts for those who do not own a car is comparatively low. Such a situation is perhaps likely to be most disadvantageous to elderly women in the middle age group living alone in retirement areas.

Mode of Travel to the Doctor's Surgery

The availability of car transport is significant to the question of the travel mode used to attend a doctor's surgery, and the accessibility of the surgery, since most elderly people who have a car in the household use it and a significant proportion use car transport to go to their GP. At the national level, 25% of the elderly population aged 65 or more use car

transport to travel to the doctor or to hospital (in retirement areas the figure is 34.6%) (Hunt,1978,p.116). Furthermore, information collected at the more local level suggests that the proportion of elderly patients who attend a doctor's surgery by car varies from one practice to another (Table 4:11)

Results from Hunt's report on the national survey of elderly over 65 indicated that socio-demographic characteristics are associated with use of the car to attend the doctor or hospital. Some of the relevant information is illustrated in Table 4:12, and may be summarized as follows: Of all elderly people 12.4% drive themselves to the doctor or the hospital but for men, the corresponding figure is 23.4% as compared with 5.1% for women. The proportion of people who drive themselves to the doctor or to hospital is much higher for those aged 65 - 74 than among people aged 75 - 84. Only 3.9% of men over 65, compared with 12.1% of women are driven to the doctor or to hospital by other members of the household. It was found that 3.3% of elderly over 65 were driven to the doctor or to hospital by drivers outside the household, but the proportion of women was 4.0% compared with 2.4% of men, and the percentage was 4.9% for those aged 75-79 compared with 2.5% for those aged between 65 and 69, and 3.3% for those over 85. Household composition is also related to travel by car to the doctor. Those who drive themselves to the doctor or to hospital constitute a larger proportion of those living with an elderly spouse than of those with other types of household composition. A higher percentage of those living with a younger family are driven by other members of the household, compared with other elderly people. Those who are driven by people outside the household constitute a larger proportion of elderly living alone than of elderly in households of two or more, although for those living alone the percentage driven by others is exceeded by the percentage who drive themselves to the doctor or to hospital.

Some studies conducted at a more local level also provide information

on variations in the use of cars by the elderly to attend the doctor's surgery. Figures from three studies of health centres are shown in Table 4:11. The data from Whitney and Shoreham would correspond with the findings of Hunt's survey that fewer women use a car than men. The figures for Wallsend show very low car use and no difference between the sexes, but this may be due to the fact that the use of a car by elderly people in the Newcastle area is particularly low. (Skelton, 1977,p.9).

The distance between the patient's home and the surgery also appears to have some bearing on whether car transport is used to travel to the GP. Two studies, one of six semi-rural practices (Hutchinson, 1969) and one of 34 practices (Peacock and Pinsent, 1973) collected information relating distance travelled to attend the surgery with the mode of transport used. Both studies include data for both young and elderly patients and some of the results are shown in Tables 4:13 and 4:14. The main result, found by Pinsent and Peacock to be statistically significant, is that for distances less than one mile patients are more likely to walk to the surgery and for distances over one mile they are more likely to use some means of transport, in the majority of cases a car. A consideration of the data in Tables 4:13 and 4:14 indicates that the proportion of people travelling by car increases with the distance travelled. The proportion of elderly people driven by others to the surgery also appears to increase with distance (Table 4:14), a conclusion supported by the study of travel patterns of elderly people in Newcastle which found that elderly people were more likely to get lifts for long or difficult journeys than for shorter, easy ones. (Skelton,1977,p.10)

The effects of distance to the surgery on the likelihood of walking to the GP have already been mentioned; 67-80% of those who walk travel less than one mile and over 90% of walkers travel less than two miles. 43.6% of the elderly aged 65 years or more walk to their doctor's surgery, but the proportion declines with increasing age. It was also found that of those aged 65-69, 49.2% walked to the doctor, but only 27.8% of those over

the age of 85 do so (Hunt, 1978,p.122).

If private car transport is not available,then public transport is an alternative to walking to the doctor's surgery. 22.4% of elderly people over the age of 65 in England and Wales have been found to travel by bus to the doctor's surgery, (Hunt, 1978,p.122), although some more local studies have found smaller proportions of those over 60 using a bus. The proportions quoted in these reports vary. Hutchinson (1969,p.96) has quoted 13.9%, and results from other practices are shown in Table 4:11. Table 4:15 shows how the proportion varies with age for people over the age of 65 years. The age group for which the largest percentage use the bus to attend the surgery is between 70 and 80 years and it seems likely that this may be related to the fact that this is the age group which, as explained in the preceding discussion, is least likely to have access to transport by private car. (Hopkin et al, 1978, p.21). In view of the data quoted earlier, one might expect to find that a larger percentage of women than of men use public transport for this purpose. There is some evidence that this is the case from local studies of transport to surgeries and health centres in Whitney, Shoreham and Wallsend (Table 4:11). After a health centre was established in the Wallsend area in a location convenient for bus services, the use of the bus increased and was recorded for 31% of attendances by men and 38% of those by women. However, it has already been noted that travel patterns in Newcastle, where car travel is less common and buses are used more frequently, may be atypical of national patterns or of those to be expected in East Kent.

There does not appear to be a strong association between the distance to be travelled and the tendency to take a bus to the doctor's surgery, but Tables 4:13 and 4:14 would seem to suggest that patients in general are more likely to take the bus if they need to travel more than one mile.

The use of public transport will obviously involve paying fares which will increase in proportion to distance in most cases, except where elderly

people are able to travel free on public transport, or are charged a fixed rate irrespective of distance. Evidence from Hunt's study suggests that such concessions are less likely to be available to elderly people living in retirement areas than those in other parts of the country. For England and Wales as a whole, 68.6% of people over 65 were aware of special arrangements for the elderly to use public transport free or at reduced cost, but in the retirement areas only 17.7% reported such facilities. Of all those interviewed nationally, 15.4% replied that there were no such facilities available to them, compared with 68.8% in the retirement areas. (Hunt,1978, p.118)

In summary, public transport may be more often used to travel to the doctor's surgery over distances more than one mile than for journeys of less than a mile. Among the elderly, the bus is more often used by women than men, and those in their 70's may use the bus more than other age groups. Those who appear to make most use of public transport seem to correspond with the group least likely to have car transport available. In retirement areas the costs of using public transport are likely to be higher than for the elderly elsewhere.

Accessibility of the Doctor's Surgery

The mode of transport used will influence the relationship between the distance to be travelled and the time taken to reach the doctor's surgery, and for this reason variations in time taken for different socio-demographic groups or different parts of the country are difficult to analyse. Hunt's survey shows that about 80% of elderly people have to travel for more than five minutes to the doctor's surgery, and 25% travel for more than a quarter of an hour. (Hunt, 1978, p.122). It was found that the time taken to travel to the doctor's surgery was longer than for trips to other local service facilities such as shops, post office, chemists, etc. Hopkin et al (1978, p.31) also found that in Guildford, the longest journeys for old people were those made to the hospital or to the doctor's surgery.

Physical difficulty encountered in walking to the doctor's surgery is likely to increase with the distance to be travelled, especially for distances exceeding one mile. In a study of elderly people in Exeter it was found that of 42 respondents claiming to have generally good health, only 34 considered themselves capable of walking over a mile, while only 7 out of 32 people in poor health thought they could do so (Glynn-Jones, 1975,p.48). The study in Guildford by Hopkin et al (1978) showed that 44% of all elderly people over 65 experienced difficulty in walking due to ill health and the proportion increases with increasing age. Those with difficulties in walking also included a higher proportion of people who had given up driving (61%) than did those who walked without difficulty (47%). Thus those in poor health are likely to be doubly disadvantaged by being unable to walk easily and without any means of private transport. Also, patients who most frequently needed to make journeys to the doctor's surgery due to ill health were most likely to be those who had difficulties in walking, and at the same time must walk or travel by public transport, and therefore had the longest journey times. Elderly people visiting the doctor more than 10 times each year had a mean journey time to the doctor's surgery of 18 minutes compared with 13 minutes for those seeing the doctor only 1 - 3 times in a year (Hopkin et al, 1978, p.30).

Few studies appear to have asked direct questions about difficulty experienced in getting to the doctor's surgery. However, a study in Worthing (Worthing Community Health Council, 1977,p.82) found that difficulties were reported by 12% of those over 65. The proportion having difficulty was smaller for those aged 65 - 74 (8%) than for those over 75 (19%). Bevan and Baker (1977, Table 5:3) found that after a health centre had been established in a town in Kent, 19% of patients surveyed over the age of 60 experienced travel difficulties in reaching the centre, of whom the majority were women over 65 years.

Associations between Access and Use of Health Care

The existence of access problems for elderly patients seems to have some association with the mode of use of health services by the elderly. Hopkin et al (1978,p.30) suggested that patients who experience difficulties in walking due to illness are most likely to be suffering from chronic conditions.These do not give rise to sudden attacks of serious illness of the type for which the doctor is most likely to be called out. The authors argued that those with difficulties in walking will receive fewer home visits than those who walk without difficulty. However, in a study carried out in Whitney (Bevan, Dowie and Kay, 1975,p.1039) it was found that 44% of home visits were to patients aged sixty years or more, although this group only constituted 12.5% of the total practice population. Of these home visits to elderly people, 5% were considered by the doctor to be unnecessary and 27% would not have been necessary if special transport could have been provided. For the practice population as a whole, 18% of home visits were necessitated due to lack of special transport facilities and of these 65% were to people over 60 years of age. 52% of home visits which could have been avoided if special transport had been available were to elderly people without access to a private car. National survey data shown in Table 4:4 illustrates the fact that for old people aged 75 years and over consultations at home are more frequent and consultations at the surgery are correspondingly less frequent than for patients aged 65 - 74 years. Thus those in the oldest age groups are particularly likely to require consultations at home and a significant proportion of home visits probably might have been conducted at the doctor's surgery if better transport were available to make access easier. However, it is possible that those with most limited mobility are also most likely to find it necessary to travel to the surgery rather than see the doctor at home, and this may reduce their consultation rate. In a study of health care utilization by

groups of elderly people in America, German (1975,p.328) found that those respondents who perceived access to health services as low were also more likely than the others to perceive a need for medical care but not seek it.

To summarize, therefore, one would expect that those elderly people most likely to have problems in gaining access to their doctor's surgery are those who need frequent medical attention and who are living relatively far away from the surgery, especially at a distance of a mile or more. The probability of access difficulties is particularly likely when there is no private transport available for the journey to the surgery, especially when there are no concessions for elderly people on fares for public transport. The availability of private transport is likely to be most limited for women in their seventies who live alone, and their problems are likely to be greater since they are a group which are likely to require relatively frequent consultations with their doctor. Those attending the doctor's surgery most often tend to have longest journey times to the surgery, and elderly people who are faced with access problems in reaching the surgery may be more likely to require visits from their doctor at home, although it is possible that they are also the group which most frequently find it necessary to travel to the surgery. Those for whom the surgery is relatively inaccessible may tend to forego some consultations on certain occasions when they feel a need to see their doctor.

Access to Other Types of Primary Health Facility

Some data are also available about travel to other types of primary health care facility. Hunt's study provided information about travel to the nearest chemist's shop and showed that the majority of elderly people walk to the chemist (56.1%). However, the proportion who walk to the chemist is higher (62.4%) among the younger elderly aged 65 - 69 than among the oldest groups, (53.4% for those aged 75 - 79, 40.7% for those aged 85 and over). These older groups are more likely to travel to the chemist by

bus or by car driven by someone else, and they also include a greater proportion of bedfast and housebound people who would not be able to reach a chemist. Thus the oldest age groups are most likely to be dependent on others to get prescriptions from the chemist. Journey times are shorter on average than for trips to the doctor's surgery. 30% of the elderly live within 5 minutes of their nearest chemist and only 16.5% have a journey of more than a quarter of an hour. In less densely populated areas, the elderly are more likely to need transport to the chemist, and journey times are longer than in more densely populated parts of the country (Hunt,1978,p.121). These data would seem to suggest that chemists shops are more accessible than doctor's surgeries and would therefore be less likely to present problems of spatial access. However, some local studies have highlighted the existence of difficulties due to closure of dispensing facilities at small chemists and a greater concentration of dispensing at chemists in main shopping centres and at health centres. The National Corporation for the Care of Old People reported widespread cases of long journeys to collect prescriptions involving expensive bus fares. Also the problem of having to make more than one journey to obtain medicines on prescription is mentioned, (Norman, 1977, p.63-64). A report of a survey in Southwark, London, is also quoted by Norman in which journeys of at least thirty minutes to the chemist were necessary for many elderly people. The study of the elderly in Worthing found that 3% experienced difficulty in collecting prescriptions, most of whom lived in rural areas, (Worthing CHC, 1977, p.80).

Some of those living furthest from a chemist are therefore likely to find dispensing facilities inaccessible, especially in areas where small local dispensaries have been closed. Access may also be a problem for those who have difficulty in walking owing to poor health,and for those in the oldest age groups for whom car transport is not provided by someone else with a vehicle. It seems likely that the proportion with such difficulties

in respect to access to the chemist will be smaller than of those experiencing problems in attending the doctor's surgery.

For outpatient services provided from hospitals, on the other hand, the likelihood that access will be inadequate for elderly people is greater since the journey is likely to be longer to the hospital. However the total number of patients involved will be smaller since fewer use outpatients clinics than doctor's surgeries and chemists. The study by Hopkin et al. in Guildford shows that relatively few of those attending outpatients clinics had a household car and that less than a third of the journeys to outpatients departments were made by car, the majority travelling on foot, by bus or by ambulance. This study showed that those who walked to the hospital had on average a shorter distance to travel (0.8km) than those using transport (2.2 - 2.4km). The average travel time to the outpatients clinic was considerably longer for those walking or using public transport (especially for bus passengers) than for those travelling by car. Patients most frequently making journeys to hospital were also those with difficulties in walking. This is not surprising since 60 - 70% of outpatient visits are for physiotherapy, orthopaedic treatment and fractures (Norman, 1977,p.65). The study in Guildford revealed that 27% of those who found walking difficult had attended the hospital in the previous year compared with 17% of those without difficulty (Hopkins et al, 1978,p.31.)

Those most likely to experience problems of access to outpatients clinics are therefore expected to be those with low mobility due to the factors already discussed and also those who most frequently need to make journeys to outpatient facilities.

The Geographical Experience of the Elderly

In Chapter 3 it was argued that an individual's image of space and the extent of the action space will influence the perceived accessibility of health facilities. Two studies of the geographical experience of the

elderly are mentioned in this connection. Rowles conducted a detailed study of the lives of five elderly people and hypothesised a changing emphasis in the geographical experience of older people. These changes involved constriction, selective intensification and expansion,(Rowles,1978, p.196). Rowles defined the process of constriction as the tendency towards limitation and closure of the lifespace manifested in actions. At the same time, the psychological world of feeling and orientation becomes concentrated increasingly on particular places, causing selective intensification, while there is an expansion of the role played by fantasy in the individual's overall geographical experience.

Awad et al (1979) have reviewed the limited number of studies on this subject, and reported the results of a survey of a sample of elderly respondents in Los Angeles, USA. This research provides evidence of correlation between patterns of use of local service facilities, social, demographic and health status, and measures of the extent of respondents' knowledge of their action space and geographical mileu.

CONCLUSIONS; A HYPOTHETICAL MODEL OF SPATIAL ACCESS TO HEALTH CARE FOR THE ELDERLY

The discussion in this chapter has identified certain population characteristics which are hypothesised to be likely to produce particular problems of spatial access to health care facilities for elderly people. The evidence considered from survey data on elderly respondents has also suggested that not all individuals over the age of 60 will have these characteristics and that in only a minority of cases will the combination of circumstances experienced by an individual be such as to result in spatial inaccessibility which is perceived by the individual to present a difficulty in obtaining primary health care.

The characteristics which are hypothesised to be relevant to the problem are also likely to display rather complex interrelationships one with

another, as explained above. These interrelationships are summarized in Figure 4c. The figure identifies three groups of factors, socio-demographic and health characteristics; mobility; and access to health care and patterns of use. Demographic, social and health characteristics of the elderly population are linked to spatial access indirectly through their associations with mobility characteristics of the elderly. Figure 4c therefore, illustrates a further modification of the conceptual framework shown in Figures 4a and 4b, and suggests the way in which population data might be organized to test the associations which have been predicted on the basis of national survey data. The account in Chapters 7,8 and 9 will describe the research carried out to test the conceptual model set up in this chapter by analysis of data from a case study of elderly individuals in Whitstable and Broadstairs.

CHAPTER 5

A METHOD FOR ANALYSING HEALTH FACILITY LOCATIONS

The literature reviewed in previous chapters has shown that spatial accessibility is one of the factors which affects the pattern of availability of care provided in health facilities. It has also been demonstrated that demographic, health and mobility factors cause certain population groups to be more likely to experience significant barriers of spatial access to health care than others. Another group of factors which influence variation in spatial access between different population groups was identified as characteristics of the health care delivery system, including the distance to be travelled to obtain health care. The way in which facilities are distributed in space in relation to the population they serve is obviously important with respect to spatial accessibility of health facilities. This Chapter is concerned with the problem of measuring how the locations of facilities affect distance to be travelled for the client population. The discussion relates to alternative methods which have been proposed for measuring this affect, and for making decisions on the location of facilities which will achieve the desired balance in distance to be travelled between different groups in the population.

In Chapter 1 it was shown that the ministerial decision about resource distribution between different population groups may be considered as a form of cost benefit analysis, weighing the benefits to be derived by individuals or groups from public intervention against the cost to society of that intervention. In the case of health facility location, the objective of 'the Minister' as described in Chapter 1, is to ensure that the distance to be travelled to the facility does not present a barrier to those needing health care. (In Chapter 2, it was shown that

decisions about locations of individual facilities at the local level are in fact made within Area Health Authorities, not at the ministerial level. However, the same objectives should apply to the local decision as to central resource distribution.) In the following discussion a number of assumptions are made to permit concentration on the particular issue of how facility location causes access to vary and it is necessary to clarify the nature of these assumptions.

The arguments in Chapters 3 and 4 have shown that the friction of distance will be greater for some individuals than for others, and also that medical need for care varies. However, it is assumed for the moment that a simpler, hypothetical case pertains in which friction of distance and need for care is equal for individuals in the service population. For the moment, it is also assumed that the number of facilities to be provided has been determined on the basis of factors such as the size of the service population, economies of scale, the quality of care which can be provided in centres of different sizes, and the cost of constructing and operating each facility. Under these assumptions the planning problem is one of how to locate this given number of facilities in order to serve a given population in such a way that the objective of an equitable pattern of spatial access is achieved as far as possible in the most efficient way.

Decisions on location of facilities would in reality involve other issues in addition to the objective of achieving the required pattern of spatial access to health care for clients. One of these would be the relative costs of installing and running facilities at alternative locations. It is assumed that the installation and running costs of the facilities themselves do not vary for different locations, although this is, of course, not the case in reality.

Given these assumptions, the concern in health facility planning should be to ensure that no individual must travel so far to health care that he is likely to experience a barrier of spatial access. A situation

is envisaged in which the service area is sufficiently large, and the number of facilities sufficiently small, to necessitate journeys to the service centres for at least some clients which are long enough to present barriers of spatial access.

Under these circumstances, the choice of sites for facilities would be governed by the objectives of reducing as far as possible the average distance to be travelled to the facilities for all members of the service population, and ensuring that individual clients are not at a much greater distance from facilities than others. Smolensky et al (1970)have considered the solution to this spatial planning problem in the hypothetical situation of the isotropic plain. In the context of health facility location this would be the case in which, in addition to the assumptions already stated, the cost of travel in the service was ubiquitously related to distance in a constant way, and the population was evenly distributed in space. These authors argued that in such a situation, there would be a distribution of facilities which would both minimize the distance travelled by individuals and reduce as far as possible the amount of variation in distance travelled, so that the number of individuals travelling a greater than average distance would also be as small as possible.

THE LOCATION - ALLOCATION PROCEDURE

In order to assess the degree to which a set of health facilities provided under the hypothetical conditions of the isotropic plain corresponded to the most efficient and equitable distribution, it would be necessary to discover what this optimal distribution would be. One method of discovering the optimal distribution of a given number of facilities,for a given population distribution,is provided by the location-allocation method.

In its simplest form, the location-allocation procedure generates a solution to the dual problem of combining an efficient distribution of facility locations with an efficient allocation of the service population to these points, so that the overall 'costs' involved in gaining spatial access to the facility are minimized in the service system. (The criterion used to measure travel costs is considered below.) Scott (1971a, Chapter 7) describes the two basic elements of the location-allocation problem as the transportation problem and the Weberian location problem; his explanation is summarized in the following discussion.

The transportation problem

This part of the procedure assumes there to be a number of central facilities (m) with locations which are known, and a total of n demand points representing the locations of the service population. (Scott, 1971a, p.61.) The problem is to minimize the following linear flow function;

$$Z = \sum_{i=1}^{i=m} \sum_{j=1}^{j=n} d_{ij}\, p_{ij} \qquad (1)$$

When d_{ij} = the distance between facility i and demand point j

and p_{ij} = the number of people at point j who are to use the services at facility i.

(p_{ij} is always greater than, or equal to zero, so that there are no negative flows)

The solution is subject to the constraints that the number of people from point j using facility i shall not exceed the capacity of facility i (q_i) nor fall below the number living at point j who need to use the service (r_j). These constraints are expressed as follows:

$$\sum_{j=1}^{j=n} p_{ij} \leqslant q_i \qquad (i = 1,2,.....m) \qquad (2)$$

$$\sum_{i=1}^{i=m} p_{ij} \geqslant r_j \qquad (j = 1,2,.....n) \qquad (3)$$

The Weberian location problem

This may be expressed as the problem of finding the location for a single central facility for which the overall 'costs' of flows between the central facility and the locations of the service population is a minimum. This position is known as the Point of Minimum Aggregate Travel (P.M.A.T.) (Scott, 1971a,p.119) It is assumed that the number of people from each residential location who need to use the facility is fixed and known in advance. The total number of locations to be served is known to be equal to 'n'.

The problem is expressed mathematically as one of finding the coordinate, (U*,V*), of the central facility which minimizes the function,

$$Z = \sum_{j=1}^{j=n} r_j \left[(U^* - u_j)^2 + (V^* - v_j)^2 \right]^{\frac{1}{2}} \qquad (4)$$

when U*,V* = cartesian coordinates of the i^{th} facility

and u_j, v_j = cartesian coordinates of the j^{th} service point.

and r_j = the demand at the j^{th} point.

The optimal partitioning problem

The allocation and locations solutions in equations (1) and (2) are combined in the optimal partitioning problem, which is the basic form of the location-allocation method most frequently used (Scott,1971a,p.122). If the number of facilities (m) is given, then the problem becomes one of locating the m facilities and allocating the service population between them in such a way as to minimize the total travel costs for the system as a whole. For a set of facilities in continuous space, the problem is expressed in algebraeic terms as one of minimizing the function,

$$Z = \sum_{i=1}^{i=m} \sum_{j=1}^{j=n} \lambda_{ij} r_{ij} \left[(U^* - u_j)^2 + (V^* - v_j)^2 \right]^{\frac{1}{2}} \qquad (5)$$

It is assumed that there is no limit to the capacity of facilities, so that the population at each point can be served completely by one facility. Therefore, the following constraint applies:

$$\sum_{i=1}^{i=m} \lambda_{ij} = 1 \qquad (6)$$

when λ_{ij} is equal to 1 if the population at j is assigned to facility i and is otherwise equal to 0.

One algorithm which may be used to carry out the optimal partitioning procedure in continuous space is a FORTRAN programme called NORLOC, designed by Nordbeck and Rystedt (1971). Initial positions for the facilities are specified by the user.

By an iterative process, the facility locations are shifted, and the population reallocated to them until the sum of access costs has been reduced to as small a value as possible.

The algorithm calculates the access costs over the whole system of moving the service population from their residential locations to their nearest facility (to which they are allocated.) The use of the NORLOC procedure is described in greater detail in Chapter 6.

One of the difficulties of using an iterative procedure of this sort is that it is difficult to discover the absolute minimum value of the total access costs for the population. The algorithm searches for a local minimum, but this may be one of several minima and there is no guarantee that the solution found represents a global optimum. The solution produced will partly depend upon the initial locations chosen for the facilities, so that in order to be more confident that the global optimum has been found, it may be advisable to experiment with a variety of starting positions for the facility locations.

A further problem in using a procedure such as NORLOC is that it

assumes the system to be closed, that is to say that the facilities considered are the only ones serving the population and there are no flows between the service area being analysed and other adjacent areas. Also, NORLOC assumes that any position within the service area is a possible location for a facility, although in reality the number of feasible sites will probably be limited.

Another type of algorithm which is also available is network analysis described in Scott (1971a, Ch.6). This operates by iterating facility locations along a network of nodes and links, rather than moving them freely in space. This would be a method corresponding more closely to reality than the NORLOC algorithm especially for large service areas, since it incorporates constraints on the practicable routes for travel to facilities and on feasible facility locations. However, the technique of network analysis would be a very much more complex procedure, since travel cost measures must be developed independently for each link. It was therefore decided that for the purposes of this research location allocation analysis using the NORLOC method would be more appropriate.

Given the assumptions discussed above, and within the limitations described, the optimal partitioning procedure carried out by a programme such as NORLOC has potential for analysis of the spatial efficiency of a system of health facility locations for provision to clients with a given distribution in the service area. The spatial efficiency of a facility distribution is the degree to which the expenditure of available public resources on facilities in particular locations achieves the desired pattern of accessibility to the facilities for the service population. It has been shown that in the hypothetical case of the isotropic plain, the most equitable and desirable distribution is that which minimizes total travel, in which each facility is located at the Point of Minimum Aggregate Travel (PMAT). It is possible, given a value for the optimal

total travel cost to calculate a 'spatial efficiency ratio' (Symons,1973,p.39), comparing the total travel criterion value for any given facility distribution with the minimum possible value implied by the PMAT.

MODIFICATIONS TO THE SIMPLE LOCATION-ALLOCATION PROCEDURE

The following paragraphs consider the potential uses of the optimal partitioning algorithm for analysing the spatial location of facilities in a service system when some of the assumptions made in the discussion above are relaxed to allow an element of variation in some aspects of the service system. The possibility is discussed of considering health facility planning problems in which different numbers of facilities are included in alternative proposals for health care provision, where the friction of distance in space is not directly proportional to distance, where the population density is not homogeneous, or where the need for care and the effects of the friction of distance are unequal among the service population.

Analysing the Effects of Providing Different Numbers of Facilities

The optimal partitioning algorithm requires that the number of facilities is predetermined and fixed for each optimization procedure. However, it is possible to repeat the procedure with a different number of facilities in each run and to compare the size obtained for the minimum possible travel cost criterion from each analysis. For example, it is possible to compare the result obtained by iteration of one service facility serving the whole service area with the costs calculated from iteration of a number of different facility locations with the service population divided between them and allocated to the nearest centre. This technique was applied in the analysis reported in Chapter 6 of this thesis to demonstrate the effects on travel cost of providing a single health centre to replace separate surgeries.

The Concept of Non-Linear Variation of Travel Cost with Distance

In the optimal partitioning criterion described above travel cost is assumed to vary simply in proportion with distance, travelled. However, the literature discussed in Chapter 3 has shown that short distance may have virtually no frictional effect on human activities in space, while long journeys may present a considerable barrier. Thus it may be more realistic to consider travel costs as a function of distance in the form.

$$E = A + C\, D_{ij}^{B} \qquad (7)$$

When E is the travel cost and D_{ij} is the distance travelled, and A,B,C are constant terms.

By representing travel cost as a power function of distance travelled much greater emphasis will be placed on the travel cost for those living furthest from the facility than for those living close to the centre. The optimal partition can be made to incorporate this term, and NORLOC programme has this facility. The criterion with this modification for optimal partitioning would take the form:

$$Z = A \sum_{j=1}^{j=n} r_j \left[(U^* - u_j)^2 + (V^* - v_j)^2 \right]^{\frac{1}{2}B} \qquad (8)$$

(It is assumed that A and B are greater than zero)

Analysing a Service Area with a Varying Population Density

If instead of the isotropic plain a slightly more realistic model is considered with an unevenly distributed population, then the two goals of cost minimization for the population as a whole, and equity of spatial access costs between individuals diverge. In this situation the simple optimal partitioning procedure (when the constant B in equation 8 is equal to one) will tend to generate a solution which moves facilities towards parts of the service area where most of the population is

concentrated. Those individuals in more sparsely populated areas will have relatively high travel costs and the variance in distance to be travelled will not be at a minimum when the average distance travelled is minimized. In selecting an 'optimal' pattern of public facility locations, a trade-off would have to be made between conflicting objectives. Spatial efficiency could be assessed in terms of two desirable goals implying different location solutions of total cost minimization and minimization of variance of cost between individuals.

Morrill and Symons (1977) have suggested that it would be possible to produce location solutions which optimize different objectives to a varying degree by introducing different power functions into the calculation of the total travel cost criterion. The Point of Minimum Aggregate Travel discussed above, uses a power function of 1, so that the travel cost criterion is calculated as,

$$F = \sum_{j=1}^{j=n} P_j \, D_{ij} \qquad (i = 1,2,.....n) \qquad (10)$$

When P_j = the number of clients at the j^{th} point,

and D_{ij} = the radial distance from the population at j to the centre, i. It has been shown that this solution would minimize the total travel costs for the population.

An alternative type of solution, the Area Centroid is computed by minimizing the function.

$$F = \sum_{j=1}^{j=n} P_j \, D_{ij}^{3} \qquad (i = 1,2,.....n) \qquad (11)$$

As explained above, this type of solution would tend to give very high weight to those living furthest from the facility location, and would therefore reduce as far as possible the number of people living at a greater than average distance from the nearest facility. This criterion

would promote the second planning objective of ensuring that the facility location is not inequitable for individuals.

Morrill and Symons proposed that a third type of criterion, the Centre of Gravity would correspond to an intermediate position between the two different planning objectives. This would be calculated using the following function of distance:

$$F = \sum_{j=1}^{j=n} P_j D_{ij}^2 \qquad (i = 1,2.....n) \qquad (12)$$

A fourth type of criterion for evaluating spatial efficiency has been suggested by Gordon (1977) which would produce a solution most closely related to the area centroid. This method would use variability between individuals as the criterion to be minimized, disregarding the question of the total spatial access costs of the system overall. This criterion may be expressed as follows:

$$F = \sum_{j=1}^{j=n} \bar{d} (P_j D_{ij}) + (P_j D_{ij})^2 \qquad (13)$$

Where $\bar{d}$ = average distance for each member of the population. (It is assumed that $\bar{d}$ is known for this calculation; the result of the PMAT solution, averaged over the population was used in the analysis reported in Chapter 6).

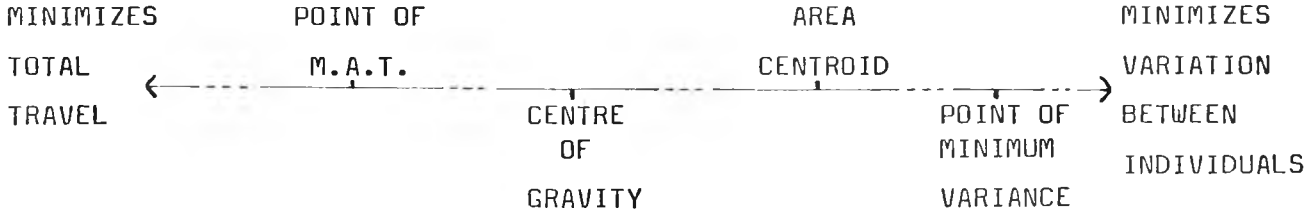
This function is derived as follows:

$$\text{Variance of } d_{ij} = \sum_{j=1}^{j=n} (d_{ij} - \bar{d}) (d_{ij} - \bar{d})$$

$$= \sum_{j=1}^{j=n} d_{ij}^2 - 2\bar{d} \sum_{j=1}^{j=n} d_{ij} + n\bar{d}^2$$

$$= \sum_{j=1}^{j=n} d_{ij}^2 - \bar{d} \sum_{j=1}^{j=n} d_{ij}$$

Thus the use of alternative criteria in the optimal partitioning solution might be used to generate plans for facility distributions which would range along a continuum between minimization of the average travel costs of the system and minimization of inequitable variations between individuals in distance to be travelled, as illustrated below.



Chapter 6 reports an analysis of the spatial efficiency of doctors surgery facilities in East Kent. The distribution of the surgeries was assessed by comparing the total cost criterion for the existing facility distribution with that of the optimal solutions, using the four criteria described above.

The computed positions generated for facilities by the optimal partitioning procedure are also of interest in assessing the degree to which the desired pattern of spatial accessibility is achieved. This was demonstrated by the work of Schneider (1967) using information on the residential distribution of patients using hospitals in Cincinnati, USA. He compared the actual hospital locations with the PMAT for the distribution of users. (The PMAT was obtained using the solution to the transportation problem for a single facility.) The comparison was made by means of a 'locational imbalance vector', a straight line linking the actual hospital position with the PMAT. The vector conveyed information about the efficiency of the existing hospital locations by means of its length and direction. A long vector represents a less efficient location than a short vector, and the direction of the vector indicates the direction in which the hospital should be moved in order to be more

efficiently located. This application of the transportation problem assumed that certain patients will always use a particular hospital; and is designed to enable planners of private hospitals like those in the USA to make the location of hospitals as efficient as possible in relation to the location of their clientelle. It would also be appropriate for locating specialized facilities each of which treated different types of patient in a given service area. However, in the case of the British General District Hospital, for example, the problem would be how to maximize efficiency of the hospital system as a whole. It would therefore be more appropriate to use the location-allocation technique to find how to alter the locations of the entire set of facilities or that subset for which relocation would be feasible.

Other authors have also applied location-allocation procedures to problems of health facility planning using different criteria corresponding to different planning goals. For example, Achabal (1978) applied a type of location-allocation technique to the problem of locating emergency medical services. The purpose was to minimize the 'spatial' costs of patient travel to emergency services and the resource costs of providing the facility. There was an upper limit placed on the distance patients should travel, based on the minimum acceptable probability of survival. This model was therefore based on the assumption that patients' chances of survival were greater the shorter the distance they had to travel to obtain health care in event of emergency illness.

Similarly Holmes et al (1972) used a location-allocation model designed to optimize the location of day care facilities in such a way that the catchment area is defined by a threshold distance which is the maximum which patients would (or should) travel to obtain the service.

The Problem of Differing Need for Care and Varying Mobility in the Service Population

To this point, the discussion in this chapter has assumed a homogeneous population with respect to medical state and mobility. If this assumption were not held, then it would be necessary to incorporate into the procedure a system of weights applied to the service population, so that the travel cost (however measured) for individuals with high medical need or low mobility would be emphasised more than those for more mobile clients in better health. Chapter 6 reports an attempt to introduce a weighting technique applied in the analysis of East Kent health facilities to give greater importance to the elderly compared with other members of the population.

THE QUESTION OF CONSUMER BEHAVIOUR

The solutions from location allocation procedures relate to a situation in which clients all use their nearest facility. In fact, the evidence reviewed in Chapter 3 has shown that clients do not always use the nearest general medical facilities when they have a free choice between alternatives. However, if it is argued that the quality of care available from each facility is the same, and that all clients are free to use their closest facility, then it is justifiable to assume that they will do so when assessing the spatial efficiency of health facilities. It could be argued that, provided that an individual needing health care could obtain that care from his nearest facility without experiencing a spatial access barrier, then his position would not be inequitable if he found difficulty in reaching an alternative, more distant, centre to obtain care.

However, the distribution of resources would be spatially inefficient, in terms of both objectives of facility location planning considered here, if there were restrictions on the capacity of facilities which made it impossible for everyone to use their closest facility. The NORLOC

optimal partitioning procedure may be used to solve the transportation problem without relocation of facilities in order to test whether the actual capacity of facilities corresponds to that required for all clients to be able to use their closest facility. This application of the NORLOC technique was employed in the investigation reported in Chapter 6.

COMPENSATION TO CLIENTS AS AN ALTERNATIVE TO FACILITY RELOCATION

The location allocation procedure has been shown to have potential as a tool for analysing the spatial efficiency of facility locations given different objectives. However, it remains for the planner to make value judgements about what these objectives should be. This chapter has been concerned with two objectives which would be important given the view of social justice which has been adopted here. In order to decide the most desirable distribution of health facilities it would be necessary to choose a balance between these two considerations. Some authors have proposed cost benefit models for discovering the planning solution which will achieve the optimal balance of multiple goals which have been weighted according to their relative importance.

McGuire and Garn (1969,p.888) suggested that the decision maker should develop "an explicit preference function between need and efficiency" in order to resolve this set of problems. They describe a cost benefit procedure which incorporates an inter-personal utility function or marginal utility multiplier which, they argue, enables cost benefit ratios to be weighted by a welfare index.

Similarly, Morris (1972,p.20) discussed a weighted objective decision theory as a "means of quantifying the social values which are to be considered in a facility location problem". An optimal decision may be reached, according to this method, on the basis of information on (a) the planning objectives, weighted in proportion to their relative

importance, (b) the alternatives which are feasible and (c) the probability that each alternative would attain the various objectives specified.

Morrill and Symons (1977) have considered the possibility that the most efficient method of achieving the required balance between conflicting objectives for the spatial organization of service may not be through facility location, but by compensating those individuals who are disadvantaged by long travel distances as a result of a solution which is most beneficial for the majority. Austin et al have proposed a decision model in the context of the problem of siting noxious facilities which incorporates the possibility of compensating minorities in this way. These authors gave the following explanation of the model:

> "If any population group opposes the location of the facility at site L, then additional costs may be required to implement the facility at L. If the organization is able to estimate these changes in expected costs it could again determine that site which minimized the overall expected costs of implementation. Moreover, even where negative impacts cannot be reduced directly it may be possible to 'compensate' local groups for these impacts by the addition of supplementary facilities or programs at L....we now designate all such modifications and additions to the main facility.. as auxilliary facilities at L. Hence we now assume that the organization can choose not only among site locations.....but may also choose among a finite number of possible facility packages at location L."
>
> (Austin et al.,1970,p.316-317)

In the context of siting health facilities, such a 'facility package' might comprise, for example, provision of additional public transport services to the selected site, serving those members of the service population for whom the chosen facility position was inaccessible. Such an approach implies an integrated approach to public service provision in which services produced by one sector may be used to promote the objectives of another sector in the most efficient manner.

CONCLUSIONS

Efficiency in achieving the goals of public service provision was recognized in Chapter 1 to be the principle on which decisions regarding public resource distribution should be based. It has been argued that the spatial accessibility of health facilities is one measure of the performance of National Health provision in meeting its objectives, and that it is therefore valuable to have available techniques for assessing the spatial efficiency of facility locations for the whole population they serve. Location-allocation solutions are potentially useful as tools for assessing health facility locations, since given certain assumptions, they permit analysis of the health system as a whole and will balance the demands of different areas. Where a trade-off must be made between different planning goals it may be possible to incorporate these into one solution. Otherwise, separate solutions can be derived to provide summaries of the ideal method of spatial organization to meet each objective. The solutions produced by location-allocation procedures can be used to suggest ways in which the overall health facility system might be made more efficient in terms of the criteria used, by relocating existing facilities. The location-allocation solution can also indicate efficient locations for new facilities, and might be applied for example, to the siting of health centres. Furthermore, the procedure has potential for assessing the distribution of service capacity between service centres, and the allocation of clients to facilities within the service area. The NORLOC location allocation procedure was applied in this study to obtain information about the distribution of doctor's surgery facilities in relation to the service population in the study area. It is demonstrated in Chapter 6 that this analysis yielded some useful indications of the way in which the spatial organization of general medical services was likely to affect travel distance for the population in general and for the elderly as a special group.

However, the arguments rehearsed here have also shown that this type of spatial analysis is based on a number of assumptions which limit its value in a study of spatial access to health care facilities. Also efficient planning solutions may require intervention directed at individuals in order to ensure that the objectives of social justice are met, and this entails a consideration of individual circumstances. The empirical work which focused on this latter aspect of spatial access to health facilities is reported in subsequent chapters which describe a survey made of elderly residents in Broadstairs and Whitstable.

PART II

EMPIRICAL ANALYSIS OF SPATIAL ACCESS TO PRIMARY HEALTH CARE FOR THE ELDERLY IN EAST KENT.

Chapter 6

SPATIAL ANALYSIS OF SURGERY POSITIONS IN THE CANTERBURY AND THANET HEALTH DISTRICT

The issues raised by the discussion in the first part of this thesis were investigated in an empirical study of spatial access to primary health care facilities for the elderly in part of East Kent. Of particular interest in this research was the question of access to doctors' surgeries. As explained in Chapter 2, spatial access to surgeries for clients was argued to be of special importance because of their function in providing services to a large proportion of the population,with a wide range of different health needs. The GP was considered to provide a key service in the primary health care system, through which access to more specialized services might be gained by referral.

The initial phase of the empirical research involved an analysis of the distribution of doctors' surgeries in relation to the general population,and to the elderly population. The analysis was intended to provide background information about the pattern of surgery locations in the study. The discussion in Chapter 2 described the techniques employed by the Family Practitioner Committee to ensure an equitable distribution of doctors between MPAs.It was also of interest in this chapter to compare the assessments of manpower distribution made by the FPC with the results from an alternative procedure based on the locational analysis.

The analysis concentrated especially on the comparisons which could be made between the towns of Broadstairs and Whitstable with respect to the distances to be travelled to obtain health care. The degree to which centralization of services in health centres would affect spatial accessibility of facilities in these towns was also an important concern. The analysis attempted to compare the distances to be travelled by elderly residents in the two towns with the travel 'costs' for the population in

general, as measured by the procedure used.

The discussion in Chapter 5 concerned the application of the location-allocation procedure to the study of primary health facility locations, and demonstrated that the procedure might be used as a test of the efficiency with which the distribution of facilities produced a socially desirable pattern of accessibility for the service population. Two aims were identified in establishing the socially desirable pattern of accessibility; to minimize the total travel cost for the service population as a whole, and to minimize the degree of inequitable variation in access to health care. Assuming that the cost of spatial access varies in relation to distance in a consistent manner for the whole population, and they also are homogeneous in their need for health care, it was possible to introduce different criteria into the model which each incorporate the two planning objectives to a varying extent. The following discussion illustrates the effect of applying these different criteria to the problem of the distribution of doctor's surgeries in East Kent. An attempt was also made to test the efficiency of the distribution of service capacity between the surgery facilities in the area.

If the population was considered to be heterogeneous in its need for health care, or in the effects of distance on accessibility, then it was necessary to weight individuals in the population differently. This chapter considers the effects on the results obtained of weighting the elderly population in a simple way to take account of their expected higher health needs and lower mobility, which have already been discussed in Chapter 4.

DATA USED FOR THE ANALYSIS

The data used for the following analyses was obtained from two main sources; the Population Census and the records of the Kent Family Practitioner Committee. The 1971 Population Census (OPCS, 1973 , Table 3)

yielded data on the distribution of the service population of the Canterbury and Thanet Health District. These data were in the form of numbers of people in urban wards and rural districts,obtained from the published Census reports. For Broadstairs and Whitstable, which were used for a more detailed study, the population of Enumeration Districts was obtained from the Census statistics for small areas held by the Planning Departments of the Canterbury and Thanet Councils. The distribution of the GP's surgeries was obtained from the register of the Kent Family Practitioner Committee (1974), with some amendments to allow for changes which have taken place in Whitstable and Broadstairs since the list was compiled. This Medical List shows the addresses of all the surgery premises at which GP's practised and surgery hours during which the doctors operate at these surgeries.

THE LOCATION - ALLOCATION PROGRAMME

Mention was made in Chapter 5 of the NORLOC programme for computing solutions to the location-allocation problem. This algorithm was designed by Nordbeck and Rystedt (1971) and has been adapted and prepared for use on the University of London Computer. The service area is represented for this procedure as a two dimensional grid matrix. The programme requires information on the number of facilities, their starting locations,and any facilities for which the location is to be fixed. Facility locations are expressed as grid coordinates. It is also necessary to supply the distribution of the service population, which is summarized as the number residing in each grid square of the matrix, and which is all atrributed to the centre of the grid square. The level of accuracy of the solutions will therefore depend partly upon the size of the grid cells used to divide the map of the service area, since the smaller the size of the square, the more detailed will be the representation of the population distribution.

The programme operates by an iterative process, shifting each facility in two dimensions. The size of the movement is fixed at the outset and becomes progressively smaller at each stage of the iteration cycle. After each shift, the procedure allocates each population cell to the nearest facility location,using Pythagorean distance as the measure of proximity, and the total cost is calculated of travel between each cell and the facility to which it is allocated. For each facility, the iterative process continues until a minimum value for the total cost is obtained. (This may be a local minimum - see Chapter 5).

The four criteria discussed in Chapter 5 were incorporated in turn into the analysis by making modifications to the formula used to calculate the spatial access cost to be minimized by the procedure. The formula corresponds to the basic form of the optimal partitioning criterion given in equation (8),Chapter 5. Various forms of this criterion were applied in order to generate solutions corresponding to the different types discussed in Chapter 5. The Point of Minimum Aggregate Travel was obtained by minimizing the simple aggregate distance measure. The Centre of Gravity was derived by minimizing the aggregate of travel distances squared; see Chapter 5, equation (12). The Area Centroid was generated by minimizing the aggregate of cubed travel distance, corresponding to the criterion in equation (11), Chapter 5. The procedure was also carried out using a criterion for measuring variance of travel cost of the form represented in equation (13), Chapter 5. The weighting procedure was implemented by making alterations to the sizes of the populations to be served in each of the grid squares.

ANALYSIS OF THE CANTERBURY AND THANET HEALTH DISTRICT

Location-allocation procedures incorporating these four criteria were used initially to examine the distribution of GP's surgeries in the Canterbury

and Thanet Health District. The population distribution of the District by rural parishes and urban wards, obtained from the Census Reports for Kent, was translated into a population grid map. The population of each area was allocated to that cell of the grid matrix corresponding to the location of the most densely populated part of the parish or ward. The size of the cells used was 1 square Km. The positions of GP's surgeries in 1974, obtained from the FPC Medical List, were used as the starting positions for the iterations. This was done so that the total cost of the final computed solution could be compared with the cost of the locations as they existed in 1974, assessed on the basis of the relevant criterion. Since 1974, there had been some changes in the number and the distribution of doctor's surgeries. However, at the time of the analysis, complete updated information of the current distribution was not available, so that these changes could not be accounted for in the data. Fifty two facility locations were included in the analysis, but where two or more surgeries were located so close together that it was difficult to distinguish them at the 1 Km. scale of the grid, they were represented as a single facility location.

The NORLOC programme was used to calculate the solutions to the allocation problem using the four different criteria and an iterative size starting at 1 km. The analysis also employed the facility of the programme which enables the positions of the surgeries to remain fixed without any iteration, and the optimal partitioning process to be carried out for these facility locations. This latter procedure showed how the population would have been allocated between the surgeries if all clients used their nearest surgery (within the shortest straight line distance), and the service capacity of each facility (in terms of total numbers to be served) which would be necessitated by such a pattern of allocation.

The solution generated by minimizing average distance is illustrated in Figure 6a, which shows the actual positions of the surgeries in 1974 and

the positions to which they were located in the optimal solution. Where the computed solution produced new locations for surgeries, the change in position is indicated by a vector of the type referred to in Chapter 4. The diagram shows that there weresome changes in the positions of the surgeries. New positions were produced mainly for those surgeries located in the urban fringe areas,which were decentralized further from the town centres, while most of the surgeries in rural areas and in town centres have remained in their original positions.

Table 6:1 shows the spatial access cost for the whole service population before and after the procedure had computed the positions of the optimal solution. The optimum and original costs may be compared in the form of a ratio,giving an indication of the reduction in spatial costs achieved by the procedure. For the MAT solution, the ratio of 1.33 shows that the actual surgery positions implied a total spatial access cost exceeding the hypothetical minimum by over 30%.

Figure 6:b illustrates the result produced using the Centre of Gravity criterion, which seemed to produce a similar distribution to that from the PMAT result. However, some facilities in rural areas which remained stationary under the PMAT criterion were relocated by the Centre of Gravity criterion. In Figure 6b the results of the analysis using the Area Centroid criterion show that this procedure tended to change the positions of more of the rural surgeries in isolated locations, moving them to sites which were more accessible for the dispersed rural population. Since the Area Centroid and minimum variance criteria both tend to produce solutions which reduce variation in access costs rather than overall cost, it was not surprising that the patterns generated by these two procedures were similar, as can be seen by comparison of Figures6c and 6d.

For each of the criteria considered, the total spatial access costs for the existing surgery positions and for the computed optimal locations

are represented in Table 6:1. The table shows that the computed spatial access costs of the actual surgery locations considerably exceeded those calculated for the hypothetical 'optimal' solutions. This indicates that there was potential for improvement of the spatial efficiency of the distribution of surgeries in achieving both the objective of minimization of average travel costs throughout the system, and the aim of minimization of variation between individuals. The fact that the positions of the facilities showed greatest movement when relocated under criteria which reduce variation between individuals suggests that the 1974 surgery distribution performed less efficiently with respect to this planning goal than it did in minimizing average travel distance overall. It is not possible to use the ratios represented in Table 6:1 to test this proposition since they are based on calculations of costs which employ power functions of distance. However, in the analyses of Broadstairs and Whitstable discussed in the following section, comparisons between the solutions were made in terms of the two planning objectives.

NORLOC was also run on the 1974 surgery distribution for the Health District to carry out the optimal partitioning procedure without any relocation of the surgery positions. The results from this analysis showed the numbers of people served by each facility (ie. the optimum capacity of each facility) if each member of the population were served by the nearest facility. An attempt was made to compare the capacity of the surgeries predicted by the optimal partitioning problem with the actual capacity of the surgeries in 1974. No information was available about the numbers of patients using each surgery, so a surrogate measure of capacity was used, based on the number of doctors providing general medical services at the facility, and the period of time during each week for which surgeries operated. The total was obtained for each facility of the number of hours each week for which every doctor held a surgery at that location. This measure, therefore, attempted to incorporate information on the variation

in the amount of medical care available between branch surgeries, used only periodically during the week,and main surgeries where the doctor conducted most of his work and wasavailable more frequently. If it is assumed that the total number of hours for which surgeries were held at a facility is proportional to the number of people which can be provided for at the facility, then the 'doctor.hours/week' measure can be used as a surrogate for capacity.In Tables 6:2a & 6:2b the total capacity provided in 1974 at all surgeries is shown for sub-areas within the Health District.Table 6:2a shows the total capacity of rural and urban local government districts, and in Table 6:2b the figures are given for Medical Practice Areas. Capacity for each sub-area has been expressed as a percentage of total surgery hours for the whole District. This percentage figure may be compared with the measure of optimum capacity provided by the computed solution to the optimal partitioning problem, also shown in the tables. The optimum capacity is represented as the percentage of the total population of the District who were allocated by the programme to facilities within each MPA.

Comparison of the two sets of percentage figures in Table 6:2g showed that in the two rural areas which were combined with an urban area within an MPA (ie,Swale and Bridge Blean) the percentage of surgery hours was lower than the computed percentage of capacity. However, in Eastry, which constituted an MPA alone, the two percentages were similar, indicating that the actual situation corresponded quite closely to the computed optimum. With the exceptions of Herne Bay and Whitstable, all the urban areas had actual percentages of total surgery hours capacity which exceeded the capacity computed by the NORLOC procedure.

In Table 6:2b, the same two sets of data are presented for the nine Medical Practice Areas in the Health District. The table also shows whether the percentage of total capacity of surgery hours available in the area was above or below the computed capacity. It can be seen that the

classification of the MPAs used by the FPC, on the basis of list size, did not correspond in any regular way to the results of the analysis indicating whether the MPA was 'overprovided' with capacity above the computed optimum, or 'under provided' with below optimal capacity. The inefficiency of the actual distribution of general medical services, therefore, seemed to be due not only to the position of facilities, but also to the distribution of capacity of the facilities. The changes implied by the computer solution in the capacity of the surgery locations seemed to reflect most strongly the existing concentration of surgeries in urban districts at the expense of the rural areas. In practice, of course, this means that the population of areas with a relatively poor provision of surgery facilities will travel to neighbouring areas, where there is an apparently high level of provision. Thus the areas shown in Table 6:2 to have a relatively low proportion of total surgery capacity are probably not in reality deprived of a GP's care, but they must travel further to attend a surgery than those living in areas where more surgery services are available.

The difference in spatial access costs implied by the existing pattern might be considered equitable if those in rural areas, with greater spatial access costs of reaching the nearest surgery, had less need of a doctor's care than those in urban areas for whom access costs were lower. Alternatively, if those with high access costs have similar, or higher ,needs than those with low access costs, they might be equitably compensated if GP's were more likely to provide home visits for patients living in more remote areas. (Nevertheless, the latter solution would be inefficient if the cost of remunerating GP's for home visits exceeded the costs of providing a branch surgery.) The implications in terms of territorial justice, and efficiency in achieving a socially just solution, cannot, therefore, be assessed without a study of the characteristics of clients and the organization of general practice.

The scale of the analysis at the Health District level was rather coarse and the urban-rural contrasts seemed likely to overshadow any more detailed variation which might be evident at the more local level. It was therefore decided to extend the analysis to examine the two urban Medical Practice Areas under special study here, in the towns of Broadstairs and Whitstable. At this more local level, it was possible to incorporate more accurate data on population distribution at the scale of the Enumeration District. Also, surgeries which were in close proximity to each other could be examined separately, rather than being represented as single facilities as in the Health District analysis.

ANALYSIS OF DOCTORS' SURGERIES IN BROADSTAIRS AND WHITSTABLE

As explained in Chapter 2, general practitioners' surgeries are provided using different types of facility in Broadstairs and Whitstable. The former town is currently served by the traditional style of doctor's surgery with a different premises for each practice or group practice. These are scattered throughout the town at nine different locations. In contrast, a single health centre serves the entire Medical Practice Area in Whitstable. It was therefore possible to compare the spatial access cost of the two systems in terms of the four criteria used.

For Whitstable, the FPC records provided information on the positions of doctors' surgeries as they had been before the health centre was established. The previous pattern of surgeries had been distributed throughout the town in five different locations. Thus, it was possible to employ the four different criteria in an analysis to find how the centralization of general practice at the centre had affected the spatial access costs of the system.

Similarly, in Broadstairs, a new health centre was planned for the town. Its position had already been decided and the implications of

relocating surgeries to the centre could be assessed in terms of the spatial access costs measured by the procedure. (This assumed that all the doctors in the area would transfer their surgeries to the new health centre. The validity of this assumption is not yet certain, but the indications are that most of the doctors will use the centre. It is not clear, however, whether surgeries at the present locations will also be continued, although it was assumed in the analysis that they would not.)

The results of the analysis therefore, enabled comparison of two different styles of organization of surgeries in the two Medical Practice Areas. The comparisons are made in terms of total spatial access cost for the population of the area, on the assumption that all of the residents will be registered with a GP within the MPA, and all clients will use the doctor whose surgery is the closest. Spatial access costs have been computed, using the four different criteria, for the actual surgery locations and the 'optimal' facility locations computed by the programme, and the results are shown in Tables 6:3 to 6:8. A comparison of the new locations generated using the different criteria was also made on the basis of the two aims of spatial efficiency considered here. Tables 6:3b and 6:6b show the spatial access costs, in terms of (a) distance to be travelled by the average individual and (b) the variance in distance travelled, for the population if it were to be served from the hypothetical surgery locations produced by iteration under the four different criteria. This was achieved by running the NORLOC procedure using the PMAT and Minimum Variance measures, with the facility positions fixed in the 'optimal' positions produced by previous analyses under each of the four cost criteria.

The relocation of surgeries produced by the location-allocation procedure using different criteria are also represented in Figures 6e to 6k which indicate the original locations, corresponding to actual past, present or future surgery positions in the two towns. The computed locations

for these surgeries are compared with the original positions by means of vectors which indicate the direction and distance of the relocation implied by the results.

The population of the Enumeration Districts in each town were obtained from 1971 census data and represented on a grid map with cells .25km^2 in size. For part of the analysis these data were weighted, giving old age pensioners twice the weight of other members of the population. This was done to discover the implications of surgery locations for the elderly,who have been identified as a group of clients with generally high need for health care and low mobility. The size of step for the facility iterations was set at 0.25km, so that a more accurate picture could be obtained than that from the analysis of the Health District.

Figures 6e - 6i illustrate the results produced from the NORLOC analysis of doctor's surgery locations in Broadstairs. The general pattern is for decentralization of the surgeries towards the outskirts of the town. As in the case of the results for the District, the pattern generated by the Area Centroid criterion is almost identical to that produced by the method which minimized individual variation, and the greatest degree of decentralization is evident in these solutions. A smaller degree of decentralization was produced by the procedure minimizing average travel distance.

The results in Figures 6e and 6g show the relocation produced when the NORLOC procedure was used for the proposed health centre site. The amount of movement involved is relatively small, suggesting that the proposed site is quite efficient in terms of the criteria used in the procedure. The data in Tables 6:3 and 6:4 show that if the entire population were served by the health centre rather than by the dispersed surgeries as at present, the average travel cost, as well as the variation in spatial access between individuals would be increased.

When the population was weighted to give more importance to the travel costs of the elderly, the computed 'optimal' positions for the surgeries were not significantly different from those produced by the analyses using unweighted population. The reduction in spatial efficiency calculated by the procedure were of the same order of magnitude as those produced for the unweighted population.

The analysis of the health centre in Whitstable produced the results shown in Figure 6j. The computed solutions for the Whitstable health centre had a tendency to relocate it in a position south east of its actual position, as though in response to two forces, one shifting it closer to the centre of the town and another towards the large numbers of residents in Tankerton and Swalecliffe to the East. Not surprisingly, in view of previous results, the new position was similar for the Area Centroid and Minimum Variance analyses, and procedures using these criteria produced the greatest movement of facility locations. The greatest disparities between the computed positions are between solutions generated using the PMAT and Minimum Variance criteria. The computed costs for the existing facility locations in Tables 6:3a and 6:6a indicate that, for the Whitstable population, the average distance to be travelled by clients to reach the health centre was longer than for the population of Broadstairs under the current system of dispersed surgeries. (The average 'cost' of distance to be travelled in Whitstable was calculated to be 13.9 units while in Broadstairs the average is 4.8 units). The journey to the health centre was also longer on average for Whitstable clients than the distance for the Broadstairs population to the site proposed for the planned health centre there. This was partly due to the fact that the Whitstable population was distributed over a wider area, and illustrates the point that the impact of centralizing facilities on spatial access costs will vary according to the geographical distribution of the population to be served. It is also interesting to note from Figures 6j, 6e and 6g that the

(text continues overleaf/...)

amount of relocation produced by the computed solutions was greater for the Whitstable centre than for the health centre in Broadstairs. These results suggested that,in terms of spatial access costs,the Broadstairs site was more efficient than that selected in Whitstable. It is perhaps significant that in Broadstairs two alternative locations were possible for the health centre, and the proposed site was chosen partly because it was thought to be more accessible. In Whitstable, on the other hand, less attention seems to have been paid to the question of accessibility. Conversation with voluntary workers in Whitstable revealed that it was not until after the health centre came into operation that it was found to be necessary to alter the bus service,in order to improve access to the health centre, which is located some distance from the centre of town.

The location-allocation results in Tables 6:3a and 6:7 indicate that the distance travelled to the doctor's surgery was longer on average in Whitstable than in Broadstairs even before the health centre was established. The previous system of five separate surgeries in Whitstable produced an average travel cost of 5.6 units as compared with 4.8 in Broadstairs. This is partly due to the greater dispersal of the population,and partly because there were only five surgery facilities in Whitstable compared with nine in Broadstairs. As would be expected, the old Whitstable surgery locations also implied greater individual variation in distance to be travelled by patients in order to reach the surgery from home.

The results obtained by weighting the population distribution according to the residential distribution of old age pensioners in Whitstable produced the same 'optimum' location for the health centre as that generated without weighting the population (Figure 6j). However, the average travel distance was slightly longer, which would seem to suggest that the distances to be travelled by the elderly may have been longer on average than for the rest of the population. (Table 6:6a and 6:8).

A final observation made from these results concerns the question of the nature of the trade-off between the two objectives of minimum average travel distance for the population as a whole, and minimum individual variation in spatial access costs. Tables 6:3 b and 6:6 b show the results obtained by executing the NORLOC procedure with fixed facility locations, using the PMAT and Minimum Variance criteria, to calculate total spatial access costs for the population of travel to the four sets of optimum locations (which had been generated by relocation of facilities under each of the four alternative criteria). There is no sound basis for comparing a unit of total travel distance with a unit of travel distance variance, and, therefore, it is not meaningful to state that "a reduction of x% in average travel costs produces a y% increase in individual variation." However, the following points emerge from a consideration of these results. One is that the PMAT solutions, while they were most efficient in terms of minimizing average spatial access costs, produced the greatest variation between individuals. The Centre of Gravity, Area Centroid and Minimum Variance criteria all produced solutions in which individual variation was considerably less than in the PMAT solution. As expected, the Area Centroid solution appeared to have reduced variation to a greater degree than the Centre of Gravity and was almost as effective as the Minimum Variance criterion in this respect. It was also anticipated that the Centre of Gravity procedure would be more effective in reducing the average travel distance than the Area Centroid or Minimum Variance solutions. However, the results obtained indicate that this was not necessarily the case. While all the three alternative criteria produced a smaller reduction in average travel cost than that generated by the PMAT solution, the Area Centroid and Minimum Variance analyses produced average travel costs which were similar to, and in one case slightly smaller than, that from the Centre of Gravity solution.

It would appear, therefore, that the two objectives of spatial efficiency, in terms of average travel cost and individual travel variation, may be represented using location-allocation procedures based on the PMAT cost criterion and the Area Centroid measure (which is more easily computed than the Minimum Variance criterion). To some extent these two objectives imply conflicting planning solutions. However, the results in Tables 6:3b and 6:6b also show that the PMAT solution not only reduced the average travel costs but also resulted in a lower level of variation between individuals than those calculated for the actual distribution of surgeries. Similarly, the Area Centroid method produced surgery positions for which the average travel distance would be lower for the population as a whole than that computed for the actual surgery positions. Thus either of these location-allocation procedures are likely to provide solutions to the facility distribution problem which would improve both of the two types of spatial efficiency considered in this analysis.

CONCLUSIONS

The distribution of GP's surgeries in the Canterbury and Thanet Health District was not the most efficient pattern for the promotion of the spatial access objectives considered here.

The distribution of surgeries at the level of the health district tended to result in an over-concentration of medical services in the centres of urban districts and a relative shortfall of provision in rural areas. The cost of access, measured in terms of average distance or distance variance, could have been improved by a relocation of surgeries towards the periphery of urban districts, and to more central positions in rural areas. A reorganization of the capacity of existing service locations would also have reduced total access costs and increased efficiency if all patients used their closest facility. Surgery services seemed to be concentrated at urban surgery

locations (for example, in Broadstairs) to a degree greater than the optimum distribution would allow, at the expense of rural areas, especially where a rural area was combined with an urban district within one MPA. Whitstable and Herne Bay, however, were exceptions in that the surgery hours available seem to be proportionately less than the service capacity predicted by the computed solution. These two towns may, therefore have had a relatively poor provision of general medical services compared with other urban areas. The techniques used to assess the distribution of services in the health district between MPAs suggested measures of provision of general medical care which might be complementary to the average list size criterion used by the FPC, since they placed emphasis on the distribution from the point of view of spatial access for the patient, rather than workload for the doctor. For example, a crude attempt was made in this experiment to classify areas into groups with 'above optimum' capacity, and groups with 'below optimum' capacity. Such a classification may suggest ways of improving the spatial accessibility of the system of general practices without actually providing additional services.

The analysis of the surgeries in Broadstairs and Whitstable permitted a more detailed study of the situation within the two urban districts of particular interest in this study. It was found that the costs of access to general health facilities, expressed as average distance and variation in distance to be travelled, were greater in Whitstable than in Broadstairs for two reasons. First, the mode of provision by a single health centre in Whitstable caused spatial access costs to be higher than in a system of more dispersed individual practice surgeries as in Broadstairs. Secondly, the population in Whitstable was more dispersed, and the areal extent of the MPA greater, and thus spatial access costs would be higher than in Broadstairs, even given the same number of facilities in each town. While the proposed health centre site at Broadstairs seemed to be quite

economic in terms of access costs, compared with computed 'optimal' location, the Whitstable health centre position seemed to be less economic in these terms than a hypothetical optimum site would be.

The weighting procedures used represented rather crudely the greater needs of the elderly for access to health care as compared with the population in general. However, the results discussed above seemed to indicate that the elderly were no more favoured by the present distribution of doctors' surgeries than the rest of the population, and in Whitstable the health centre location resulted in greater travel distances for the elderly than for others.

Throughout this discussion we have assumed that patients attend their nearest surgery location. However, the evidence from this investigation of surgery capacity in the Health District seemed to cast doubt on the validity of this assumption. A conclusive test would only be possible with data on individual clients, and without such evidence, the results of the solutions computed here should be treated as abstractions from real behaviour. As such, however, they do provide some insights into the spatial distribution of general medical services in the Health District, from the point of view of theoretical measures of access costs (assessed on the basis of the average cost to individuals and the degree of variation in cost one would expect to find between them).

The following chapters are concerned to test some of the postulates which suggested themselves in this analysis in respect of the spatial distribution of doctors' surgeries in relation to the population which they serve in the study area. The subsequent part of the thesis reports research which revealed more about the spatial behaviour of elderly clients in using primary health facilities, and the factors influencing their behaviour. This was achieved by means of a study of individuals in contrast with the analysis discussed in this chapter, which has been concerned with the service population as a whole.

CHAPTER 7

THE SURVEY OF ELDERLY RESPONDENTS

Knowledge of the way in which the elderly perceive the barriers of spatial inaccessibility is limited. Relatively little information is available about how far their perceptions relate to the existence of factors which, according to the arguments in Chapter 3, would be expected to affect their access to health care facilities. This chapter is concerned with the techniques which were used to investigate these issues in this research project.

It was evident that some form of survey of elderly people in the study area was necessary in order to collect the required empirical evidence to test the ideas developed in the preceding chapters. However, in the social sciences one is not generally able to provide evidence of relationships of straight-forward, cause and effect type between two variables, since "more often we deal with complex patterns of interacting variables" (Oppenheim, 1966, p.6) and one must, therefore, expect to find multiple relationships of several variables producing an observed variation in empirical data. This was clear from the discussion in Chapter 3, which would lead one to conclude, for example, that it would probably not be feasible to try to prove by empirical observation that distance of a patient's home from the doctor's surgery governs completely the ease of access to the doctor's care. However, it might be more useful to test the hypothesis that distance from a surgery is one of several factors influencing spatial access to primary health services and it might be possible to determine the relative importance of distance as compared with, for example, mode of transport or state of health.

Part of the information collected was therefore intended to be used for analysis using the hypothetico-deductive scientific approach described by Ryan as follows;

"...explanation requires the adducing of general laws, with the status of empirical hypotheses about the natural order, from which, in conjunction with statements of initial conditions, we can deductively infer statements about empirical consequences... the mode by which scientific enquiries proceed is by the testing and attempted falsification of empirical hypotheses."

(Ryan, 1970, p.46)

Such an approach required empirical data of a type which is measurable and comparable for all the individuals assessed. This is the type of information on which 'objective' normative judgements about need may be made by the 'minister' as explained in Chapter 1. This part of the research, therefore, assumed that an objective scientific approach might be applied to the study of the factors influencing perception of access to health care for the elderly, also that the evidence reviewed in Chapter 4 provided adequate grounds for the selection of those variables which seemed most likely to influence spatial access to health care for older people. This approach was based on the argument implied by most social science, that social phenomena can be meaningfully studied using methods which are basically scientific.

"The application of scientific method to the study of social-economic problems is based on the presupposition of the value of those truths which empirical knowledge alone can give us."

(Weber, 1949, p.110)

This thesis does not attempt to debate the philosophical question of the applicability of scientific method to social and economic subjects. Others have analysed this problem with greater authority and in greater depth than is possible here (eg. Nagel, 1957, Popper, 1959, Brown, 1963, Ryan, 1970) and the controversy continues. However, it does seem appropriate to point out some of the uses and limitations of the scientific approach to problems of the type considered here.

The hypothetico-deductive method provides a means of testing hypotheses empirically which is objective in that it follows a set of principles which

are generally recognized and widely used by social scientists and is thought to permit analysis which is relatively free of bias. Nevertheless, researchers in the social sciences should consider the values on which the scientific approach is based and the sort of explanation it provides, as well as paying attention to the empirical evidence and the theories which offer explanations. The value framework is important to the application of social science in the field of policy making and planning, since scientific methods do not enable one to validate or disprove the values upon which policies are based. The point was made forcibly by Weber,

> "The social sciences, which are strictly empirical sciences, are the least fitted to presume to save the individual the difficulty of making a choice, and they should therefore not create the impression that they can do so.
>
> An empirical science cannot tell anyone what he should do - but rather what he can do - and under certain circumstances - what he wishes to do."
>
> (Weber, 1949, p.18 and p.54)

This statement reiterates the conclusions reached in the discussion in Chapter 1, where it was argued that the aim of research should be to provide data to assist 'the Minister' to reach his decision, rather than to determine which policy must be selected. Thus, the fact that empirical evidence suggests that spatial accessibility <u>is</u> (or is not) important to ease of access to health care services has no influence over the fundamental judgement of whether health services <u>should</u> be made more readily accessible to patients. This is a matter for decision on philosophical, moral or ideological grounds and while such a decision may be considered to be <u>right</u>, there is no way of determining whether it is <u>true</u>.

The value framework within which the researcher works governs the way in which empirical material is collected. To quote Koestler,

> "...the collecting of data is a discriminating activity, like the picking of flowers and unlike the action of a lawn mower; and the selection of flowers considered worth picking, as well as their arrangement into a bouquet, are ultimately matters of personal taste."
>
> (Koestler, 1964, p.233)

In this survey the researcher has chosen, for reasons discussed in the preceding chapters to concentrate on spatial access to health care and factors thought to be relevant to this problem.

In policy orientated research, the approach taken by the researcher is also influenced by the values of the policy makers who might use the findings. Thus the 'objective' indicators of inadequate access to health care suggested in Chapter 4, such as distance to the facility, availability of transport and travel time were data collected because they were likely to be recognized by 'the minister' as valid measures of spatial access to health facilities.

The material collected for this study was therefore designed partly to discover whether the author's hypothesis of the likely characteristics of those elderly people most prone to experience difficulty due to spatial access could be corroborated by the empirical evidence. In this respect the approach would correspond to that proposed by Popper, who holds that theories are not verified but they can be corroborated;

> "Instead of discussing the 'probability' of a hypothesis we should try to assess what test, what trials, it has withstood; that is, we should try to assess how far it has been able to prove its fitness to survive by standing up to tests. In brief, we should try to assess how far it has been corroborated."
>
> (Popper, 1959, p.251)

The survey was also intended to provide an insight into the perceptions of a social group whose viewpoint was likely to differ from that of the investigator; to gain a clearer picture of the nature of the problem of spatial accessibility for the elderly and discover how it was viewed by the individuals themselves. This was to be achieved by collecting material of an individual kind, recording respondent's subjective perceptions and opinions. In contrast to the type of information already discussed, this material would be qualitative and not quantifiable in the same way as the 'objective' data on respondent's characteristics. The case for collecting

interview material of this kind is particularly strong in research which proposes to assess aspects of respondent's satisfaction with their circumstances, and it is supported by other authors engaged in similar work. For example, McKennell (1974) pointed out that the criteria of what is relevant for the measurement of satisfaction should be determined at least in part by the informant, not solely by the preconceptions of the questionnaire designer.

> "...if you want to know how people feel and think, it is necessary to take steps to listen to what they have to say."
>
> (McKennell,1974,p.49)

The qualitative material was also required to provide suggestions as to the possible causal links between the variables assessed. In Chapter 2, it was argued that it would be valuable to be able to predict by some indicator the likelihood of inadequacy of spatial access to health care for the elderly. As the understanding of the association between objective measures of spatial access to health care and perception of ease of access is incomplete, the development of such an indicator necessitates research into which, if any, of the objective factors are related to perceived spatial access. This research is therefore partly addressed to the question of how effective 'objective' measures are of the perceptions of respondents. D'Iribarne has also advocated such an approach to the development of indicators of subjective well-being.

> "For results that can be taken seriously, the need is still for work on the qualitative and 'semi-quantitative' analysis of the relationships between the physical characteristics of the situation (consumption of the various types of goods, environmental conditions etc.) and well being."
>
> (D'Iribarne,1974,p.41)

While this research was concerned to study and report the perceptions of the informants as far as possible, it cannot be argued that the interpretation of the responses was completely free of the effects of the

researcher's own view of the issues. It is doubtful whether any student of human behaviour and perceptions can adopt a completely impartial view of the subject matter. Indeed it may be undesirable to try to do so, since claims of neutrality are often questionable but very difficult to test and harder to assess in terms of their affects on the results of empirical analysis than are statements of the student's own view of the problem (Rein, 1976, p.85-87). It should be explained, therefore, that in collecting the qualitative material, the interviewer concentrated on those comments relating to spatial access to health care, and the subsequent analysis places greatest emphasis on these. Nevertheless, attempts were made to ensure that the questions asked, while directed mainly at experiences of spatial access to health care, did not prejudice the type of response likely to be elicited. The questionnaire design is discussed in detail below.

The selection of respondents was also governed by the type of elderly person likely to be of interest to this research. It was not the intention of the survey to obtain a sample of people representative of the elderly in general, but rather to study a randomly selected group of elderly respondents of a certain type who were thought to be particularly likely to be at risk of experiencing inadequate access to health care. The selection of interviewees is described in a separate section later in this chapter.

It was decided that it would be necessary to collect the opinions of elderly respondents using a survey method, rather than trying to infer their views from their behaviour in using health facilities, since as shown in Chapter 3, utilization might not be a clear indicator of ease of access. Sellitz et al. (1965,p.50) defined four broad groupings of research objectives:

1) to gain familiarity with a phenomenon or to achieve new insight into it, in order to formulate a more precise research problem or to develop hypotheses;

2) to portray accurately the characteristics of a particular individual, situation, or group;

3) to determine the frequency with which something occurs or with which it is associated with something else;

4) to test a hypothesis of a causal relationship between variables.

This study is concerned to some extent with all of these objectives since, as explained above, the aim was to explore the way in which the elderly view spatial access, and to discover whether variations in their views are associated with variation in other characteristics (although these associations might not correspond to direct causal relationships). It attempted to define what are the important characteristics which tend to differentiate those who perceive their spatial access to health care as inadequate from those who do not experience problems in this respect. The nature of the research influenced the type of survey used, and the choice of techniques for eliciting information. These issues are considered in the following discussion.

SELECTION OF THE SURVEY METHOD

There are two broad categories of surveys, the interview, involving face to face contact between researcher and respondent, and the questionnaire survey in which information is collected from respondents on a question sheet which can be completed without the presence of a researcher and which may be sent by post. The type of information which can best be collected by the two types of survey differs, and it is important to appreciate the characteristics of each method in planning a survey to collect a particular set of information.

In the case of this study the data required would include an account of the opinions and perceptions of the individuals involved which could not be collected as highly structured responses. As the respondents were to be elderly, problems were envisaged in asking them to fill out self-completion questionnaire forms, since reading and writing might be difficult

for some. Also, in the case of the less mobile, posting the questionnaire to return it might present difficulties. Furthermore, at least in the early stages of the survey, much of the collection of material would be of an exploratory nature.

It was therefore evident that an interview survey would be more appropriate than a postal questionnaire, since interviews permit greater flexibility in the collection of data and are suitable for use in studies where understanding of the subject is still being developed. Interview surveys have the additional advantages over questionnaires of being more suitable for those with reading or writing difficulties and of having a higher response rate, (Sellitz et al. 1965, Chapter 7; Goode and Hatt, 1952, Chapter 11).

The discussion in the following sections describes the techniques used for this interview survey. The importance of preliminary research to assist in planning a survey has been stressed by many authors and was particularly necessary in this case since the author had had little experience in conducting surveys. An initial pilot survey was therefore carried out as part of the process of setting up the main survey and proved very useful in modifying the survey techniques first envisaged to ensure that the data obtained was better suited to the requirements of the research. The adjustments made to the interview procedures as a result of the pilot survey findings are also described below.

SELECTION OF RESPONDENTS

The Pilot Survey

Obtaining respondents for the interview survey presented some problems because the individuals who were of particular interest to this study represented only a minority of the general population. In Chapter 4 it was argued that certain types of elderly person may be recognized by 'the

minister' as being most likely to experience a relatively high level of difficulty of access to local health facilities. Such individuals would most probably be aged 70 to 85 years and would mainly be women. They would mainly be single, or widowed and living alone, and would have a relatively low income. Those who do not drive a car are clearly more likely to have low mobility, as are those who have some difficulty walking. This study was not primarily concerned with elderly individuals who are housebound, since these would be unlikely to be expected to travel to facilities to obtain health care, and would more probably receive domicilliary care. The elderly people of interest to this study would have average, or above average medical need for health services.

The individuals displaying such characteristics would be a relatively small group compared with the population of the study area as a whole and probably only some of these would perceive spatial access to health care to be a problem. Thus a sample of the whole population would need to be very large to obtain a sufficient number of those of special interest to permit a study of their characteristics and views. Some method was therefore required of locating respondents who were most likely to have such characteristics and of sampling from these. The method generally used in large scale surveys to obtain a sample of respondents from a minority group within the population is to carry out an exploratory survey of a sufficiently large number of the general population to include an adequate number of the target group for the purposes of the study in question. (Hedges, 1977) For example, the national survey of elderly people reported by Hunt (1978) surveyed a large sample of the general population using a postal questionnaire to identify those households with elderly occupants and used these as the interview sample. However, in the case of this study, as already explained, it was anticipated that non-response to mailed questionnaires was most likely from the group which was of greatest interest in this research. Also, with the limited time and resources available for this

study such a procedure did not appear to be appropriate and an alternative source of suitable respondents was sought. Several possibilities were considered but rejected. For example it was not possible to use the G.P.'s practice lists held by the Family Practitioner Committee to obtain a sample of patients since the Committee wished to protect the privacy of patients. This source of respondents would also have the disadvantage of including only those using G.P.'s within the local Medical Practice Area. The possibility of sampling elderly people attending health facilities, such as the doctor's surgery was also rejected, since a sample obtained in this way was more likely to contain those using health care facilities frequently than those who rarely or never make use of such services. Furthermore, the interviewees might be shy of voicing criticisms they might have of the accessibility of health care while actually attending a facility and in the presence of health service personnel.

A recent attempt by the Age Concern Organization to distribute questionnaire forms through post offices, where elderly people collect their pensions, was unsuccessful since the Post Office was unable to cooperate with the exercise. Also, this method was considered unsuitable for the present study since it was necessary to conduct an interview rather than a mailed questionnaire survey. Residential homes for the elderly were also discounted as a possible source of interviewees, since those in homes represent only a small part of the population (3% is quoted in Abrams, 1977) and are likely to have more services in the form of special transport or domicilliary care at their disposal than the elderly population in general, which would reduce the incidence of spatial access difficulty.

The sources of respondents chosen were social day centres for elderly people which operate in several of the towns in East Kent. These are open to all elderly people and many are used as a centre for operations by welfare organizations concerned with the elderly such as Age Concern and the Women's Royal Voluntary Service. These centres provide a social centre

where a number of people can sit to talk or participate in activities, or obtain meals or light refreshments. Theyare attended by elderly people from throughout the towns where they are situated. Those attending were likely to spend some time at the centre, so would be available long enough for the interview to be carried out. It was decided that these day centres would provide the most suitable source of respondents for a pilot survey and the organizations concerned were very cooperative in allowing the author to carry out interviews with those visiting the centres. 38 respondents were selected randomly from those attending four different day centres located in Broadstairs, Whitstable, Canterbury and Margate on four days in December - January 1977.

It was not expected that the respondents would be entirely similar to the elderly population as a whole, since only a small proportion of elderly people use social centres of this sort. Hunt's (1978,p.103) study showed that only about 17% of the elderly over 65 attend such centres, and Abrams (1978, p.8) reports that only 13% of those over 75 do so. However, the sample would probably not be biased towards a group with a particular pattern of behaviour with respect to use of health care in the way that one might expect in a sample drawn from those attending particular health facilities. Furthermore, this source seemed likely to yield a relatively high proportion of people with characteristics corresponding to those of the'target group' within the elderly population which was likely to be of especial interest to this study. This expectation was supported by an analysis made of the pilot survey sample population which was carried out to discover how the socio-demographic, health and mobility characteristics of those interviewed compared with those one would expect to find in a representative sample of elderly people in general.

The data from the pilot survey was compared with information on the relevant characteristics for the general elderly population reported by

Hunt (1978), Abrams (1978) and Cartwright (1967). The pilot sample was found to include a relatively high proportion of women, and individuals aged between 70 and 90 years. The number living alone was also relatively large, while the number who were married with a spouse still living was smaller. Very few were car drivers and a smaller percentage of the women drove than in the general population. The number of male interviewees who drove was, however, higher than expected. It seemed that several of the men interviewed were visiting the centres during a shopping trip to town with their wives. It is, therefore, possible that the main reason for their presence was their role as car driver in the household. The number travelling by car to the doctor's surgery was, however, smaller than expected. The respondents appeared to be a group with rather higher than average use of general medical facilities.

Given the characteristics of the pilot sample which have been described, it was expected that a relatively high proportion would experience difficulty in travelling to primary health facilities such as the doctor's surgery. In fact, the proportion perceiving some form of difficulty was 20%, which was slightly higher than the proportion reported in previous studies (see chapter 4) but did not indicate a significant difference. It therefore seemed likely that respondents obtained from a sample of attenders at social centres for the elderly might include an average, or slightly higher than average proportion who experience access difficulties with respect to health services. It was also clear that to obtain a sufficiently large number of such respondents to permit reliable analysis it would be necessary to carry out a survey of at least 100 interviews which might be expected to yield 20 respondents reporting difficulty.

The Main Survey

As a result of these findings from the pilot survey it was decided to carry out an initial survey of 100 elderly respondents to be conducted at

the Whitstable Old People's Rest Centre and the Pierremont Old People's Day Centre in Broadstairs. The reasons for selecting the elderly residents of Broadstairs and Whitstable for special study have been mentioned in previous chapters. The two towns are similar in population size and are both seaside resorts favoured for retirement, with the same large proportion of elderly residents. As both towns are fairly small it is likely that residents from all parts of the town will attend the old people's day centres used as a source of respondents. The towns both represent complete Medical Practice Areas and have a similar designation, although, as the analysis in Chapter 6 showed, the provision of general medical services is dissimilar in terms of spatial accessibility. The organization of general practice in the two towns differs, with traditional individual surgeries persisting in Broadstairs (although soon to be superseded by a new health centre) while in Whitstable a single health centre had recently replaced the dispersed surgery system. The analysis using the location allocation model showed that the average distance travelled to the surgery would be greatest in Whitstable. The study, therefore, provided an opportunity to contrast two different forms of provision operating in rather similar towns.

The sample was obtained as before in the form of a random selection of those attending the centre. Interviews were conducted on different days of the week and at different times of day, so that the respondents should not include a disproportionate number of people attending the day centres for a particular activity or purpose which might attract a specific type of individual (for example, at Whitstable at certain times several of those attending were those using the voluntary minibus service, while at Broadstairs, certain afternoons were devoted to activities such as a sewing club). The interviews were collected over the period from June to July, 1978. As explained in the following section, refusal to be interviewed was very infrequent, in cases in which the selected interviewee refused to

participate they were replaced by another respondent present on that day.

Following the first phase of interviewing, for the main survey, the data obtained were analysed and it was decided that while collection of further survey material on certain factors was unlikely to be profitable, information was required on some other factors, particularly ease of access to facilities other than the doctor's surgery, and more detailed information on health status. It was also felt that it would be useful to obtain data about individuals who did not use social centres. A second phase of interviewing was therefore carried out in November to December 1978 in which a further 102 respondents were surveyed using a modified version of the interview schedule. Since previous interviewees had remained anonymous and could not be recontacted, a new sample of 52 respondents was obtained from the two day centres, in order to collect the additional data required for users of the centres.

Fifty interviews were also conducted with elderly people with whom the author was placed in contact by council wardens and voluntary social workers in Whitstable and Broadstairs. These were not a random sample, since the selection depended on the choice by the social workers concerned who were asked to provide a 'cross section' of the people for whom they were responsible, also respondents in more outlying locations were purposely requested to enable a more thorough investigation of those in less accessible residential locations. The locations from which the respondents were drawn were also affected by the position of the estate for which the wardens were responsible. Most of those interviewed were council tenants, so their social and economic characteristics may have been different from those of the population as a whole. The qualitative data obtained from these respondents, who were interviewed at home, was of particular interest. It provided further insights into the views and perceptions of the elderly and it included some interviews with people who were

housebound as well as those who were able to go out. However, the quantitative information had to be interpreted with reservations since the sample was not randomly selected and was, therefore, not strictly amenable to tests of statistical significance.

The preceding discussion has shown that the sample taken from the day centres should not be treated as an unbiased sample representing the entire elderly population. However, since several previous studies had yielded data about the elderly population as a whole, it was possible to make comparisons in order to establish how far those interviewed differ from the elderly population in general with respect of most of the social and demographic characteristics which are of interest in this study. Thereby it would be possible to keep a check on the degree of bias in these factors in the sample population. The pilot showed that the sample was likely to produce a random sample with a relatively high proportion of those in the 'target group' for whom spatial access to health care was an important factor and for whom difficulty due to spatial inaccessibility was most likely to be a problem. The final section of this chapter describes the social and demographic characteristics of the sample population, comparing them with 'averages' for more general elderly populations. However, attention will first be given to the questionnaire design.

CONSTRUCTION OF THE INTERVIEW SCHEDULE

The format of the interview schedule was determined by principles of questionnaire design discussed in the literature on survey techniques for use in social science (e.g. Oppenheim, 1966; Sellitz et al., 1965; Moser and Kalton, 1971). It was also necessary to take account of the special problems of interviewing the elderly when planning the questions. Little had been published on the subject of interviewing this particular group.

In consequence many of the features of the main survey questionnaire designed to deal with these specific aspects of the interviewees were introduced as a result of modification of the pilot schedule (Appendix 3a) in response to the discovery in the field of inadequacies in the question format. The second version of the schedule (Appendix 3b) was used for the first phase of 100 interviews in the main survey. Subsequent analysis of these data indicated that changes could profitably be made to the questionnaire for the second phase of the survey, incorporating some additional questions to elicit different information and omitting some less valuable questions. The final version of the questionnaire used, therefore, represented the most refined format, which was the most successful in terms of the ease with which it could be conducted and the level of success achieved in eliciting useful information.

The material collected in the interview survey was intended to provide two different types of data. First, information of a factual nature was required corresponding to those characteristics of the 'population at risk' which were identified in Chapter 4 as likely to be relevant to the question of spatial accessibility. These data were intended for comparison of individual respondents in the sample and also to compare the respondents as a group with the general elderly population using data from other surveys. For questions eliciting factual information, a limited amount of precoding was used to structure the data collected, but all of the questions were 'open' so that the range of likely responses could be explored. After familiarity with the most common replies had been developed in the course of conducting the pilot survey, a greater degree of precoding was possible for the recording of replies from the main survey.

The second type of information which was obtained in the survey concerned the perceptions and opinions of respondents regarding the accessibility of facilities. To obtain these data, open questions were used,

which it was hoped would elicit comments from the respondents which would give greater insight into whether they faced problems of spatial access and, if so, what were the circumstances apparent to them which caused them to experience these difficulties. Information was also required about the action spaces of the individuals interviewed and they were asked for an account of the location of certain facilities including primary health facilities and the journeys made to reach them.

Before considering in detail some aspects of the question design it is appropriate here to mention the methodological problems generally involved in using interview material as a source of data relating to the perceived world of respondents. The main difficulty arises from the fact that the interviewer and respondents each have different frames of reference. That is to say that their individually perceived view of the world varies. It is, therefore, impossible to assess how far the interviewer has understood and correctly recorded the perceptions of the respondent. This issue has been discussed by most authors writing on survey methodology, especially by Kahn and Cannell (1957, Chapter 2) who have summarized the psychological basis of the interview into 11 principles of motivation and perception. These were said to be related to the theory that human behaviour is directed towards goals and individuals are motivated to follow certain patterns of behaviour which they see as leading most easily to the attainment of these goals. Also, perceptions are of an idiosyncratic character which may be understood in terms of Lewin's theory of the psychological 'field' of the individual as discussed in Chapter 3.

The motives of the respondents might have biased their responses to some degree, and this element of bias represented one of the objects of particular interest to this study, which was concerned with variations in perceptions and opinions between elderly respondents. Motives, therefore, are given more detailed consideration here. The psychological basis of the

interview governs the degree and kind of motivation felt by the respondent with regard to the interview and the researcher conducting it. According to Kahn and Cannell, (1957, p.45,46),motivation within the interview may be extrinsic, represented by a desire to influence the interviewer, and through him the issues which are the subject of the survey, or intrinsic, resulting from the desire to communicate with the interviewer when the communication process itself provides some gratification to the respondent. Extrinsic motivation is likely to be stimulated if the respondent perceives that the interview is relevant to a change he desires, and that the interview is likely to have a role in bringing about that change. In this survey extrinsic motivation seemed most likely to enter into responses relating to whether or not spatial access was considered to be difficult, since those experiencing difficulty might feel that by reporting their problem they might be instrumental in improving their condition as a result of changes made to public services in response to the survey findings. It may be argued that since those who perceive themselves to have difficulty with respect to some service are more likely to be moved by extrinsic motivation than those who perceive their position to be adequate. The effects of this sort of motivation will not be likely to have a serious influence over whether or not a perceived difficulty is correctly reported, although it might affect the respondent's account of the magnitude of the problem. In order to reduce the probability ofexaggeration of perceived difficulty, no attempt was made to ask the respondent to grade the degree of ease or difficulty experienced with regard to spatial access to health care, and steps were taken to discourage this type of motivation. Care was taken to explain in the introduction that the interviewer was a 'student from the University' (rather than someone 'from the Council' or the 'Social Services' who might be expected to have some direct influence over the provision of services). In the main survey, the introduction made no mention of ease

or difficulty of access but was limited to a simple request for information about "how you get to health services if you need them".

Intrinsic motivation, on the other hand was considered to be an advantage, especially in the early stages of the survey, since it was likely to encourage respondents to give their opinions freely in response to the questions asked and also to supply additional comments to provide further insights into their experiences and perceptions. Intrinsic motivation was apparently high in general and was encouraged by the assistance of staff at the social centres by their cooperation in allowing the author to contact elderly people at the centre. The fact that the author was visibly accepted by the staff probably gave the interviewees greater confidence in replying to questions asked and offering their opinions and ideas. Many respondents welcomed the opportunity for a conversational style of interview with a stranger who displayed an interest in what they had to say. Non response was not a problem in this survey. Indeed in some cases a good deal of time was taken up in interviewing respondents who were all too willing to participate, but tended to wander somewhat from the issues of particular interest to this research into the realms of family history and similar topics.

The arrangement of questions in the questionnaire was designed to encourage intrinsic motivation by ensuring fairly easy movement from one subject to another in the manner suggested by Sellitz et al (1965, Appendix C, p.547). The open questions allowed for a relatively unstructured inquiry particularly in the early stages of the project, to produce responses in the style of a 'conversation with a purpose'.

A further issue in use of surveys in general is that of interviewer bias, which may influence the way in which responses are interpreted and recorded, and therefore could influence the findings obtained from an interview survey. Kahn and Cannell have hypothesised that various factors

are involved in the creation of personal biases in interviews. However, recent research indicated that the interviewer effect resulting from these sources of bias may not influence responses significantly when good interview practice is adhered to (Collins, 1978). Furthermore, the potential risk of this problem is reduced in a study such as this one in which all the interviews were conducted by one interviewer and any interviewer effects which may occur are at least likely to be consistent between respondents. Thus the variation between respondents due to interviewer bias, rather than variation due to the characteristics of the respondents themselves, would probably not arise. Also, it may be argued that having carried out the interviews herself the author was in a better position to assess possible sources of bias in the interview than a researcher who employs others to carry out interviews.

However, there remains the inevitable risk that the question may be misunderstood by the interviewee, or that the reply may be wrongly interpreted by the researcher, especially when the responses take the form of the expression of perceptions or opinions. Care must, therefore, be taken in the design of questions to reduce the likelihood of any misunderstanding on the part of the interviewee. The researcher also recorded responses verbatim in cases where there was the possibility that answers might be construed in different ways, so that the reader might make his or her own judgements about the way in which the answer was interpreted. The following section gives an account of the question design for this survey.

THE DESIGN OF QUESTIONS

The pilot questionnaire was designed for an interview which would be tape-recorded rather than for the interviewer to write down responses. This was necessary for the pilot survey in which the interviewer was not

able to predict the type of replies likely to be made and almost no pre-coding was possible. The tapes obtained in the interviews produced some valuable information. However, the time taken to transcribe the tapes was considerable and for the main survey, which involved a larger number of interviews, responses were recorded in writing. This was facilitated by the fact that the pilot survey provided the necessary data to enable the recording of responses to be organized using a certain amount of pre-coding especially for the more simple questions about the general characteristics of the respondents. The general form of the questions used for the interviews was fairly simple and as brief as possible, following the advice of Schmidt, who has suggested that when interviewing the 'old old',

> "Good instruments are short, varied, and clear, employing familiar terms whenever possible.....Some modifications may increase the usefulness of instruments without reducing the comparibility of findings."
>
> (Schmidt, 1975, p.545)

These guidelines are useful, particularly because a number of elderly respondents are hard of hearing and long and complex questions would not be readily understood. The form of the questions used also reflects to some extent the points made by Amelia Harris, (1979) who concluded that it is a mistake to make question format too different from normal conversational speech because this is likely to affect the way in which the informant replies. She also suggested that data gained in response to more general questions will probably be more reliable than replies to detailed enquiries about the frequency and timing of events.

As far as possible, therefore, long questions with elaborate qualifying phrases were avoided, since it was felt that what was gained in precision from this type of inquiry would be outweighed by the confusion created.

The first part of the interview schedule was concerned with information about the social, demographic and economic characteristics of the respondents, corresponding to the general socio-demographic factors in the

first section of Figure 4c, Chapter 4. Data was collected on sex, residential location, whether or not the respondent was registered with a National Health Service doctor, the availability of transport by car, household composition and marital status, socio-economic status and age.

No serious problems were encountered during the pilot survey in asking most of these questions. Respondents were quite willing on the whole to give this information about themselves and the questions provided a useful introduction to the subsequent sections of the interview, helping the respondents to accustom themselves to the interview and interviewer. Several became appreciably more relaxed on discovering that they were able to answer these questions quite easily. In the pilot survey, show cards were initially used for the questions on age and marital status since it had been suggested in some of the literature on question design that this might allieviate embarrassment, especially for women who were reluctant to admit to their age. However, these were not successful, since several respondents had difficulty in reading them, or did not understand how to use them. In most cases the show cards were in any case unnecessary, since many respondents took obvious pride in having attained a ripe old age, which seemed to increase in proportion to their years.

The part of the question on residential location which asked "Is that where you live all the time?", was designed to investigate whether respondents were permanent residents or temporary visitors to the area. It was misunderstood by a number of people, who seemed to interpret it to mean "Have you lived there all the time?" and responded by giving a history of the places in which they had lived. Clearly the idea of a temporary address did not accur to many, a frame of mind consistent, perhaps, with that to be expected of someone with little mobility. In the towns of East Kent a clear distinction is also made between those who are native to the area and those who have moved in from elsewhere, and for some respondents

the fact that they had not always lived in the area but had the status of relatively recent immigrants was obviously in their minds when replying to this question. This part of the question was omitted from later versions of the questionnaire.

The main difficulty in this section was in connection with collecting data on socio-economic status. The original form of the question was designed to elicit information which could be classified using the Registrar General's classification. However, as the vast majority of respondents were retired this question was difficult to administer and did not yield useful data since there is no sub-division of retired persons in the Registrar's system. In subsequent schedules the question was modified so that respondents might be classified on the basis of their previous occupation. Married women and widows who had not worked were asked for information about their husband's previous occupation which was used to classify their status. This enabled some comparison to be made with data from the national survey of "The Elderly at Home" which collected data on last previous occupation although this information was only obtained for those who had been in employment recently before retiring. Some attempt was also made to discover whether the respondent was entirely dependent on a state pension or whether he or she had some additional income from private pension schemes. However, this data was probably not a very accurate assessment of financial means. It was decided however, that to collect comprehensive data would involve more elaborate and searching questions which could not be accommodated, since it was necessary to economize on the length of questions in order to collect data on the required range of characteristics.

Questions were also included to elicit information about respondents' perceptions of the locations of selected facilities and an account of their travel behaviour to these facilities. This part of the questionnaire was designed to discover how much respondents knew about the location of health

facilities and how the location of health facilities related to the positions of other facilities which might be expected to figure for most of the sample population as key points in their action spaces (see chapter 3). Respondents were asked to locate the place where they went for weekly shopping, their nearest post office, nearest dispensing chemist, clinic (unspecified to investigate which were most familiar), the hospital casualty department and their doctor's surgery. Questions were also asked to discover how respondents viewed the relative positions of these facilities in terms of distance between each facility and their home. The interviewees were asked to estimate distance in linear measures and in terms of travel time. In addition to these verbal accounts an attempt was made to use diagrammatic and graphic methods of representation to investigate the way in which respondents perceived their action space. Respondents were asked to draw mental maps of the type used by Lynch (1960) and Gould and White (1974) and to use linear diagrams to represent distance in the manner utilized by Lowry (1973). However, it soon became evident that while verbal information was readily elicited, the respondents were not prepared to cooperate in using the graphic and diagrammatic techniques. Several had poor vision, and others had difficulty using a pencil, clearly , most were simply not prepared to engage in map drawing activities, and refused to participate as for example in the case of one lady who insisted that she "never was much at drawing".

These techniques were therefore abandoned during the pilot survey as being unsuitable for the group being interviewed, and it was decided to rely on verbal accounts which seemed more likely to provide useful material.

In the course of conducting the interviews certain facilities were found to be more important than others to the respondents. Most used shops and post offices, but the questions about the library were omitted in later interviews since few of those asked seemed to use this facility. Clinics for special types of care were frequently mentioned, so the pilot

was modified to investigate this type of utilization. In the main survey, an attempt was also made to discover how patients used hospital outpatient facilities and to distinguish between these and emergency casualty facilities. Several respondents spontaneously mentioned problems in obtaining chiropody treatment, so this was one of the health facilities included on the main survey questionnaire.

One of the aims of the pilot study was to discover which were the dimensions in which respondents viewed distance, to provide an understanding of the way in which the elderly may incorporate concepts of the friction of distance into their perceptions of accessibility of facilities. The majority were able to make estimates in terms of linear distance of time. Two respondents seemed to be able to give linear distance assessments most readily, however, 5 respondents when asked for estimates of distance in linear terms evaded the question by replying in terms of time taken to travel to the facility, and some gave verbal descriptions of the route taken, because they were unable to judge distance. In the main survey, therefore, travel time was taken as the measure of distance most easily grasped by the majority of respondents.

Information was also collected on the use made of facilities to discover whether respondents used the facilities mentioned and whether they used the nearest facility or another one further from their home. In the case of the general practitioner, data relating to the frequency of consultation, the site of consultation and the reason for the consultation were requested. These data were originally collected for comparison with data from the OPCS survey on morbidity (1974). In the second phase of the main survey, however, more comprehensive information about consultation behaviour was obtained employing questions used in previous national surveys. Questions in the schedule shown in Appendix 3c numbered giii; giii (a); giv; gvi; were adopted from the General Household Survey questionnaire, while question gvii is from Cartwright's survey of 'Patients and Their Doctors'. Data

were also collected for the second phase of interviews about the respondents' perceived health status and whether they experienced any disability or handicap due to ill health. These questions were taken from Hunt's survey of the 'Elderly at Home'. These questions from other surveys incorporated in the final version of the schedule were chosen because comparable data for the elderly was available from the reports of the original studies. Thus it would be possible to determine how the health and health care seeking behaviour of those interviewed compared with elderly people in general. As there was a choice to be made between different questions which could have been used for this purpose, the selection of questions was also governed by the style of the questions. Those which were fairly concise and simple in structure were preferred. Two questions on the frequency of consultation were used. The first, taken from the General Household Survey, (1976), asked about use in the preceding 2 weeks. However, the question about consultation over the year, taken from Cartwright's study, was also included to provide a check as to how typical the preceding 2 week period was of the individual's use of health services in general.

Questions on the percieved ease or difficulty of access were also included to discover whether or not the respondent experienced difficulties due to spatial inaccessibility of facilities. The interviewer was offered alternative judgements since the response might have been biased if respondents had been simply asked if access was difficult. The use of semantic differential scales to measure satisfaction was considered, but rejected since it was thought that these might not be readily understood by some elderly respondents and might therefore be unreliable.

In the pilot survey a question was also included asking whether the respondent would prefer the surgery to be elsewhere (question 23, Appendix 3a). Although some interesting replies were elicited, the response to this question was rather poor. This was partly because interviewees

found it difficult to make judgements on the basis of hypothetical alternative locations, and also because the notion of an alternative surgery location was interpreted by several to mean an alternative doctor, which was an unacceptable proposition for many people with strong feelings of loyalty to their doctor. Analysis of responses from the first phase of interviews also suggested that more information should be obtained about access to chemists, chiropodists and hospital outpatient services. In the main interview schedule, used for the second phase of interviewing, Appendix 3c , additional questions were, therefore, included to investigate more fully respondents' satisfaction with other specific health services in addition to the doctor's surgery, and a prompt was used where necessary to encourage those interviewed to explain why difficulties were reported.

The development of the interview schedule between the different phases of the survey therefore reflects not only the author's improved expertise in interviewing elderly respondents, but also a growing understanding of the problems and relevant issues involved in the question of access to health services for the elderly. This resulted from the lessons learned from the collection and analysis of the interview material while the survey was being conducted.

THE CHARACTERISTICS OF THE RESPONDENTS; THE SURVEY POPULATION COMPARED WITH THE ELDERLY POPULATION IN GENERAL.

As already explained, it was expected that the population of elderly people sampled from day centres in Whitstable and Broadstairs would differ in some respects from the general population of elderly people in Britain as a whole, and from that of the two towns from which the samples were drawn. Since some of the differences would affect variables likely to influence access to health services, it was interesting to discover how the sample population differed from these larger populations. The following

analysis compared the characteristics of the survey sample taken from the old people's day centres with data from Hunt's (1978) report of the survey of The Elderly at Home, the OPCS survey of morbidity (1974, Census returns from 1971, the General Household Survey for 1976, and Cartwright's study (1967) of Patients and their Doctors.

Demographic and Social Characteristics

The age distribution was compared with that which would have been expected in a representative sample in the two towns (as indicated by the 1971 Census) and with the results of the national sample of the elderly used by Hunt. The results, shown in Table 7:1 indicated that the respondents as a group were older than the average elderly population. In particular there was a concentration of individuals in the 70-79 age group which represented a significant difference from the general populations from which the respondents were drawn. In Broadstairs, there was also a significantly greater proportion of women than one would expect in a 'representative' sample, even allowing for the age structure (Tables 7:2 & 7:3).

It seems clear from Tables 7:1 - 7:4 that, especially in the sample from Broadstairs, the survey population included an unusually high proportion of women in the 'old old' age group of people aged 70 or more. It is possible that very elderly women are especially likely to use the day centres because a higher proportion live alone than among younger women and they therefore have a greater need for the social contact which the centres provide. Even allowing for the age and sex distribution in the sample, the number who live alone was significantly higher than expected in both towns and especially in Broadstairs (Table 7:5). There were also significantly fewer married respondents in the sample from Broadstairs than expected from Hunt's data (Table 7:6), and in Whitstable there were rather fewer than expected, although the difference was not significant.

Since the sample population differed in demographic structure from

the general population of the elderly represented in the national surveys, this has been taken into account in the subsequent tables, which include adjustments in the 'expected' figures for the age and sex composition of the sample.

Table 7:7 shows the social class distribution of respondents from the day centres. The data from the Hunt survey was used to estimate the proportions which might be expected, given the sex, marital status and employment history of the respondents. The 17 socio-economic groups given by Hunt were converted to the 6 social class groupings defined by the Registrar General using a conversion system devised by Bebbington (1978, Appendix 1). As explained above, the social class classification used was not considered to be very satisfactory, and the results from this measure are to be treated with caution. However, Table 7:7 suggests that the respondents included more in social class III than expected, while in Whitstable there was a higher than expected number in class III non manual. In both towns there were fewer than expected in class IV and more in class V, especially in Whitstable. It seems possible that the elderly people interviewed in both towns were on the whole rather higher in social class than average.

Residential Location and Time Travelled to Facilities

The residential location of the respondents was analysed by wards to discover to what extent the distribution of their homes was representative of the distribution of elderly people in the two towns. The information was obtained from the Small Area Statistics from 1971, which include data on the proportion of the population who are of pensionable age in all wards and enumeration districts. This was used to discover what proportion of the pensionable population lived in each ward. Table 7:8 shows that all the wards in Broadstairs are represented although the ward of Pierremont, within which the day centre is situated was over-represented, probably

because the day centre draws the highest proportion of its attenders from the area in closest proximity. In Whitstable, on the other hand, the more distant wards were over-represented (South, Seasalter and Chestfield), while the wards closer to the centre, particularly Tankerton, were under-represented. There were also slightly fewer elderly people from Swalecliffe than might be expected, since the highest proportion of those of pensionable age live there. The differences may have been due to the fact that the day centre was popular among elderly people who had come to the town centre for shopping or similar activities, especially those from more outlying areas who often came to the centre to rest or wait for a bus before the return journey. Some of those interviewed also attended the day centre because they used the minibus service which generally operated from the day centre and served the more outlying areas primarily. All the wards in Whitstable were represented, however.

Mobility Characteristics

Comparisons were made between the sample population and the general elderly population represented by Hunt's survey with respect to the proportion who drive a car, the number who have a lift available, the number with concessionary fare cards, and the number who reported physical handicaps which would be likely to limit their capacity for walking.

Table 7:9 shows that the number of car drivers in the sample was less than the results from Hunt's survey would predict given the age and sex of the respondents and the fact that both towns would be classed as retirement areas. The numbers of car drivers are in any case very small; in both samples less than 7% drove a car.

The availability of lifts was more difficult to compare since the data from Hunt's survey distinguishes between those people with no household car who are taken out by another person in a car at least once a

fortnight, and those who are taken out less often or not at all. The data for the East Kent samples distinguished between those who had no lift, or could only obtain a lift in emergencies, and those who said they were able to obtain a lift if they needed to get somewhere by car. The data are not, therefore, strictly comparable. However, the figures presented in Table 7:10 did suggest that the availability of lifts was lower than would be expected.

Table 7:11 shows the numbers who reported that they experienced difficulty in walking, compared with the figures predicted on the basis of Hunt's survey data for the numbers who 'can't walk fast or far'. Considered as a whole, the proportion for both samples was rather larger than one might expect, suggesting that the sample population as a group suffered particular physical difficulty in walking. (These data were only available for those from the day centre who were interviewed in the second phase of the survey, so that the numbers involved were from a total sample comprising 26 respondents from each town).

Ownership of a telephone

Having a telephone may make it easier for elderly people to overcome the problems resulting from travel to the doctor's surgery, especially for the purposes of ordering repeat prescriptions, or making surgery appointments, although owning a phone would not affect the degree of difficulty experienced in actually travelling to the surgery. The proportion of respondents who did not own a telephone was significantly lower than that which one might expect from Hunt's survey, given the household composition reported by the respondents, (Table 7:12). This relatively high rate of telephone ownership may account for the evidence discussed in the following chapter that some of those without a telephone considered themselves to be relatively deprived in comparison with other

elderly people.

Incidence of disability

The previous discussion has already shown that difficulty in walking due to physical handicap was higher than expected. However, the proportion who reported that they had no disability whatever was also higher than expected. This may have been because some respondents who said that they had a disability, but that this did not handicap them in any particular way, were recorded as having no disability, (Table 7:13).

Use of Primary Health Services

The use made of primary health services provided by a general practitioner appears to be relatively high amongst the respondents. The numbers consulting in the previous year are significantly higher than one might expect on the basis of the OPCS data (Table 7:14). Also, compared with the data collected by Cartwright (Table 7:15) there seem to be relatively fewer respondents who had made no consultations in the previous year. This seemed to be due to a relatively large proportion making between 1 and 4 consultations during the year, rather than greater numbers making calls upon the doctor's time more than five times in the year. The estimated average number of consultations per person per year was also found to be higher than that which might be expected from data reported in the results of the General Household Survey (Table 7:16).

The respondents therefore comprised a sample population which, compared with one which would accurately represent the elderly generally, included a rather high proportion of women, of those who are in the older age ranges, especially in their seventies, and of single or widowed people living alone. The opportunity for car transport also seemed to be more limited than is average for the elderly population as a whole.

The elderly people interviewed appeared to have a slightly lower than expected incidence of physical handicaps or illnesses which affect their activities. However, they made rather more use of their doctor throughout the year than one might have expected, apparently due to a higher than average tendency for occasional consultations rather than for very frequent consultation.

The sample population therefore included a relatively high proportion of those with characteristics which corresponed to those of the 'target group' of elderly people who could be recognized in 'objective' terms to be likely to experience difficulties of spatial access to health care. The analysis discussed in the following chapters was designed to discover how the interviewees perceived spatial access problems, and to investigate what factors determined their perceptions.

CHAPTER 8

THE SURVEY RESULTS : ANALYSIS OF THE VIEWS OF INDIVIDUAL RESPONDENTS

This chapter is concerned with the opinions and perceptions of individual respondents which were recorded in the course of the interview survey. Analysis of this material provided evidence relating to themes which illuminated the questions of perception of space and use of public services by the elderly. Some of these themes have been introduced in previous chapters which addressed issues involved in provision and use of public services, especially in Chapters 1 and 3. In this chapter they are re-considered in the context of the experiences of elderly people, as they were described by respondents themselves. Before discussing the nature of the material reported here, it is therefore appropriate to elaborate on the themes which run through the analysis.

Six main issues recurred in the comments made by interviewees, and were useful in interpreting their responses. One of these was the concept of relative deprivation, which was discussed in Chapter 1. A second theme illustrated by this study of respondents' mental images was the nature of their routine geographical experience. The results of this survey lent some support to the conclusions reached by Rowles on this subject, as reported in Chapter 3 . The question of residential mobility also appeared to be relevant to the perceptions of the respondents. The concept of free choice of residential location postulated by Tiebout, and discussed in Chapter 3 was contradicted by some of the material considered here.

The comments of respondents revealed for some respondents a lack of adjustment to their circumstances which might be partly attributable to a failure to plan for retirement. Schooler (1976) has suggested that evidence from surveys of elderly people who have undergone residential relocation,

for example, on retirement or removal to nursing homes, highlights 'two facets' of environmental change which he defined as mobility and changes in the attributes of environment. Schooler concluded that success in adapting to changes in the environment depends on 'competence', the capacity of the individual to adapt, and the 'environmental press' created by forces in the new environment which give rise to need. A fourth theme important to the material described here was therefore the problem of adjustment to environmental change for the elderly.

The alarms raised in this discussion concerning the possible difficulties resulting from poor retirement planning echo those sounded by Karn (1977 a & b) in her investigation of elderly people 'retiring to the seaside'. Karn also pointed out the difficulties of service provision in retirement towns. The material considered in this chapter drew attention to some of these difficulties, showing that not all elderly people are satisfied with the mode of provision of health care and some find health facilities inaccessible. The need to coordinate health facility and transport planning is also emphasised in the discussion.

A related issue relevant to the analysis of respondents'perceptions was that of the quality of life for the elderly. Two principal theories have been proposed to explain the life experiences of the elderly and they have often been presented as contradictory and opposing theories. One of these, the 'activity' theory of aging, holds that as they grow old, people retain similar psychological and social needs to those experienced in middle age (Havighurst, 1968) and that the continuation in self enhancing roles and participation in interests and activities are as necessary to a high quality of life for the elderly as for younger prople.

An apparently different view of aging is represented by the 'disengagement' theory postulated by Cumming and Henry (1961) and supported by authors such as Taietz and Larson (1956) and Tissue (1968). According to this

hypothesis, participation in activities associated with the elderly person's role as a member of society becomes less important to psychological well-being and the elderly person will become more preoccupied with him - or her - self. Withdrawal from social participation would be expected to be associated with successful adjustment to old age and relatively high life satisfaction.

In fact, as several authors have pointed out (Cumming, 1963; Knapp, 1977), the two theories incorporate different perspectives on aging and should not be viewed as contradictory. The important element, which appears to be significant to both theories, and must indeed be relevant to all consideration of life satisfaction, is the degree to which the individual perceives his way of life to correspond to that which is desired. This interpretation is similar to the concept of relative deprivation, and the material discussed below showed that for some people, problems of restricted mobility cause them some feelings of dissatisfaction with their life experience in retirement.

THE NATURE OF THE QUALITATIVE MATERIAL

The analysis reported here was related to the replies made by individual respondents, and the views expressed do not necessarily represent the opinions of the majority of those interviewed. However, several of the points discussed were raised by a number of respondents independently and the comments considered here were drawn from the records of over 100 different interviews. In some cases the most revealing comments have been quoted to exemplify points which were also expressed by other respondents. The significant parts of the interviewees' responses are quoted verbatim in this chapter, to illustrate the nature of the material and the way in which the author has interpreted it. This was necessary, since, as explained in the preceding chapter, an element of subjectivity must be involved in using the words of others to discover their perceptions. While the author has tried to remain impartial, the aim of recording these replies was to

enable the interviewer to enter into,and to gain a better understanding of, the problem being studied as it was viewed by those interviewed.

The views of the respondents were of interest because they reflect the opinions of a group representing several different dimensions of the East Kent population. The interviewees represented elderly people of a particular type who were also members of a particular community and could be identified within the general population in terms of their geographical location. They could also be distinguished as a group of public service consumers who had relatively little expertise in the provision of these services, but had a considerable experience of using them. Furthermore the material which is reported in the following discussion was of value because it illuminated different aspects of the problems addressed by this thesis. First, it demonstrated some of the issues which were appreciated by the respondents to be most relevant with respect to spatial accessibility of public services. Many of the replies quoted took the form of explanations or comments given spontaneously and more or less unexpectedly, expressing ideas brought to the minds of the respondents by the interview questions. The material also illustrated the nature of the perceptions held and the level of satisfaction experienced by the respondents relating to the issues raised in the interview. Finally, the reasons for the perceptions held by the respondents, and for the degree of satisfaction with which they view their circumstances, were indicated by their comments. Some hints were provided of the types of experiences which mould respondents' opinions and the frame of reference within which their ideas were set. The following discussion is therefore intended to elucidate the relevant aspects of the problems of access to health services as it affected the respondents, to describe their perceptions of the problem, and to make some progress towards understanding some of the reasons for their perceptions, in terms of the themes reviewed in the introduction to this chapter. The location plan in Figures 8a and 8b illustrate the places mentioned in the following discussion.

The material is presented here in three sections. The first deals with the costs of travel, showing the variations in the way the friction of distance was perceived and the feelings of relative deprivation experienced by respondents having to bear these costs. The second section is concerned with the restrictions imposed on the geographical experience of the elderly and the problems of adjustment to, and planning for, old age. The final section discusses comments revealing respondents' perceptions of spatial access to health care and raises the questions of the mode of provision of primary health care for the elderly, and the importance of coordinated planning for public services.

THE COSTS OF TRAVEL : INCREASING FRICTION OF DISTANCE FOR THE ELDERLY

One of the most striking general points arising from the analysis of the interview material was the great variety of views and circumstances encountered among those interviewed. The respondents included, for example, people who were relatively mobile and others whose mobility was severely restricted; those who were healthy and required little in the way of health care, and those who were frail or sick or suffered from chronic conditions requiring frequent medical attention; some who seemed satisfied with their circumstances and some who were not. It is also probably the case that individuals varied in their attitudes to life and their capacity to cope with difficulties. This point was expressed by a lady of 84 years of age who was involved in some voluntary social work for other elderly people;

> "There are those that take a positive view of life and enjoy what is to be had....and there are others who see what they haven't got and dwell on those."

Some of the variation in levels of satisfaction and propensity to perceive difficulties may have resulted from these differences in attitude. However, it was also clear from conversation in the interviews that circumstances differed to such a large degree between individuals that a situation which was satisfactory for one might present difficulties for

another which would be unacceptable by any reasonable standards. The survey data therefore indicated that from the point of view of needs for transport and spatial access the elderly should not be viewed as a homogeneous group. The level of mobility and ability to use transport modes varied between individuals, and it is likely that the level of intervention which would have been required to achieve a reasonable degree of access to service facilities, and the form such intervention should take, also differed.

This variation is clearly illustrated by the differences in the physical ability of the respondents to walk. For some respondents, walking did not present difficulties, and several viewed it as an enjoyable and healthy activity. For example, one respondent interviewed in Broadstairs, who looked remarkably agile for her 81 years, took some pride in explaining that she was in the habit of walking to Margate although it took her three quarters of an hour, and was a journey of at least one mile. Another respondent, aged 71, reported that she walked to Ramsgate from her home in Broadstairs. The following comments, made by two other respondents aged 83 and 72, also indicate that for them, walking was not a problem;

"I love walking. I don't use the buses much."

"I like to walk."

By contrast several other respondents had infirmities or disabilities which made walking any distance much more difficult. Those with arthritic and rheumatic complaints were particularly prone to walking difficulty and some suffering from heart disease and bronchitic conditions also had difficulty, especially in cold or windy weather. The following comments were typical;

"Sometimes I can hardly walk."

"I haven't the strength, I can't walk far."

"I can manage, but my legs are getting worse."

Apart from those whose disabilities made them housebound, those with walking difficulty were often reliant on public or private transport for

their mobility. However, for some respondents, using buses presented a greater problem than walking, usually because of the difficulty of boarding a bus. One respondent from Broadstairs explained that she was unable to climb into a bus without help and was reluctant to ask for assistance from strangers. Another interviewee suffering from arthritis and anaemia stated, that she "can't get on a bus"; a third, who has two 'steel hips' explained, "I can't put my legs up on a bus; the step is too high."

Among those who were able to make use of public transport by bus, a large number seemed to be dissatisfied with the service provided. Indeed, the bus service seemed to be the subject of more complaints than any other single issue in both Broadstairs and Whitstable. One of the problems, especially in parts of Whitstable appeared to be the infrequency or unreliability of the service, as indicated by these remarks from respondents living in the Grimshill Estate, Tankerton, Dargate and Yorkletts.

> "There's only one bus in the morning....they have taken off the buses."
>
> "Only one bus runs down and one back. Its a terrible service."
>
> "The transport in our area is shocking. There's a three hour wait for a bus home in the morning and after 6.00 you're shut in. There are no buses on Sunday."
>
> "There's only one bus in the morning. They don't come back any more. You've either got to walk back or take a taxi. That costs 60 or 70 pence."
>
> "I think the buses could be better. I don't think they run enough buses...If you wanted an evening out you could get there, but you couldn't get home, not unless you got a taxi. That doesn't always work out on pensions."
>
> "You've got to fit everything in with the bus.... We're most difficult out here for transport really."

In the case of Dargate and Yorkletts, the reported difficulties of inadequate bus services were not surprising since these are small communities in outlying parts of the district, several miles from the town centre. However, it was interesting to note the particularly poor service to the Grimshill council estate where a number of elderly people are resident and which is quite close to the centre of town. However, the estate lies a

quarter of a mile or more from the main bus route and is not served by a regular bus service round the estate itself. There were a number of respondents living in this area who experienced difficulty in travelling the relatively short distance from the estate to Whitstable for various services.

The quotes above show how some respondents felt their activities were restricted by constraints on their movements imposed by bus services, a point which will be discussed in more detail below.

Another problem associated with bus transport, which was frequently mentioned in Broadstairs and Whitstable was the cost of bus fares which seemed to be almost universally considered too high, and in some cases prohibitive, particularly for elderly people with limited incomes.

> "The bus fares are terrible. They don't give you anything. They should help the old 'uns a bit more, especially if you're over 80."

> "I think it's awful. It's only five miles from our place to the Rest Centre. No, it's less than that - four miles. And the cost - forty pence - does seem a lot for a single journey."

> "I don't go on the buses if I can help it. Bus fares cost money. We can't afford them."

> "I think we're going to get some help with the bus fares, so that we can get out a bit more."

Concessionary fare cards for those of pensionable age had been obtained by a majority of the respondents. However, a significant minority of those interviewed had not purchased a card. Many of these felt that the expense of the fare card was not justified by the small saving which it permitted on the cost of the bus fares. Interviewees were asked;

"Do you have a concessionary fare card for the bus?"

The response included the following comments, which seemed to be quite typical of a commonly held view in both Broadstairs and Whitstable among those not taking advantage of the concession.

"No, I wouldn't waste fifty pence on it for only 2 pence off."

"No, I haven't bothered because it was only two pence off the fare, and I didn't think it was worth it."

"No, you just get four pence off, that's all."

"They give you a bus ticket which can get you tuppence off your fare. That's an insult to me. I didn't apply for one."

"It's not really worth having a concessionary ticket because we come down once a week. I mean its going to take you a year to pay off what you paid for the concessionary ticket. So we don't bother. Maybe for people who come down two or three times a week it may help a little."

"I don't, no. We don't use the bus enough, you see."

"No, if you have one of them you have to pay fifty pence. You have to make fifty journeys to get that back."

In some cases, the diseconomies of the concessionary fare card have been exaggerated, in respondents' minds, judging by some of these comments. However, the general impression gained was that the concessionary fare scheme did not seem to be enabling the respondents to make savings on bus fares which they considered to be significant. One reason why the scheme was not universally accepted as desirable seemed to be the fact that those living in Broadstairs and Whitstable considered themselves to be poorly treated with respect to bus fares in comparison with old age pensioners in other areas, particularly Londoners who are entitled to free bus travel. Several of those interviewed had previously lived in London before moving to East Kent. Broadstairs especially was popular as a holiday resort for elderly Londoners, so that many interviewees had had some contact with people of a similar age from other parts of the South East, and clearly felt that their own position did not compare favourably. Furthermore, there was a belief that in paying bus fares the local people were subsidizing other elderly people from areas where free bus passes are issued.

"I think we should have free bus fares like the Londoners do."

"I don't go farther than Broadstairs because of the bus fares. It's unfair; everybody should pay half."

Those who were dissatisfied seemed to have little appreciation of the

difficulty of subsidizing reduced fares schemes for the elderly in an area where a large proportion of the population would be eligible for benefit, and bus use by passengers paying ordinary fares is inadequate to support concessions. One respondent did seem to appreciate the difficulty for the bus company of reducing fares.

"We would like some cheaper fares - but they can't do it, can they."

However, in most cases, respondents wanting cheaper fares looked to local government for funds. One interviewee said she had written a letter to her local councillor about the bus fares, feeling that if the council could pay councillors' expenses, it should be able to afford to reduce fares for the elderly.

The concept of 'relative deprivation' therefore, seemed to be useful in explaining some of the views expressed about costs of bus fares. Those who were particularly disatisfied with the cost of fares in this case were those who viewed themselves as members of a group who, by virtue of their age, low income, frailty and other characteristics, merited differential treatment with regard to the cost of public transport. Their sense of relative deprivation seemed to spring from comparisons made between themselves and other elderly people in different communities. They did not seem to view themselves as justifiably liable to pay higher fares than elderly people elsewhere because they belonged to a community in which local conditions caused relatively high costs of public transport provision.

Given a public transport system which was viewed by many to be inadequate and expensive, those who owned cars often considered the availability of private transport to be very important and necessary. This was the case particularly among respondents living in more outlying districts of Whitstable. The attitude was exemplified by comments made by respondents living in Chestfield, Swalecliffe, Seasalter and Yorkletts. Among car owners, the appreciation of the importance of car transport was tinged in

most cases by some anxiety about the difficulty of maintaining and running a car, due to the high cost of doing so, and the likely consequences of having to give up driving.

> "It all depends on running a car. Things would be very different if we didn't have a car."
>
> "I am fortunate having a car, a lot of people do have difficulty because it costs them 35 pence to get down to near a shopping centre."
>
> "If we didn't have a car, which takes a big slice out of our income, it would cost £1.00 for us both." (To go to the chiropody clinic for treatment.)
>
> "You see we have a car at the moment, but its just that we won't be able to run it much longer through money.....We've had the car for years and when we have to pay anything on it, it has to be out of the small bit of savings we have got. We keep saying that next time we can't afford it."

Those who did not own cars were asked whether there was somebody who could give them a lift if necessary. Many answered negatively (see chapter 9) and in some cases lifts were only to be had from other people at certain times or in emergencies.

> "Yes, a neighbour. But they're mostly out at work during the day."
>
> "Well, at times we could get a lift if it was really urgent. But normally we have to have two buses to get in."

Several respondents said in reply to this question that they were reluctant to ask for lifts for fear of being a nuisance to others, or because they wished to retain their independence.

> "Yes, but I'm independent. I don't ask."
>
> "Yes, but I don't bother them."
>
> "They may do but I'm a bad one for asking."
>
> "No, I don't like to ask favours."
>
> "No. We never ask them. We always walk everywhere."
>
> "Well, I have friends, but I don't like to ask them."
>
> "Well, I use the bus usually. I don't usually ask anybody to give me a lift. Its so inconvenient isn't it."

"Well I expect that they would but I don't think that I would ask anyone really."

"Well I have a son in the area. I have to beg lifts from time to time. But I'm afraid that I'm very independent. I manage on my own whenever I can."

Many felt that the only way to obtain a lift by car if they needed one would be by taking a taxi. Some of these respondents seemed to be contemplating extraordinary circumstances in which transport by car would be necessary. However for certain interviewees, especially some of those interviewed at home who were relatively immobile a taxi was necessary in fairly commonplace situations.

"No. We have to pay for a taxi."
"No. I'd have to get a taxi."

"We can go out as long as I've got transport. That's why we've got to take a taxi."

Several respondents, asked how they would get to the casualty department of a hospital in an emergency, replied that they would take a taxi if necessary.

"I'd take a taxi if necessary, if I couldn't get a bus."

Some elderly people were able to pay reduced fares if they needed to take a taxi. A respondent from Seasalter explained to me that the local residents' association had made a special arrangement with a taxi company so that if 'sympathetic' drivers were available they would provide a service at half fare for elderly residents. Another respondent who was registered blind was able to make use of a scheme organized by the 'Blind Society', which pays for taxis to bring groups of people into Whitstable to obtain chiropody treatment. The existence of such schemes was further evidence of a problem of access to facilities in Whitstable from the outlying parts of the town which was recognized in a 'normative' way by voluntary organizations as well as by elderly people who were effected by their own lack of access to the town centre. The Age Concern Organization also

operated a voluntary minibus service which transported some elderly people living on the outskirts of the town to and from the Rest Centre, enabling them to do shopping and use other facilities in the town. A second bus was being brought into operation in Whitstable and one was also planned for Broadstairs. To those using this type of service, it was clearly very valuable in allieviating the problems of reaching local facilities, and some reported that they were able to use the minibus to attend doctor's surgeries at the health centre. For example, two respondents living in Dargate commented;

> "I don't know what we would do without that little bus."
>
> "That is our biggest difficulty - getting anywhere. The minibus is a great help. There's a very good sense out here of helping."

Another respondent explained that she found it much easier to travel to Whitstable and back by the minibus because it called near her home, while there was a twenty minute walk to the nearest bus stop.

Many people with cars obviously carried out a very valuable service in voluntarily providing car transport for elderly people. Organisations such as Age Concern and the Women's Royal Voluntary Society, as well as wardens responsible for social assistance to elderly people in council estates were engaged in organizing volunteer car drivers to help meet the need of older members of the population. One respondent even reported taking lifts from the driver of a vehicle for the disabled. There is also no doubt that community centres for the elderly perform a useful function in providing a focal point for cummunication and organization of voluntary schemes and a convenient and comfortable centre for people to assemble at arrival and departure of voluntary transport services, particularly in winter, when waiting out of doors for transport is especially difficult for the elderly.

However, the discussion in chapter 2 demonstrated that the problems

attending the provision of voluntary transport are legion. In view of these difficulties it is perhaps not surprising that there were those who said that they would have liked to use the service if it had been available to them, or if it were organized differently. One such interviewee was unable to use the minibus on the days on which it called at her home because she was tied to the house looking after her husband whose mental condition was deteriorating seriously. She obtained a lift from neighbours but paid for petrol. Another, with rheumatoid arthritis and a heart condition, said that although she did not use the minibus she would have liked to be able to do so. Another found that although she had the opportunity to use the bus she "can't always make the time" when the bus leaves at 9.00 in the morning, a difficulty which seems more serious when it is realized that for some elderly people getting up may be a long and difficult procedure. (Some respondents interviewed at home who were in poor health were not fully dressed when the interviewer called at 10.00 or 11.00 in the morning). Some of those interviewed were not aware that the minibus service was operating in Whitstable, although most of these would probably not normally have been eligible to use the service. Several of those reporting that access to health services was difficult did not use the minibus and others who did make use of the voluntary bus service would not use it to reach health facilities, which were located at some distance from the minibus pick-up point at the day centre. The analysis in Chapter 9, which attempts to discover how those with access difficulties may be distinguished from respondents who do not perceive difficulties, may be of some interest to those concerned in developing voluntary transport services in Broadstairs and Whitstable. The data indicated the factors related to inadequate access to doctors' surgeries. These factors seemed likely to be associated with need for voluntary transport services.

SHRINKING ACTION SPACES AND LIMITED RESIDENTIAL MOBILITY

The general impression gained from the interviews was that many elderly people found their mobility limited by various factors, including physical disabilities, lack of private transport, inadequate or costly public transport, and failure to obtain transport through voluntary transport schemes or simple good neighbourliness. This situation was perceived by the respondents to be an important cause of one of the most striking aspects of the information gained from the survey; the restricted and shrinking character of the action spaces of some of the elderly individuals interviewed.

Before considering this problem in detail, it should be explained that not all of those interviewed had this characteristic. Certain respondents from both Whitstable and Broadstairs reported regular trips out of their home town to other places in East Kent. For example, one respondent went every month to Westgate from Broadstairs to take advantage of the better shopping facilities, another reported making occasional visits to Canterbury by car, and one said she might go to Canterbury by bus for a day's shopping; a return journey costing 90 pence from her home in Whitstable. The following comment from an elderly man in Broadstairs was typical of those who were able to enjoy a visit to a neighbouring town.

> "Actually, as I am in lodgings I don't have to get much shopping. But for clothes....if I want anything I like to go to Canterbury. I have a brother there, you see. I like to go there for a day out and while I am there I like to have a shop round."

However, for others, the cost of such journeys was a cause for complaint. One respondent was indignant at the cost of her fortnightly journey from Whitstable to visit her daughter in Canterbury, which was £1.28. She had to limit herself to Whitstable for shopping, although she found the shops there less attractive, because she "can't afford a pound to Canterbury."

Both Broadstairs and Whitstable have fairly limited shopping opportunities and a number of respondents, when asked where they went for weekly shopping, mentioned that they would have preferred to be able to use facilities elsewhere which offered a better choice and cheaper prices. For example, a return fare of 50 pence was sufficient to deter one respondent, who commented;

> "I would go to Ramsgate if I could afford it, but its too expensive. The fares really stop you moving about."

Similarly, another informant from Broadstairs said that she would have liked to go shopping in Ramsgate but could not afford the journey unless she went alone without her husband, since "it would costs more than £1.00 for two."

A third felt compelled to shop locally because he could not afford the fares to Margate or Ramsgate and considered a trip to Canterbury to be "out of the question."

Comments in the same vein came from Whitstable residents;

> "You don't go down to Whitstable or Canterbury unless you've got to. It's £1.00 to Canterbury and it's 50 pence to get to Whitstable and back."

> "None of us can afford to go to Canterbury these days."

For some respondents the action space within which they perceived themselves able to move for normal purposes without excessive difficulty was even more limited and the friction of distance very high. For example, one respondent living near the centre of Broadstairs was asked where she went for the weekly shopping and replied,

> "In Broadstairs....I don't go farther than that now. I can't go away now."

This was a walk of little more than a quarter of a mile, but when asked how long it took to get there she responded;

> "I can't walk very far....about half an hour, twenty minutes."

The walk to the health clinic, rather more than half a mile from this

respondent's home was perceived to be "a long way."

For another respondent, the local post office, less than a quarter of a mile away was the limit to the distance she could walk, beyond which she "can't go any further", and her weekly shopping was brought in by someone else.

The following comments from respondents in Whitstable also reflect the perceived limitations of their capacity to move about.

> "Well, walking it would take me an hour I should think. As I am, because I'm on sticks, you see. But it's really only about 10 minutes, I would think, for anybody walking normally, maybe 15 minutes."

> "I can't walk far. If I go up to the library (a quarter of a mile away) I take the bus up and walk back."

For those elderly people who were housebound the geographical extent of their activities was, of course, completely confined. One respondent told me she had not been out of the house for two years. In Broadstairs, three housebound respondents living next door to each other in council accommodation were able to communicate with one another only by phone, or, in one case, by tapping on the connecting wall. The wisdom of housing three such people together in relative isolation seemed highly questionable.

This growing restriction on the distance over which elderly people find themselves able to travel for ordinary purposes, imposed by the difficulty and cost of local journeys seems to support the ideas proposed by Rowles. (See Chapter 3 of this thesis). In particular the constriction process appears to be operating on the geographical worlds of several of those interviewed, in that their action spaces have become more confined. However, many are not resigned to this tendency and constriction has led to dissatisfaction, resulting from failure to adapt to, and accept, the changes in their geographical experience. The evidence from the survey also suggested that environmental changes due to declining mobility of the type suggested by Schooler (1976) might occur even without residential movement, and that some respondents lacked the competence to adapt to these changes.

In this survey there was evidence for various different manifestations of failure to adjust to the environmental constriction resulting from reduced mobility. One reaction was expressed as feelings of dissatisfaction and frustration at the limitations imposed by a constricted action space. In particular , complaints were made about the inaccessibility of facilities in neighbouring towns, examples of which have been quoted above.

Another manifestation of failure to adjust emerged as expressions of dissatisfaction with residential location and frustrated desires to move which in extreme cases were almost claustrophobic in character.

> "I wouldn't advise anybody to do what we've done; to come down here."

> "The difficulty is, I live in the country. I liked living in Bromley. It was my mistake and I paid for it."

> "I only go shopping once a week; it costs too much money. This is the last place God on Earth made - so far away from the shops..... unless you run a car. I'd like to get nearer the shops."

> "We've never liked it since we came here. The council doesn't understand how we feel about it.....The only thing we're grumbling about - we're stuck here and people come and smash things up. You can't get anything done from the council....They won't do anything about moving us nearer to the son.....The council has no thought about elderly people."

These comments suggest a situation very far removed from Tiebout's notion, discussed in Chapter 1, of a population 'voting with its feet' and each being able to choose a residential location which suits his own requirements. In a situation in which force of social and economic circumstances keeps elderly people in a residential location which they do not prefer, inadequacy in accessibility to public service facilities is more likely to be viewed as socially unjust than it would be in the case of a completely mobile population, able to select its residential location freely.

Another condition reported by two of those interviewed was agrophobia. In one case the interviewee explained that she normally took a taxi to attend surgery at the Whitstable Health Centre because she felt unable to

go alone, and the fare of the taxi was not much more than the cost of paying bus fares for herself and a companion. The second respondent clearly found it quite traumatic to go more than a few dozen paces from the front door, especially to a place with which she was unfamiliar. She had not, however, explained about this feeling to the doctor and had not been able to register with another doctor whose surgery was closer at hand. She felt that her doctor should have been more willing to visit her at home on occasions when she had been ill.

Some respondents seemed to be experiencing some anxiety or doubts about their ability to cope with circumstances in the future as they saw their level of physical mobility beginning to decline.

> "I manage so far. I don't know what I'll do in times to come."

> "All the while I can walk I don't mind. It does me good. But it is a little bit outlandish here."

> "I get worried. We get odd aches and pains and I think when we get a bit older it is quite a long way to all the things. We do think that everything is a long way away; and at the moment.....if he is well he can drive the car, but I don't drive so that I would have to do all the walking. And we can get our medicine by sending a stamped addressed envelope both ways, but I would still have to come a long way to the chemist."

Even among those whose own condition gave them little cause for concern there was some appreciation of the difficulties faced by others with a lesser degree of mobility.

> "It's easy enough for us; we've only got to pop in the car. If you were pretty poorly you'd want to get there and back (to the doctor's surgery) which you can't; you've got to be gone three hours. For other people its much more difficult."

> "We don't have any problems. We manage. We're mobile, aren't we. But for them that isn't it must be a bit difficult."

Many of the responses quoted above were somewhat disturbing in that they reflect a failure among many of the interviewees to plan sensibly for retirement, bearing in mind the likely changes which will affect their geographical experience with advancing years. Many of those who had come

to retire in Broadstairs and Whitstable seemed to have regarded the places they had known well as holiday resorts as an ideal location to 'get away from it all' in retirement.

> "The reason why I came down here was, when I was two I was very delicate. I spent every holiday till 1922 down at Whitstable."

> "We've only lived here since September twelve month, otherwise we lived in London. But we've had the bungalow here for 30 years, so you can put down that I've known Margate, Ramsgate for 60 years or more."

Another respondent living on the edge of a council estate in Whistatble explained how much she was attracted by the open view of green fields from her window, which contrasted so well with the urban vista to which she was accustomed in London. An elderly lady interviewed in Broadstairs was already regretting her impulsive action in selling up her home in the Medway towns and leaving her friends and family to come to Broadstairs after the death of her husband. At the time she had clearly been seized with a desire to make a new start, away from painful memories, but her depression had increased on finding herself lonely in a town where she had no old friends.

The places familiar as summer holiday retreats are not always the most comfortable or convenient places for permanent residence, particularly in the winter weather, and especially since many elderly people can only afford homes in the more outlying areas, or are living in council accommodation located away from the town centre. Under these circumstances there is risk that these elderly people will become, to use Rowles' phrase, ' 'prisoners of space'.

The existence of this type of problem was endorsed by a social worker in Whitstable who suggested that older people would be well advised to plan for two phases of retirement, spending the early years between 55 and 75 in the countryside if it attracted them and then moving to a more accessible location with better services in their later years. However, in the face of current rises in the price of accommodation, and with a fixed and limited income, it may be difficult for the elderly to be able to carry out such

plans, even if they have made them. Furthermore, the problems reported here resulted not only from changes in the mobility of individuals, but also from factors such as withdrawal of bus services, rising fares and increasing centralization of facilities. These are rather recent phenomena which have altered the circumstances of some retired people considerably, but which could hardly have been foreseen on the scale they have ocurred by individuals on the point of retirement ten or fifteen years ago. Such changes are particularly difficult to anticipate when making plans for retirement.

Similar problems associated with 'retiring to the seaside' have been reported by Karn, who also found that;

> "From the way that elderly people talked about their ideal way of spending retirement - getting away from towns, resting and relaxing, living by the seaside - there was clearly an identification of 'retirement' with 'holiday'. That this particular generation should identify 'holiday' with 'seaside' holiday is only to be expected."
>
> (Karn, 1977b, p.6)

Karn concluded that the majority of those moving to the seaside did not regret the move. However, she also noted that widowed people and single people in Clacton frequently did regret the move. Such people were a relatively high proportion of those interviewed in this study, so it is perhaps not surprising that several of them indicated some dissatisfaction with their present residential location.

Nevertheless, certain people who were interviewed seemed to have been relatively far sighted in their choice of residential location for retirement, and to have benefitted from acting upon sensible decisions. They lived in fairly central locations and explained that they were very conveniently placed for facilities and had had this point in mind when choosing their home. For example, one respondent had moved to the centre of Whitstable from Blean because after her husband died she had no transport and thought it was better to be in the town closer to the shops. Similarly, a respondent from

Broadstairs commented,

> "We're very handy to everything....I think that was one of the reasons we moved there really, thinking that we weren't going to get any younger."

In view of the failure of some elderly people to plan for and adjust to retirement, and considering the problems facing local authorities in providing health and social services for the large elderly populations in seaside retirement towns it was to be expected that a number of elderly people would perceive access to health services to be problematic. This aspect of respondents' views is considered in the next section.

PERCEPTIONS OF SPATIAL ACCESS TO HEALTH CARE

The following chapter deals with the frequency of reports of difficulty with access to different primary care facilities, and also analyses the information gathered from the informants as a group about their mode of travel to such service centres. The discussion here will therefore concentrate on the views expressed by individuals which illustrate the problems involved. Questions asked about the location of health facilities used by the respondents and the journeys made to reach them also prompted a number of comments, and interviewees were asked to explain their replies when they referred to difficulties encountered in getting to health services. The most comprehensive data obtained related to access to the General Practitioner's surgery and these are reviewed first.

It was found that for some individuals barriers existed due to factors which would be insignificant to younger or more mobile people. In particular, a number of interviewees reported difficulty in walking, especially when they felt unwell, a problem which was exacerbated by the poor bus service between their home and the surgery. The following comments were made by different respondents from Broadstairs and Whitstable, all of whom said they experienced some difficulty in getting to the surgery.

"I can't walk uphill."

"You have to get on a bus. You can't walk, there are too many hills."

"It depends how I felt. If you didn't feel too well you'd have to get a bus or make some other arrangement. It's alright going, but it's uphill going back."

"It's difficult because of the walking. There's no public transport."

'I've got to have my stick....I have to walk from here to the bus stop in the High Street. And I have to cross the road. It's all according to how I feel."

"I manage to get there....It's not very easy; it's a three quarter hour walk."

"It's difficult unless you have a taxi. That's expensive."

"It's a long way when you're not very well, there are so few buses."

"It's OK in fine weather - more difficult in the wet - you have to walk to the bus stop."

"It's uphill. It is a bit difficult. I find the stairs terribly difficult."

"It's difficult if the weather's bad. It's a long walk."

"It's difficult because of the bus fare."

"When I get on and off the bus it hurts. It's killing for me to stand. I had to cancel an appointment because I was too queer to go."

"It's difficult because it's so far away."

"We get to Whitstable and then we've got to walk. Out here we've only got that one bus. With the bus that goes from here it only goes as far as the High Street."

Some respondents who said they found getting to the surgery easy gave accounts of the journey which sounded so laborious that they made the interviewer surprised that spatial access to the surgery was not considered difficult. For example, the comment from this respondent living on the outskirts of Whitstable:

"I take my time. There's a seat at the library and I have a rest. If I rode from Joy Lane it would cost 9 pence single. That's quite a lot, isn't it."

In several cases the problem was seen to be one of making the journey

to the surgery in order to meet an appointment, particularly for patients attending the Whitstable health centre, as indicated by the comments below from Whitstable residents.

> You've got to be careful with the buses because you've got to get back. I have my appointment at 3.00, then I've got to wait till 5.00 to come back... Unless you're fit it's hopeless. You're relying on other people all the time."

> "It's difficult if there are no buses. They have taken off the buses. If my appointment's for 12.00 I have to wait for a bus home - about three hours."

> "If I get the bus at 9.00, I get there at 10.00. Then I'm last on the list and I don't get out till 12.00. I can't get home after 12.00, so I have a taxi."

> "It's really panic stations. Our first bus is at 7.30. The next is at 10.20. By then most of the surgeries are finished."

For respondents in Broadstairs and Whitstable, especially those without a telephone, the necessity of making an appointment sometimes resulted in an additional trip to the surgery before seeing the doctor.

> "You've got to go twice. You've got to go first to book."

> "It's two journeys really, you have to go down to make the appointment."

Some of those interviewed who found it easy to get to the surgery seemed to view the difficulty as a problem of obtaining an appointment and negotiating the barriers which they perceived to be placed between them and the doctor by the receptionists. It was interesting that the interviewer had the impression that the most vociferous complaints of this type, like the third respondent quoted below, were men.

> "It's easy if you can get appointments. They're so busy."

> "You have to make an appointment even before you're ill, really."

> "I do find that when you want to see your doctor you come up against women. You go up to the centre and say you want to see the doctor and they ask 'Why do you want to see him?'....for ordinary people I don't think it's necessary. Everybody finds that those ladies come in between you and the doctor. We think the doctor should be there... but the women try to save them time, they're so busy. The first thing they say, 'The doctor's very busy.' That's the first thing; 'The Doctor's very busy. What is it?' Always coming between you and the doctor."

As explained in Chapter 3, the relationship between spatial accessibility and use of health services is likely to be complex and one would not necessarily expect to be able to show that poor access causes a reduction in utilization. However, some respondents did suggest that they might visit the doctor more frequently if spatial access to the surgery was less difficult.

> "The bus doesn't go all the way to the surgery. I put off going."
>
> "There's times when you feel you'd like to go and see the doctor. But it's so far to go, you don't."
>
> "That's why I don't see a doctor a lot. I can't walk up there. It's usually the summer before I get round to seeing a doctor."
>
> "If you had a cold you'd think twice about going down there" (to the Whitstable health centre.)

The comments quoted above, as well as others in a similar vein which are not reproduced here, suggest that, for some elderly people, spatial access to the doctor's surgery was perceived to present a problem and was one of the barriers which might affect access to health care in general. As explained in Chapter 7, many respondents were not very ready to hypothesise about whether or not they would prefer an alternative location for the surgery. However, in Whitstable, where the surgeries of the local doctors had recently been moved from dispersed group practices throughout the town to a single health centre, a number of people voiced opinions about the desirability of this move and some had views about how the location of surgeries might have been better arranged. People from Swalecliffe seemed to feel particularly strongly on this point since they had previously had a local branch surgery but were now over a mile away from the health centre. One respondent explained that the old surgery had been more convenient and that a local petition had been raised without success against its closure when the new health centre was opened. The respondent thought that since there was a council housing estate at Swalecliffe the town council should be responsible for establishing a GP's surgery there, although, in fact,

the local authority would not have control over such matters, which are ultimately at the discretion of the doctors concerned. Other residents from the Swalecliffe area also felt that the new arrangement was less convenient. Their feelings were exemplified by the following quotes:

> "He, (the doctor) used to have a room in a house at the top. That was much easier really."

> "It's a long way (to the health centre). It was easier with the other surgery at Swalecliffe."

> "The health centre is beautiful, but inconvenient if you live out of the area. They have to call doctors out more now in winter. It was nearer before. It was very convenient. They should have something at the community centre." (at Swalecliffe).

> "In some ways it was (better with the local branch surgery.) The health centre is a very elaborate building. It would have been better divided into 3 smaller units, here, Whitstable and Seasalter."

Respondents from the other side of Whitstable were also critical of the health centre location.

> "The Cromwell Road surgery was closer. There should be a surgery or a chemist at Seasalter, or at least one doctor one day a week."

> "I think it's very far out for the Seasalter people; for the Whitstable and Seasalter people it's a problem. It's too far out really."

This respondent also felt that the surgery she used previously was;

> "Nearer in a way. It was a bit far out of town but it was certainly nearer than this. I think this is too far out, honestly, and for a lot of people up at Tankerton it's a problem."

A respondent from Yorkletts, a village several miles from Whitstable commented;

> "For myself it (the health centre) would be better if it was up the other end. For people in Swalecliffe it would be better where it is. For Yorkletts people it would be better up the other end of town, but that would upset the Swalecliffe people. I suppose it's as near central as it can be. I think when they had this land here (at the old people's Rest Centre) it was very silly not to put all this lot together."

There were also other interviewees who thought that the old system of dispersed surgeries was preferable in spite of the improved facilities at the health centre.

> "That palatial place - nobody likes it....Of course they (the old

surgeries) were strategically situated by bus stops, but at the health centre you have to give them 24 hours notice. That means two visits there. If you hand in a prescription on Friday you might not get it until Monday or Tuesday...I'd much rather go to the old squalid what-not because it is near a bus stop and near where I do my shopping. The other is rather out of the way. For convenience it's not all that could be desired."

"It works well for them (the doctors). But I feel sorry for a lot of old people; they have to take a bus from the Co-op...It has been a drawback since they moved to the health centre....We're used to having a doctor where you must go down the town. It used to be in Oxford St. You could make an appointment and go straight there and see him."

Thus for some people the improvements in the quality of service made possible by the health centre were considered to be more beneficial for the doctors than for the patients, and it was thought that for elderly people the benefits of the health centre were outweighed by the fact that it made health care less accessible, partly since the positions of the surgeries had been centralized, and partly because the new facilities were somewhat overwhelming. One respondent actually commented that the health centre was too big for elderly people to understand and too centralized especially for those in Swalecliffe and Seasalter. In her opinion;

"All this grouping is all wrong."

It seemed possible that the rather frequent reports of dissatisfaction experienced by those living in Whitstable (see Table 9 and discussion in Chapter 9) might result from this feeling that the old system of dispersed surgeries was preferable to the new system. Having had some real experience of both arrangements, respondents felt they were in a position to make comparisons. In this case a sense of relative deprivation existed among the elderly respondents, which arose from comparisons made with their own previous condition as a frame of reference, rather than from perceptions of the circumstances of a comparative reference group of other people. Adjustment to a new system might be especially difficult for certain elderly people who, as has been explained, were experiencing a constriction of their action space to a relatively small realm of active geographical

experience, and who might also, in Rowles' terms, have been becoming more set in their ways 'through a process of selective intensification'.

However, by contrast, some other respondents seemed to have adjusted quite happily to the new health centre. One thought the centre "a very good idea", in spite of the fact that it was;

> "...a bit out of the way....There's no transport, we've got to walk. I'm used to walking."

Another was asked whether the Cromwell Road surgery was closer to her home than the health centre, and gave her views as a non-user of the health facility;

> "Yes, it would be nearer. Although there's not much in it because Cromwell Road you go one way and the health centre is the other way ...I think one would have to make an appointment. I never go, you see. I have been once with a friend, just nosey like, to see what it was like, and I was quite impressed with it, but I've not been as a patient, so I can't say."

While the health centre presents greater access difficulties for some Whitstable residents, for others it is actually more accessible than their previous surgery.

> "I've always heard it well spoken of. People grumble because it's a long way. But it was worse before, wasn't it. It was right down the bottom of Cromwell Road. You couldn't get there by bus, where as you can get to this."

The improved facilities available at the health centre were considered by some respondents to be desirable, provided that the doctor was also able to call to their home if they could not reach the surgery. One respondent, who received regular visits from her doctor, commented,

> "I really feel its quite a good system because it's in a pretty central place for everyone and, of course, it is a health centre; it has most of the facilities one does want. Where as you go in a little surgery and if you want something done you've either got to go up to the hospital or else....so really the centre is the most sensible place for the surgery."

This attitude is also reflected in the following comments from two different respondents;

"I think the centre's marvellous with everybody's doctor there.... If I couldn't get to the doctor then I should have to ring and get him to call. I wouldn't attempt to go down there if I was so ill I couldn't get there. It would be foolish when you can call the doctor in...I always try to time my appointment so I can get down there."

"I think it's a marvellous idea. Mind you, I can't speak for people who live two or three miles away. Most people have cars. I think it's probably the best thing. The only thing I would like - I suppose it's asking too much, is for the doctor to be able to come and see you without any comment, discrimination or anything else. Like it used to be in the old days. If you're fit enough then you don't mind going, but in cases like my wife - he does come if she's badly ill, but other times she thinks she'll have him, but then she says she must try and get down the clinic."

In Broadstairs, where the health centre had not yet been built, and people were using surgeries dispersed throughout the town, some interesting replies were given when respondents were asked whether their doctor's surgery was the nearest to their home. The following examples showed that, in reality, many people did not have complete freedom of choice over the practice or the location of the surgery when they registered with a doctor.

"No. It's the only one I could get."

"No. But they're full up; they won't take me."

"I was going to have Dr.....here in .....He said 'Well, I can only take you temporary till we've got another doctor coming into our parish'. But he's very nice."

"No. It's the only one that I could get on to. I tried seven to see if I could get on to them but Dr.....was the only one, and I find that he's very good.....I tried Dr....., Dr....., and Dr.... down town, and I think it was at the foot clinic, they said try Dr..... And I had to go down and see him....and from that he said 'Yes, I can take the two of you'. Naturally, at first, there's a doctor practically on the doorstep - just across the road, but that doctor was full. But as regards the doctor I've got, I have full confidence in the man, which makes a big difference."

These comments suggested that registration patterns might not reflect patient's first preference for surgery location, although it did appear that once established with a general practitioner, elderly people often developed a strong alliegance to, and respect for, their doctor, which was

thought to outweigh the relative inconvenience of the surgery. The experiences of the last respondent quoted above, who had recently taken up residence in Broadstairs after retirement from his job in London, might have been avoided if he had applied for assistance directly to the Family Practitioner Committee. However, his story suggested that doctors may be hard pressed to accommodate incoming elderly people on their practice lists, which was interesting in view of the fact that the Broadstairs MPA was classed as being of intermediate status and there were, therefore, no incentives for new doctors to enter the area. Although this study produced no evidence to test the idea, one may speculate as to whether doctors were reluctant to expand the size of their practice beyond the intermediate level because of the high workload associated with a large number of elderly patients. In such a situation, additional elderly patients registering with the practice would be particularly unwelcome. Karn drew attention to this problem in her study of the problems of Retiring to the Seaside. Her estimate of the extra workload associated with elderly patients has been quoted previously (see Chapter 2) and she explained that;

> "As a consequence, most doctors in the resorts show a marked preference for taking on younger rather than older patients. A doctor from Southport describes the position:
>
> "No doctor likes to refuse acceptance to elderly people who have newly come to the town, but experience has shown only too clearly that the numbers of items of service required annually by the over sixty fives is greatly in excess of the national average, ...and knowing that they have insufficient time to deal adequately with the problems they present, (doctors) are reluctant to take on more time consuming responsibilities."
>
> (Karn, 1977a, p.204)

Whether or not this type of problem exists in reality in Broadstairs, the situation was perceived in similar terms by at least one elderly person living in the town who commented;

> "Doctors should make an effort to see elderly patients more than they

> do, especially the over seventies....Family doctors don't take any interest in the elderly; they're so busy with youngsters who are working."

Another respondent seemed to feel that the situation with regard to home visiting was particularly difficult in Broadstairs. She was registered with a doctor from the neighbouring MPA of Ramsgate. However, although the surgery was not the closest to her home, she explained that;

> "It doesn't inconvenience me any, for the simple reason that if there was any problem they'd come out. In fact I'm better off than people living in Broadstairs. They have much more difficulty with their doctors."

If the doctors in Broadstairs were under particular pressure due to the large number of elderly people in their area, this might account for the views expressed in letters received from doctors in Broadstairs in reply to the author's own letter, circulated to inform the local GPs about the survey she was conducting. The tone appeared rather beleaguered as the doctors wrote;

> "I always regard these sort of surveys with some reserve. They tend to raise patient expectation, which may be a good thing in itself, but can hardly be matched with the restricted resources that are available.
>
> I am sure you will have had many anecdotal points made by general practitioners of patients demanding visits. For what it is worth one of my yard-sticks is that if the patient is able to get out to the hair-dresser, they are well enough to attend the surgery. In the final analysis I suppose mobility and accessibility can be reduced to financial terms."
>
> "By definition, it is fact that elderly people love to complain - usually without justification. There is no doubt that most would dearly love the doctor to always visit them and save them the bother of going to the surgery. The fact of the matter is that the vast majority of all ages are perfectly capable of coming to the Surgery by one means or another. Another fact is that an unreasonable number of requests for visits to homes is consistently made in the UK, which certainly does not obtain on other countries. Any GP will tell you that if patients genuinely cannot get to the Surgery he will visit; very often he finds the visit (a) not really required and (b) the patient could have got to the Surgery. Obviously these points do not always apply - but it is surprising how often they do. Age is no bar. I have a 96 year old private patient who, though in mild heart failure, frequently walks from the bottom of the town up the steep hill to my Surgery but only asks me to visit him if his condition is

genuinely bad. There are few who are so reasonable.

> Visits are said to take approximately four times the length of a Surgery consultation. There are only so many hours in one day and if the doctor has to visit, then his time cannot be spent attending to others - who often need him more."

The reluctance of doctors to make some home visits should not however, be over-stressed, since they obviously did frequently visit elderly patients at home. Several respondents stated that their doctor would call on them if it were necessary, although many also said that they would only call the doctor out if there was a real need to do so and others indicated that they were obliged to attend the surgery if this was at all possible. The following quotes exemplify cases in which respondents appeared to be satisfied with the willingness to make home calls shown by the doctor.

> "If I'm not well the doctor has come."

> "It's no problem whatever to see my doctor....He is a man who will come to you."

> "He doesn't let me go to the surgery. He comes at once if I call him."

> "The doctor is very good. He said 'Any time you want me, call me'."

At times when the respondent was unable to attend a surgery, telephone communication might have improved access to the doctor, although many respondents apparently only used the phone in cases of serious illness or an emergency.

> "Now that I've got a phone, if I felt bad I'd phone him. But I wouldn't be able to if it was something trivial."

> "You can't speak to the doctor over the phone unless its urgent."

Thus although a relatively high proportion of the interviewees owned a telephone (see chapter 9) this might not normally have affected the accessibility of the doctor for many of them. Quite a large proportion did not own a telephone and some said that they were unable to afford one. For others it was not possible to use a phone because they were hard of hearing. Some respondents reported that their doctor had arranged for them to have a telephone installed free of charge because of their need

to be able to phone the doctor in an emergency. Others said that they would have liked to take advantage of such an arrangement.

The material from the survey presented a rather confusing picture of the degree to which telephone contact enables elderly people to avoid the difficulties of travelling to the surgery. The general impression was that the accepted procedure for use of the telephone to obtain health care varies from doctor to doctor and from patient to patient. The situation was particularly unclear with regard to the practice of obtaining repeat prescriptions for chronic conditions. Repeat prescriptions are a very common requirement for elderly people and these were often obtained from the doctor without an additional consultation taking place. Thus the patient did not need to go to the surgery except to collect the prescription. Some respondents reported making two journeys to the surgery, first to ask for the prescription and the second time to collect it. Alternatively, some people explained that they phoned for the prescription and then collected it, while others sent a stamped addressed envelope and the prescription was returned to them by post. Another procedure involved the issue of a card for a particular prescription to the patient, who delivered the card and then returned to collect the prescription later.

Some people appeared to feel that the effort or cost required to obtain a prescription was excessive.

> "It's a bad thing, this prescription business. You have to make two journeys. Or you can send a stamped addressed envelope, but that's all money."

> "We have to send for his prescription every month. I have to send for mine as well from the doctor. We send it by post and put a stamped addressed envelope in it. Then we send it to the chemist and someone picks it up. That's three 9p stamps we have to pay."

> "If you want a prescription you call in and call back next day. It's alright if you have transport....One month he will allow me to write for a prescription."

Some interviewees commented that they were unable to telephone for prescriptions and one respondent gave the following account of the difficulty

she experienced obtaining a prescription for her husband, who had had a lung removed.

> "The main thing is, just lately, my hubby, he had a very bad chest. Well, we didn't ask the doctor to call, but he had some medicine that did a good job. I phoned up for medicine. I'd got to walk right up to get here, so I thought they'd put a prescription out. The lady - I got a bit told off because I was wasting time for the doctor. So I said 'I'm sorry but I thought he was queer enough to have the doctor', we were saving his time, you see. She said she would do it that time. So I can never telephone anymore. I can't drive a car. I came in for the prescription - for our doctor we have to go right up to the health centre at the harbour. So that must be three miles... That was trouble actually because it was awful weather and we was doing it to save the doctor coming out."

The difficulty which this respondent had experienced obviously loomed large in her mind and it was interesting that she overestimated the distance from her home to the surgery. Possibly some of these difficulties described by the respondents quoted above might have been overcome if there had been a better understanding on the part of the patients about the possible ways to organize the collection of prescriptions, and on the part of health service personnel and doctors of the problems which patients were experiencing.

When the prescription has been obtained from the doctor there was sometimes a further difficulty in reaching a dispensing chemist to have the medicine prepared. As local chemists are frequently forced to close, due to the diseconomies of operating at a small scale, dispensing services are being increasingly concentrated in larger, more centralized chemists shops. This may pose a problem for those in more remote residential areas and respondents made the following comments about making the journey to the chemist for prescribed medicine.

> "It's easy as long as I'm feeling alright and the car's going. If I had to walk then I'd find it difficult. It's out of my range for walking."

> "If you called the doctor you would have to get someone to go down to get it the prescription made. It would be difficult in an emergency."

"It's quite easy on the bus but it costs 26 pence to go."

"It's the hardest thing I do. Because it's walking, you see."

"With the weather like it has been, that makes it ever so hard."

A respondent from Seasalter explained that the current residential building development there was to have included a chemist's shop, but that so far the site had been developed only for housing, while another interviewee was annoyed at the recent closure of her nearest chemist.

These comments suggested that some elderly people were likely to perceive difficulty in obtaining prescriptions. It seemed highly questionable whether elderly people who are entitled to free prescribed medicine should have been subjected to access costs which they considered to be unacceptable. These costs were viewed in terms of physical difficulty of reaching the doctor's surgery or the chemist, the cost of fares or of postage, or the delay in obtaining medicine.

The discussion so far about spatial access to health care has been concentrated on general medical services provided by the family doctor. However, information was also obtained about access to chiropody, outpatient clinics and casualty units.

The most commonly mentioned problem affecting access to chiropody was the difficulty of obtaining an appointment. Waiting lists for treatment were so long that clients frequently said that they had to wait for three to six months for an appointment. Some respondents found that this was inadequate and said that they were obtaining treatment privately. Some had private treatment because they considered the NHS chiropody clinics to be intended for those who were too disabled to care for their own feet, or who were unable to afford chiropody;

> "I've never tried anywhere else. We have always been very satisfied with the gentleman calling (private chiropodist calls at home). It does relieve them for someone who does need them, someone who can't get it, doesn't it."

For some respondents the reason for not obtaining chiropody regularly seemed to be associated with the difficulty of travelling to the clinic.

> "It's difficult to arrange if they can't fit them in when the bus goes. It's a good £1.80 just for us both to into town and back."

> "Once the weather's alright I can go. Of course I get a bit out of breath."

Since many respondents had not had cause to use hospital facilities for outpatient or casualty treatment, some of their views were not based on their actual experience. In many cases interviewees who anticipated the greatest difficulty in reaching the hospital seemed to be those who had not in fact had to do so. Those who had received hospital treatment as outpatients had often travelled by ambulance and consequently perceived the journey to be relatively easy. Several respondents confused outpatient and casualty services, which was hardly surprising, since they often operate from the same part of the hospital. In particular, when asked about their use of outpatients' clinics, several gave an account of a visit to hospital for casualty treatment for an accident or injury, without referral by a GP. some others gave an account of receiving inpatient treatment. Others added comments about hospital visiting. For this reason, in the second phase of the main interview survey, an attempt was made to distinguish between outpatient and emergency facilities at local hospitals and respondents were asked the reason why they had attended outpatient and casualty facilities. In view of this apparent confusion, it was thought more appropriate to consider replies to these questions in terms of individual's perceptions of access to hospital facilities as a whole.

In order to obtain outpatient or casualty treatment many respondents reported that it was necessary to travel out of town. Although some of those living in Whitstable mentioned services available from the health centre and the Tankerton Cottage Hospital. It was apparent that not all the respondents had received treatment at hospitals. Also, for

elderly people, travel between different towns was relatively unusual. Thus it was perhaps not surprising that several individuals were rather vague about, for example, where they would go for casualty treatment in an emergency. Some suggested that they would telephone their doctor first. A surprisingly large number seemed to think that they would call an ambulance to the hospital only as a last resort, and some did not mention transport by ambulance at all, but based their assessment of the ease of the journey on the availability of bus travel.

Many respondents in Whitstable viewed the Kent and Canterbury hospital in Canterbury as the nearest facility for casualty treatment and the following comments are examples of their views about the journey there.

> "It's a long way to Canterbury unless you've got transport. You have to get the bus down to Joy Lane. Then a bus to Canterbury. Then catch a bus to the hospital. It's a long journey and very expensive. In an emergency you'd just have to call an ambulance. You couldn't struggle away on three buses.....Another great difficulty is if you've someone in hospital; visiting, that's a very great trial....You've got to rely on volunteers."

> "A bit awkward that. You have to take two buses. Now and again we can get one bus all the way, but that is very infrequent. Normally our way of getting to Canterbury is to take a bus to the Tolgate, that's at the bottom of Joy Lane, and a double decker bus to Canterbury ....and then another bus - three buses in fact. And that could be quite awkward."

> "If I were in a fainting condition I would phone and ask them what I should do. They'd probably say, 'Haven't you a friend who could bring you?'"

> "I'd take a taxi if necessary, if I couldn't get a bus."

Several of those who reported that they attended outpatients travelled by ambulance. For the most part this made access easy but one respondent made the point that there were long waits for ambulance transport.

> "It's easy enough to get there by ambulance but you may be two or three hours waiting to get back home again."

The nearest hospital facilities mentioned by interviewees in Broadstairs were at Ramsgate, Margate and Canterbury. The following comments relating to access to outpatient clinics were made by respondents who did not attend an outpatient clinic, but thought that access to the hospital

would be difficult.

> "It's quite a job for people our age. Too far for people to walk; especially if they're not well. You can get a bus - but then again you don't know these buses. They've cut three buses out."

> "It's awkward; you've either got to go right round to Ramsgate, or walk a mile and a quarter, or pay for a taxi."

Another respondent who did attend an outpatient's clinic at Margate for treatment said she found it easy to get there when transport was provided.

> "I go by ambulance. It would be difficult without."

In order to reach the casualty unit at Ramsgate, she thought,

> "I should have to have transport."

CONCLUSIONS

The evidence considered in this chapter supported the idea that the geographical experience of some elderly individuals tended to be constricted in terms of the distance regularly travelled in the action space and the numbers of journeys made. Some of this constriction was thought by respondents to be due to their limited mobility, which for some individuals resulted from the constraints of their physical condition, and for others was due to the high cost or inadequacy of public transport systems. Public transport for the elderly in both towns, especially in outlying areas of Whitstable was seen by many to be inadequate and only supplemented to a limited extent by voluntary transport provision. The geographical constriction of their activities was the cause of dissatisfaction and frustration among several of these elderly people. The views expressed by respondents included some which indicated that for a proportion of those interviewed the poor accessibility of various local facilities, including those for health care, was appreciated as producing difficult circumstances.

In certain cases respondents reported that the difficulty of access affected their use of health services. Some of the difficulties were possibly amenable to improvement by organizational means if these could have been implemented, for example, by allocation of patients to nearer practices, a greater use of the telephone, especially for obtaining prescriptions, more home visits, or simply coordinating appointments to correspond more conveniently with bus times. The position of the surgery premises was considered to affect accessibility by some respondents, particularly those in Whitstable, who were not in favour of the centralization of surgeries in the health centre, and would have preferred a more decentralized pattern of surgeries.

The discussion in this Chapter has concentrated on the opinions and statements of individuals and has not considered the frequency of incidence of dissatisfaction or tried to identify relationships between satisfaction and perceptions of accessibility and other characteristics of the population, except on an impressionistic level. A more complete analysis is attempted in the following chapter which studies the features of the population as a group.

An important point arising from the consideration of the material reported in this Chapter is that perceptions of dissatisfaction or difficulty were expressions of relative deprivation. Satisfaction was therefore largely a function of expectation (Pope, 1978). The expectations of the elderly people interviewed may have been influenced quite strongly by the extent to which their experience had enabled them to compare their situation with that of reference groups (through contact with other elderly people in better circumstances), or of reference situations (through experience of different circumstances which compared favourably with their present condition). The question of whether the expectations of these elderly people was justified appeals to the arguments of social justice which were introduced in chapters 1 and 2, and is given further consideration in following chapters.

CHAPTER 9

ANALYSIS OF THE SURVEY RESPONSES IN AGGREGATE

In chapter 8 the views of individual respondents relating to their perceptions and experience of travel to health facilities were discussed without a systematic analysis of the survey population as a group. This chapter reports on the analysis of the respondents in aggregate, using quantitative techniques to search for patterns of behaviour and perceptions which varied in a consistent way with other characteristics of the respondents.

The analysis is considered in two sections. The first is concerned with an attempt to test for relationships between respondents' perceptions of difficulty of access to their doctor's surgery and their other characteristics; the second reports a study of the patterns evident in respondents' views about the locations of, and access to, various local facilities and their accounts of their travel behaviour in using these facilities.

THE ASSOCIATIONS BETWEEN HEALTH, MOBILITY AND SPATIAL ACCESS TO HEALTH CARE

In Part I of this thesis, it was argued that elderly people have a high need for health care and that it would be inequitable if individuals in this group were to experience barriers of access to health care, unless they were in fact more healthy than the average elderly person. The analysis reported here was partly intended to test whether those perceiving spatial access to health care to be difficult differed from other respondents in the condition of their health.

In Chapters 1 and 2 it was also argued that in order to take action to reduce inequities arising from variation in spatial access it would be necessary to improve our understanding of the factors causing perceived access problems. The discussion in Chapter 4 indicated that the perceived ease or difficulty of access was likely to be associated with demographic, social and mobility characteristics of the respondents concerned. These

arguments suggested that if those who perceived access to be difficult also exhibited characteristics which might be expected to reduce spatial accessibility, then an impartial observer would be inclined to accept that these individuals were reporting circumstances which represented a poorer level of spatial access to health care than that available to those without access difficulty. In short, subjective access difficulty would be recognizable as a reflection of objective access deficiency. Furthermore, if it were possible to predict perception of access difficulty from data on demography and health of the survey respondents, this would suggest that it might be possible to develop weighting systems for elderly populations, using information available from existing census and survey sources, which would indicate those for whom spatial access most needs to be improved. Such a weighting system, if it could be developed for elderly people in East Kent, for example, might be applied in a location-allocation procedure, such as the one considered in Chapters 5 and 6, to plan surgery locations. Alternatively, the weighting might be employed as an indicator of need for improved access to health care, to identify those requiring public service intervention to compensate them for poor spatial access. The analysis of association between variables was therefore carried out for two reasons. First, to discover whether the experience of those perceiving travel to health care facilities to be difficult should be considered to be inequitable, and, second, to investigate the possibility of explaining and predicting variation in respondents' perception of access difficulty by their demographic and mobility characteristics.

The most complete information on respondents' perceptions of access to health care was obtained with respect to the journey to the doctor's surgery. This service was selected for particular attention because of the significance of the doctor's surgery as the most common point of first contact with the primary care services (Chapter 2), and because, of all

the facilities considered, it is that which is likely to be required by the largest number of respondents with the greatest variety of illnesses. There were very few respondents who had never had to attend their doctor's surgery at some time and the majority had consulted their GP in the previous 12 months. Utilization rates were therefore higher than for the other services considered and the question of access to the doctor's surgery was likely to be of direct concern to more of the respondents than were problems of travel to other NHS facilities.

The analysis tested for association between variables relating to spatial access to the doctor's surgery. The principal statistical technique used to test for associations was analysis of variance, which shows the extent to which the variation in the dependent variable is associated with variation in the independent variables. This procedure is available as part of the SPSS package (Nie et al., 1975,Ch.2). The analysis of variance programme offers the possibility of introducing factors into the analysis hierarchically, so that the significance of the relationship with the dependent variable is tested for each factor after variation due to preceding variables has been accounted for. In addition, a multiple classification analysis was obtained. These tables show how the mean of the dependent variable for sub-groups of respondents vary from the overall mean when the sub groups represent different values for the independent variables given by the DEVN. The multiple classification analysis, therefore, reveals how the mean of the dependent variable is affected by different values of the independent variables. The squared value of the ETA statistic represents the proportion of the total variation from the mean in the dependent variable which is accounted for by variation between groups classified according to the independent factor. The BETA statistic is similar to a partial correlation coefficient and represents the ratio of the variation explained by an independent factor to the total residual variation which is not explained by other factors in the analysis. These two statistics, therefore, show the importance of each of the

independent factors in contributing additional 'explanation' of the variation in the dependent variable. The amount of the total variation explained by all the independent variables together is indicated by the R^2 (R - squared) statistic. Where there is strong interaction between factors, the multiple classification analysis is not valid. Therefore the analysis of variance procedure was also used to identify significant interrelationships between the independent variables in their effects on the independent variable. Where such associations occured the variables were combined to create a single variable representing variation in both factors.

In order to discover how the survey data corresponded to the model established in Chapter 6, the analysis of variance was carried out in stages corresponding to the sets of relationships postulated in the model. The results of the analysis will be presented here in the same order to illustrate the evidence for the main sets of relationships hypothesised in the model. The structure of these relationships is of a hierarchical nature, and it was expected that for any one set of variables the associations will be strongest with those factors with which the causal links are most direct. According to this model, four main sets of relationships would be tested, as illustrated in Figure 9a. These may be summarized as follows;

1) The association between social, demographic and health factors and mobility;

2) The links between mobility, geographical distribution of facilities and transport mode used for the journey to health facilities;

3) The effect of travel method and distance to be travelled on the costs, in terms of fares, effort and time taken to reach facilities;

4) The influence of these costs on the perception of ease of access by the clients concerned.

The results of the analyses corresponding to these four sets of associations are presented in Appendix1,Tables 9:1 - 9:22 , and the findings are discussed in the following paragraphs. Unless otherwise

stated, associations are considered to be statistically significant if the F ratios exceeded the 95% confidence limit, and significant relationships are given particular attention in this account. The terms used in the analyses are defined in the appended tabulations of results.

The first of the associations to be tested involves independent social, demographic and health variables, which were expected to influence dependent variables of levels of mobility. The analysis tested the effect of age, sex, marital status and household composition on the probability that respondents would be able to drive themselves, or would have a lift in a car available if required. The influence of these social and demographic variables on physical capacity to walk was also of interest.

Whether or not the respondent drove a car was found to be most significantly related to sex and household composition. These factors interact together to explain 15% of the variation in the dependent variable. Men living alone or with their wife were more likely to drive, while women, and men in other types of household, included fewer car drivers (Table 9:1).

Those who did not drive were asked about the availability of car transport. The most significant variable in explaining the availability of lifts was household composition. Respondents living alone or with their spouse are less likely to have car transport available than those living with a younger family, or with elderly people other than their spouse, in private households or institutions. Once again, the level of explanation is fairly low; only 16% of the variation in the dependent variable can be explained in terms of the variation in the socio-demographic factors. (Table 9:2).

Data on physical capacity to walk was provided by respondents' accounts of the effects of any illnesses or disabilities from which they suffered. Those who reported that they could not walk fast or far, or

who had difficulty climbing steps, were considered to have limited walking ability. Illnesses which were found to be most likely to be associated with restricted capacity to walk were arthritis, rheumatism, circulatory conditions and the effects of strokes and paralysis. The analysis showed that 45% of the variation in walking ability could be explained by whether or not the respondent suffered from any of these diseases. (Table 9:3) Introducing demographic variables into the analysis did not appear to contribute much additional explanation of the variation in walking ability among the respondents. Sex and age variables only increased the overall R-squared value by 3% (Table 9:4).

The second set of associations to be tested were those between the mode of transport used to travel to the doctor's surgery and independent variables of distance and mobility factors. Journeys to the surgery were considered to be long if they exceeded 1 mile. This criterion was selected because the likelihood of access difficulty was significantly associated with travel over 1 mile at the 90% level of confidence, and because, as reported in Chapter 4, this represents a distance beyond which many elderly people consider themselves unable to walk, and are more likely to find it necessary to use transport. Car travel seemed to be rather weakly associated with the availability of a car when this factor was considered in isolation (Table 9:5). However, the interaction between sex and car availability was more strongly linked with the transport mode used for travel to the surgery. Men who had a car available were more likely to travel to the surgery by car. The interaction between household composition and marital status was also significantly associated with the probability of use of this mode of transport. Single people and those living alone or in lodgings or institutions were less likely to travel by car, while married and widowed respondents who did not live alone were more likely to use this mode. (Table 9:6) Travel by bus was

mainly related to distance to the surgery which was expected since longer distances most often necessitate bus travel. Social and demographic factors, were not significantly related. (Table 9:7).

Those travelling a shorter distance were more likely to walk, and this relationship accounted for 21% of the variation in whether or not respondents travel to the surgery on foot. Women were more likely to walk than men. (Tables 9:8 & 9:9).

The third group of associations analysed were the relationships between transport mode, distance and walking ability and the cost of the journey to the surgery in terms of fare costs and travel time. Table 9:10 shows that 37% of fare cost variation for those travelling by bus was related to whether or not respondents travelled more than 1 mile. Those with a lift available were significantly more likely to estimate fares to be lower than those who do not drive. Those aged 70 to 79 maybe likely to have lower fare costs, although the association is less significant. (Table 9:11). When these variables were included in the analysis 50% of the variation in reported fares was explained. The reported costs of fares to the doctor's surgery are slightly lower for those with a concessionary fare card, when the distance to the surgery is taken into account, (Table 9:12), but the difference was not significant at the 90% significance level.

Travel time to the surgery was found to be mainly related to distance to be travelled and travel mode, especially whether or not the journey was made by car (Table 9:13 and 9:14) The level of explanation provided by these factors was low (15%). However, it was not possible to derive a greater level of explanation from other variables such as car availability or socio-demographic factors, as was expected from the pattern of relationships hypothesised in the model. (Table 9:15).

Finally, perception of access difficulty was introduced as the

dependent variable in the analysis. The proportion of the variation which could be explained in terms of car availability or socio-demographic variables was very low (Tables 9:16 & 9:17) However, access difficulty did appear to be significantly more common among those respondents who had health conditions associated with inability to walk (Table 9:18). Those without debilitating illnesses of any kind were less likely to perceive access to be difficult, although this association is not significant (Table 9:19). It was therefore concluded that those who perceive access to the doctor's surgery to be difficult had morbidity levels, indicated by the incidence of debilitating illnesses, which were at least as high as for respondents without access difficulty. With respect to some conditions, those with access problems were in fact in worse health than other interviewees. It was therefore concluded that the perceived access experienced by some respondents with respect to travel to the surgery were detrimental to social justice.

Indicators of the frequency of use of the doctor's surgery were not significantly associated with perception of spatial accessibility of the facility (Tables 9:19 and 9:20)This finding was anticipated in the discussion in Chapter 3, which showed that because of the large number of influential factors bearing on consultation rates, no single variable is likely to have very great explanatory power. The multiple classification tables suggest that those who had made most frequent and most recent use of their doctor's surgery were slightly more likely to have access difficulty. This was to be expected, since the illnesses found to be associated with access problems were mainly of a chronic nature and likely to require regular surgery visits for repeat prescriptions or medical checks.

The costs of the journey to the doctor's surgery also appeared to be significantly related to access difficulty. Longer journeys and journey times, and higher fares are the factors which of all the independent

variables tested showed the strongest association with the incidence of perceived access problems. These variables were, however, intercorrelated with each other, so that it was necessary to combine them in a single variable representing travel time, distance and the cost of fares. Table 9:21 shows that respondents for whom travel to the surgery involved low fares and short journeys tended to have a lower than average probability of access difficulty. Those respondents most often quoting access problems are those with journeys over 1 mile, travel time exceeding 15 minutes, and who also pay a fare to travel to the surgery. The interaction between these factors explains 26% of the variation in access difficulty between respondents. Table 9:22 shows that respondents with limited walking ability were more likely to experience access difficulty (significant at the 90% confidence level). However, the level of explanation provided by this variable was comparatively low.

In summary, the results of the analysis show significant associations between the dependent variables of mobility, travel mode, travel costs and perceived access difficulty, and the factors postulated in the model as likely determinants. Furthermore, the strongest associations appear to be between those factors which were hypothesised to be most directly linked with each other. Respondents who perceive access to their doctor's surgery to be difficult were found to be more likely to experience relatively high costs in terms of time effort and financial expenditure. The health characteristics of those with access difficulty suggest that these respondents were most likely to be in need of their doctor's care. Their circumstances were, therefore, inequitable in comparison with respondents without any problem of spatial access. The results obtained indicate that perceived access difficulty represents relative deprivation which is objectively recognizable and socially inequitable.

The explanatory power of the independent factors in the model, represented by the R^2 statistic, was rather low in most of the results. However,

it seemed that this was to be expected given the nature of the variables which had been analysed, and did not invalidate the hypothesised model of associations. This is particularly true with respect to the indicator of perceived difficulty of access, since other researchers using indicators of satisfaction have also found the correlations with objective indicators low although the associations were expected intuitively. Such results are exemplified by the work of Campbell et al (1976) on life satisfaction of American citizens, which was conducted amongst a much larger sample population than the one considered here and used more complex measures of satisfaction. These authors suggested that the low levels of correlation obtained were to be expected for several reasons; first, the relationship between objective environmental factors and perceived well-being was hypothesised as being an indirect one, with personal aspirations and values influencing the association. In particular, individual expectations governed by comparisons with other people are important, as is also the process of accommodation, whereby individuals' response to change in their environment is often initially strong, but wanes with time so that even those in very difficult circumstances may not react strongly against their condition after having grown accustomed to it over a long period. The evidence in Chapter 8 showed that the respondents' view of their mobility and access to the doctor's surgery was probably affected by their perception of their circumstances compared with those of other elderly people. Furthermore, those who had recently experienced centralization of surgery facilities into a health centre held some of the most vehemently expressed views on access to health care. It therefore seems quite plausible that these extraneous factors would account for some variation in perceptions.

Campbell et al. (1976,p.70,71) also suggested that because of the complexity of life satisfaction, variation in one domain may influence

other aspects of well-being. One point made by these authors, which was of particular interest in the context of this study was that, while respondents' view of their health was not generally related to satisfaction with other domains of life satisfaction, for some respondents with especially poor health, their ill-health coloured their view of many other aspects of life. The authors speculate, without testing the proposition, that for elderly people, health may be a significant domain contributing to variation in satisfaction with other life experiences. Evidence to support this hypothesis has been provided by Spreitzer et al. (1979) who used data from three recent national surveys to test the influence of health and income on life satisfaction. Income was more important for those aged under 65, but for older people, while income was still important, health factors were overriding. Their findings correspond with the results reported here, which show that reports of certain health conditions are significantly associated with perceived inaccessibility of the doctor's surgery. This point is discussed in the conclusion to this chapter.

A third point made by Campbell et al (1976, p.40-50, p.474-496) was that in view of the complexity of life satisfaction, valid and accurate measurement is much more difficult to achieve than for 'objective' aspects of the environment. Low correlations therefore, may be indicative of paucity of measurement techniques rather than inadequacy of theory. The problem of measuring perceptions was reviewed with respect to this study in Chapters 3 and 7, and probably applies to the method of assessment employed to gauge perceived difficulty of access to health care.

These three issues are also likely to have relevance to the data collected from respondents on the perceived cost of access in travel time and (perhaps to a lesser extent) in the cost of fares. These arguments may, therefore, help to explain the fairly low R-squared values obtained for the association between these factors and hypothesised independent

variables of demography and mobility.

It should also be borne in mind that when Analysis of Variance is applied to binary dependent variables, the R squared levels are expected to be relatively low. More complex Analysis of Variance techniques, for handling binary data do exist (eg. Searle, 1971, p294) but they are not included in the SPSS package, and were not available to the author for this research. Therefore, as a further test of the central issue of the equity of the pattern of perceived access for respondents, the author also used Discriminant Analysis to test the relationship between perceived spatial access and health and mobility. This procedure operates by classifying individual observations into groups predicted to have different values of the dependent variable. This classification is carried out on the basis of the values of independent variables. The output from this analysis indicates the percentage of cases which can be correctly categorized in this way.

The procedure was used to categorize the respondents into two groups; one with and one without perceived access difficulty, using data on journey costs and health. The results from this analysis are shown in Table 9:23. They indicate that, on the basis of information on journey costs, 68% of all the respondents analysed could be correctly categorized into the two groups. 80% of those with perceived access difficulty were correctly classified in this analysis. (Table 9.23a). A further analysis was conducted of respondents in the second phase of the survey. The results indicated that 55% of those with access difficulty, were correctly classified, solely on the basis of whether or not they had illnesses associated with walking difficulty (Table 9.23b). Also, over 80% of all respondents from the second phase were correctly classed using information on journey costs and ability to walk.

These results, which were statistically significant, provide further evidence that respondents perceiving access to the surgery to be difficult were more likely than others to have high travel costs and to have those

illnesses found to be associated with low mobility.

Thus, while the model proposed in Chapter 4 was upheld to some extent by the evidence, it seems that certain modifications are appropriate. These are discussed in the conclusion to this chapter.

THE ACTION SPACE AND BEHAVIOUR WITHIN IT; ANALYSIS OF TRAVEL PATTERNS TO LOCAL FACILITIES.

The discussion in this section is concerned with the results of an analysis of respondents' spatial behaviour, particularly as revealed by their reported use of service facility locations. The importance of the action space in interpreting spatial behaviour was considered in Chapter 3, and this part of the analysis attempted to build up a picture of the extent of the action spaces of the respondents and to discover what interrelationships existed between the action space,perception of the opportunities offered by the environment, and spatial behaviour.

In studying the available information on the action spaces of the respondents to this survey, the following questions are considered:

1) Where there was a choice of facility location (post office shops, chemist) did respondents choose the nearest facility? If so, this indicates a distance decay tendency in their behaviour, suggesting that facilities which were closer were preferable because the friction of distance was a significant factor affecting the attractiveness of the facility.

2) If the closest facility was not used, was this because the facility was used as part of a multiple purpose trip? The costs of travelling to a more distant facility might be mitigated if the journey had to be made for another purpose and both activities could be achieved in one journey. If this were the case, the longer journey might have been perceived by the consumer to 'cost' less in real terms

than a special journey made solely in order to use a facility which was closer. In this situation, consumers might still be thought of as exhibiting a tendency to minimize the costs of spatial access as far as possible.

If the facility used was not the closest and was not used in the course of a multiple purpose trip, then it seemed less likely that the respondent was seeking to minimize travel costs, and presumably other costs or benefits were more important in determining his or her behaviour. For example, if the quality of service was perceived to differ between facilities, the extra cost of travel to a more distant location might be outweighed by the extra benefits gained from the better quality of service available compared with that available closer to hand. Alternatively, the costs of travel might be insignificant to the individual in choosing a facility location.

3) Respondents might have had less freedom of choice of health facility locations, partly because there are fewer service centres, and partly because their access to some facility locations was restricted. For example, in the case of surgeries, patients might have found that only a restricted number of doctors were able to accommodate them on the practice list, or that the Family Practitioner Committee allocated them to a GP. The reasons for choosing the GP were therefore of interst, especially in Broadstairs where there were a number of different surgeries. Some evidence is presented of the extent to which the location used represented the respondent's own choice among the possible alternatives and whether spatial proximity was one of the factors influencing their choice.

4) How did the journey to health facilities compare with travel to other service locations? Hunt (1978, p122) found that among the national sample of elderly people the journey time to the GP was

on average longer than to other local facilities. The analysis reported here sought to discover whether this was true for the elderly respondents in this survey, and whether or not travel to health facilities necessitated abnormal journeys not usually encompassed by the action space. This question was relevant to perception of access since it was thought that if abnormal travel was necessary, the health facility was more likely to be viewed as causing additional costs and difficulty of access.

5) A further point of interest was whether perceived access difficulty to health care was cumulative for individuals, that is, whether those experiencing difficulty with one type of service facility also found other facilities inaccessible. It was thought that those perceiving access to be difficult for more than one facility would represent a particularly disadvantaged group from the point of view of spatial access.

The following analysis was designed to try to discover the answers to these questions, so that the study of the action space might reveal something of the way in which respondents perceived the costs and benefits of access to primary health care services. The results are presented in Appendix 1 (Tables 9:24 - 9:35). Information was gathered from all respondents on the location of various local facilities; shops, post office, chemist, chiropodist, GP's surgery, and outpatient and casualty clinics in hospitals. For most of these, interviewees were also asked whether they used the nearest facility to their home or another. In the first stage of interviewing, data was collected on the mode of travel to these facilities, and in the second stage respondents were asked, for each health facility, whether or not they experienced difficulty of access. All the respondents were asked for details about travel and problems of access to their doctor's surgery and whether a special journey was necessary to travel to any of the facilities covered by the questionnaire, apart from general shopping centres. The places mentioned in the following

analysis are illustrated on maps of the two towns studied in Figures 8a and 8b.

The choice of local facility locations

The analysis of the respondents'accounts of their use of post offices, shops and dispensing chemists illustrated their preferences among a number of locations available in the town which they might have used. The facilities used may be thought of as indicators of the locations which were likely to figure in the action space when the individual was free to choose among alternatives.

Most of the respondents used a post office, principally in order to collect pensions, and over 80% used the post office which they said was the closest to their home (Table 9:24). The positions given by respondents for their nearest post office included a number of different locations which broadly reflected the residential distribution of the respondents, since most parts of both towns have a local post office or sub-post office. The majority of those respondents who said they did not use their nearest post office used another located closer to the town centre. It was expected that for these respondents a visit to the post office would be combined with shopping in town. The post office, therefore, appears to represent a service for which respondents tend to minimize perceived distance to be travelled in their choice of facility location.

Relatively few of those interviewed travelled outside the town for shopping purposes(Table 9:25) In Broadstairs there are three main locations used for shopping. The town centre is used most frequently, but smaller numbers of the respondents reported using shops in the Broadway and in the St. Peters-Reading St. area. The majority of Whitstable respondents shopped in the town centre,but some of those living on the eastern side of the town used more local facilities, and some of these travelled to Herne Bay as an alternative shopping centre. The evidence

therefore supported the impression gained from the material considered in Chapter 8 that the elderly people included in the survey used local facilities for the most part, rather than larger shopping centres in neighbouring towns. This illustrated the rather constricted character of the action spaces of these individuals.

Most respondents used their nearest chemist (Table 9:26a) so that travel minimizing behaviour also applies to this facility. Among those who did not do so in Whitstable, a large proportion reported that they used the dispensary in Tower Parade, which is conveniently close to the health centre from which prescriptions are collected. The High Street in Broadstairs was most commonly used by those not using their nearest dispensary in this town. The majority of respondents used a chemist in the same vicinity as their shops or post office, so that the journey to the chemist would for these people be similar to that made regularly for other purposes. (Table 9:26b)

As might be expected, it appeared that those having their nearest chemist in the same part of town as their post office or shops were more likely to combine the trip to the chemist with a journey to another facility, rather than make a special trip, (Table 9:26c) Those making a special trip to the chemist were also more likely to find the journey difficult (Table 9:26d) The respondents, therefore, tended to minimize travel costs in selecting their chemist and were more likely to find their chemist inaccessible if it was outside their routine action space encompassed by travel to other frequently used facilities.

Use of Health Facility Locations

It seemed likely that some respondents would have a more restricted choice of location of health facilities and therefore might have less opportunity to minimize travel costs. Information was collected for example, which shows that 30% of those interviewed in Broadstairs reported that their doctor's surgery was not the nearest one to their home. This

supports the suggestion in Chapter 8 that a high proportion of people are not registered at their nearest surgery when there are several different surgery locations available within the Medical Practice Area. This has important implications for the location-allocation procedure described in Chapters 5 and 6 which is based on a hypothetical situation in which all consumers use the nearest facility. On the other hand, there is some evidence to suggest that a decay effect was operating over longer distances. All the respondents in Whitstable used doctors with surgeries in the town rather than in other urban centres. Most of those in Broadstairs also used a doctor from within their MPA, although some respondents living on the out-skirts of Broadstairs used surgeries in neighbouring towns which were as close as those in the town centre of Broadstairs.

The respondents were also asked why they chose their doctor. It was anticipated that those who had a free choice among the alternative doctors would be more likely to select a doctor with the nearest surgery location, while those to whom a doctor was allocated by the family practitioner committee would have less opportunity to select a convenient surgery location. In fact, this expectation was not supported by the evidence. The respondents from Broadstairs were classified into two groups comprising, first, those who were allocated to a doctor by their Family Practitioner Committee or whose present doctor took over the practice with which they were previously registered, and, second, those who gave reasons why they had selected their doctor themselves. The evidence suggests that those who chose their doctor themselves are no more likely to select the nearest surgery than those who do not exercise free choice in the matter (Table 9:27). It appears that those who selected their GP themselves include a majority who did so because they perceived the doctor to be a good practitioner, rather than because the surgery was convenient. There was, however, a minority in this group who did state that proximity

of the surgery was the reason for choosing their doctor. It appears, therefore, that while some people seek to minimize the costs of travel to the surgery, for many elderly respondents the quality of the service is more important than spatial access considerations. There is no evidence that those who selected their doctor with regard to spatial accessibility included a particularly large or small proportion of respondents who perceived the surgery to be inaccessible. This would seem to indicate that an individual could not be expected to avoid problems of spatial access solely by careful choice of a surgery with a view to his or her action space.

Since the respondents exhibited a relatively weak tendency to minimize travel costs to the surgery, in contrast to their behaviour in use of facility locations for post office, shops and chemist, one would have expected that journeys to the doctor would be longer than to these other facilities. The results from Hunt's survey also suggested that this would probably be the case, and the results of the present analysis bore out this expectation. Data collected on the time perceived by respondents to be required to travel to different facilities is summarized in Table 9:28. This information shows the average travel distance reported to the different facilities. Also shown are the percentage of the travel time estimates which were longer than 15 minutes, as an indication of the relative proportion of respondents making longer journeys. These data show a difference in travel times between the two towns in the survey; the average travel time and the percentage of reported travel times exceeding 15 minutes were greater for journeys to all facilities in Whitstable than in Broadstairs. In both towns, however, the average length of journeys to the doctor's surgery were longer than those to post office, chemist and shops, and a higher proportion of respondents reported trips taking longer than 15 minutes.

The analysis of variance showed that travel time exceeding 15 minutes was a significant factor contributing to perceived difficulty of access to the doctor's surgery. It would appear that relative lack of consideration of access costs in the selection of a GP has resulted for some elderly people in subsequent problems of perceived lack of spatial access.

The Journeys to health facilities in the context of the action space

The analysis of variance in the previous section also showed that travel time was related to transport mode, with travel times significantly lower for those travelling by car, whilst those walking or travelling by bus tend to report longer journeys, although the results were not very significant statistically. Further attention was paid to this relationship, and Table 9:29 shows travel mode used to the doctor's surgery cross tabulated against travel time. It may be seen that while walking times are on average shorter than time for bus journeys in Broadstairs, in Whitstable, walking trips take slightly longer on average than bus journeys. In both towns, journey times by car were considerably shorter on average, which corresponded with the analysis of variance result.

It was expected that if the journey to the doctor's surgery was longer than the journeys made to other local facilities it was more likely that respondents would make a special journey to the surgery, and that this might increase the probability of access difficulty. The majority of respondents (over 70%) made a special journey to attend the doctor's surgery, although about half of these did so because they had an appointment time at which to make the consultation. Therefore, the proportion making a special journey to use their doctor's surgery was higher than the percentage who made a special trip to use their dispensing chemist,(Table 9:30). This was apparently due to the organization

of service availability at the facility location as well as the fact that the journey to the surgery involved travel outside the routine action space. Table 9:31 also shows that those who made a special journey to the doctor's surgery were more likely to find access to be difficult, although the statistical level of confidence in this relationship was only 89%.

It appeared that the provision of voluntary transport schemes for the elderly had little effect on the journey to the doctor's surgery or to other primary health facilities. Of those interviewed in Whitstable 25% used the voluntary minibus service. These were all residents of Seasalter, Swalecliffe and Chestfield. Most of those using the bus did so for shopping trips; of the 50 respondents asked about their mode of travel to the shops, 10 reported using the voluntary bus service. Two respondents gave this as their means of transport to the chemist. No respondents reported that they used the minibus to attend the doctor's surgery. The voluntary transport service in Whitstable, therefore, appeared to be directed toward easing problems of routine journeys for the elderly rather than the more occasional and irregular travel necessary in order to use local health facilities. This may have been due to the problems mentioned in Chapter 2 of providing a voluntary transport service for irregular and infrequent journeys needing to be made by individuals rather than groups of people. Furthermore, if the voluntary transport service were to be organized to assist those with problems of access to their doctor's surgery, it would be necessary to change its clientelle as well as the service operated. Less than half of those currently using the voluntary minibus found access to the doctor to be difficult (Table 9:32). This is somewhat higher than expected, but not significantly so. Two thirds of those reporting access difficulty in Whitstable did not use the voluntary bus service.

Analysis of travel patterns also revealed certain aspects of spatial access to other primary health facilities, in addition to the doctor's surgery. Information was obtained on access to chiropody clinics, hospital outpatient clinics and casualty units.

The most striking aspect of the data on the location of chiropody clinics was the large proportion who did not know the location of a chiropody clinic (about a quarter of respondents from the centres). Most of these did not receive chiropody treatment. Some of those not using their nearest chiropody facility received treatment elsewhere, most commonly from a chiropodist calling at their home. Most of those from Whitstable who provided a location of a chiropody clinic chose to mention the health centre chiropody clinic. In Broadstairs the NHS clinic at the Broadway was also mentioned most frequently, although a smaller proportion of respondents gave the positions of private chiropodists or knew that chiropody treatment was available from the Old People's Day Centre in Broadstairs. The organization of chiropody services in the two towns therefore differed, since in Broadstairs there was a greater availability of private treatment, as an alternative to NHS services, than in Whitstable. Since the number of facilities was greater in Broadstairs, and these were distributed throughout the town it was expected that chiropody would be more readily accessible in Broadstairs than in Whitstable, where there was only one facility in the town located at the health centre. In fact, the proportion of those who knew the location of a chiropody clinic yet perceived it to be inaccessible was higher in Whitstable although the difference was not statistically significant (Table 9:33a). The average travel time to the chiropodist in Whitstable was longer and more of the Whitstable respondents make a special journey to the chiropodist, although the latter factor is not shown to be significantly related to access difficulty (Table 9:33b).

Informants seemed least well informed about facilities located outside the routine action space. For example, when respondents were asked to name the locations of the closest hospital outpatient and casualty facilities they tended to give vague or conflicting replies. In Broadstairs, more than half of the respondents viewed the Margate hospital as the closest for these services. Some cited the hospital at Ramsgate while others were uncertain which of the two were nearest or which had the facility in question. A few people mentioned Canterbury hospital as being the closest, particularly for casualty treatment in emergencies. Of the 76 respondents from the Broadstairs area, 13 did not know the location of the nearest casualty unit. Most people in Whitstable gave the Tankerton or Canterbury hospitals as the closest. Respondents most frequently stated that the nearest outpatient facility would be at Tankerton rather than Canterbury, while the hospital at Canterbury was most often quoted as the nearest facility for casualty treatment. A number of Whitstable respondents were unsure of the location of the facility in question and suggested more than one possible location, in Whitstable and Canterbury. The results indicated a good deal of undertainty and variable views about the location of the nearest facility. Those who had not used a casualty unit were significantly more likely to be ignorant of its location (Table 9:34a) and since the majority of respondents had not used this type of facility, it seems probable that this was the main cause of their lack of knowledge. (Table 9:34b). However, the statistical evidence did not support an association between use of outpatient facilities and knowledge of their location. This may have been because respondents had not understood what was meant by an 'outpatient clinic'.

The majority of respondents thought that some form of transport would be necessary to travel to hospital facilities, especially in

Broadstairs, where there is no hospital in the town. In Whitstable, however, some respondents reported that their closest outpatient clinic was in the town at the Tankerton hospital or the Health centre, and some of these would travel there on foot. As would be expected in view of the greater distances to be travelled, journey times to hospital facilities were longer than to other facilities (Table 9:28,) and a high proportion of respondents found them inaccessible, especially in Whitstable, (Table 9:34 c).Since respondents in Whitstable tended to anticipate a journey outside the town to Canterbury more frequently for casualty than for outpatient services, it was surprising that average travel times were estimated to be longer to outpatient clinics than to casualty. It was thought that the shorter average journey to casualty might be due to the fact that more respondents expected to travel by ambulance to reach a casualty unit than to an outpatient clinic.

The Cumulative problems of spatial access to health facilities

There is statistical evidence to support the view that those who found access to one type of health facility difficult also found other types of health care inaccessible. Among 39 respondents for whom complete information was available, 25 perceived at least one health facility to be inaccessible, and 18 reported difficulty with respect to more than one type of service. Those with perceived access difficulty for one or more facilities included a slightly higher than average proportion of respondents suffering from the specific types of illness found to be associated with poor access to the doctor's surgery, although the difference was not statistically significant.(Table 9:35). Thus it may be argued that among the type of elderly person interviewed in this survey, spatial access to health care was frequently seen to be a problem, and that the experience of these interviewees was inequitable, since they were no more healthy than other respondents and should therefore have

equal access to health care.

It appeared that problems of access to non-hospital facilities were particularly strongly associated. In Broadstairs and Whitstable respondents with perceived difficulty of access to their GP seemed likely to also be those having difficulty with respect to access to the chemist, (significant at 92% and 97% levels of confidence for the two towns respectively). There was also some indication that there was an association between poor access to the doctor's surgery and perceived difficulty in travelling to the Chiropodist (significant at the 90% confidence level).

Thus the survey results indicated that problems of spatial access to local health facilities are likely to be cumulative for a number of health facilities in the experience of individual elderly people.

Conclusions from the analysis of spatial behaviour and action spaces

The material reviewed in this section has traced some of the patterns evident in the aggregate behaviour and perceptions of the respondents and has revealed certain points about the ways in which they appeared to react to the friction of distance in their use of a range of local facilities. The evidence indicated that most of the respondents minimize the distance to be travelled in using shopping and post office facilities which had to be used relatively frequently and for which there was a choice to be made between a number of alternative facility locations. This distance minimizing behaviour also applied to the use of dispensing chemists, and respondents seemed more likely to find their chemist easily accessible if it was in a position close to other facilities which were used regularly and to which a special journey did not need to be made. Movement outside the routine action space in order to use a chemist was more likely to be viewed as representing some degree of difficulty.

It seemed that respondents had less freedom of choice of location for their doctor's surgery, but even those who were able to select their GP

from a number of different alternatives did not give very high priority to spatial accessibility, by comparison with considerations of the quality of service the doctor is likely to offer. Consequently, journeys tended to be longer and spatial access to the doctor was more often difficult than travel to the non-medical facilities considered. Journeys to other health facilities were also longer, and hospital clinics presented particular access difficulty for respondents. Problems of spatial access were often perceived by an individual with respect to more than one service.

GENERAL CONCLUSIONS AND IMPLICATIONS FOR THE MODEL OF SPATIAL ACCESS TO HEALTH CARE

Several findings relevant to the problem of perceived access to health care have been demonstrated by the analysis of aggregated data for survey respondents reported in this chapter, and in conclusion some consideration is given to the significance of these.

First, perceived access difficulty could be 'objectively' recognized as reflecting a relatively low level of spatial access to the respondent's GP., since perceptions showed a significant association with higher access costs in terms of distance, travel time and fares. Distance appeared to be as good a predictor of access difficulty as are other 'cost' measures, which suggested that the use of straight line distance as an indicator of spatial access costs in the allocation-location modee discussed in Chapter 5 may have been valid. However, the power of these predictors is greater when they are combined to measure the interaction effect.

Perceived access to the doctor's surgery was also significantly associated with certain types of ill health, which suggested that the difficulty experienced by respondents was inequitable. It is also possible that for some elderly people, ill health tended to depress their satisfaction with spatial access to their GP, so that for those who were in poor health a relatively low level of accessibility was particularly likely

to constitute a hardship. It was apparent that the health service was failing to make health care most accessible to those whose medical condition caused them to be, at the same time, most in need of care, and most likely to find spatial access a problem.

While respondents exhibited a tendency to minimize travel costs to facilities such as post office and chemist, many did not use their closest GP's surgery and only a minority selected their doctor on the basis of proximity of the surgery location. In general, the perceived quality of the doctor's care was more important in determining choice of a doctor. This finding emphasised the impression conveyed by the material analysed in Chapter 8, that adequate consideration is not always given to questions of accessibility of health facilities either by health care administrators and planners, or by the elderly themselves, in spite of the fact that problems of spatial access may arise. Furthermore, the interventions operating to improve the mobility of elderly people such as fare concessions and voluntary transport schemes, have relatively little effect on reducing the costs of access to the doctor's surgery for those respondents who found them unacceptable.

The findings in this chapter lent some support to the hypothetical model of associations postulated in Chapter 4, but suggested that the model should be modified somewhat, in the manner shown in Figure 9b.

In this diagram the principal associations of the original model have been retained, but the important effects of factors such as expectations, the degree of accommodation to changes in the system, the effect of travel outside the action space, and morbidity, have also been included. It was apparent from the analysis reported here that it would be difficult to produce a reliable weighting system to indicate the probability of perceived spatial access difficulty in an elderly population such as the one considered here, using only objective measures of social, demographic

and mobility factors. The possibilities for incorporating perceived costs of spatial access into the location-allocation procedures discussed in Chapter 5 would therefore be limited to populations for whom direct information on perceptions was available.

CHAPTER 10

THE IMPLICATIONS OF THE RESEARCH FOR PUBLIC FACILITY PLANNING WITH RESPECT TO THE ELDERLY

This thesis has demonstrated that spatial accessibility of primary care facilities presented a significant barrier to the availability of National Health services for certain types of elderly client, and that this was detrimental to a socially just pattern of availability of health services. The findings have also led to conclusions concerning suitable means of intervention to modify the existing pattern of accessibility for the individuals studied and the desirability of an integrated approach to public service planning. The empirical research enabled the author to examine alternative methods of assessing spatial accessibility of health services, which permitted analysis at the aggregate level and at the level of the individual client, and it was possible to draw some conclusions about the value of these methods for studying spatial accessibility of public facilities. These findings are summarized in this concluding chapter and the implications for public service planning are discussed.

SPATIAL ACCESSIBILITY AND THE NEED FOR SOCIAL INTERVENTION

The discussion of the objectives of the National Health Service and of public transport policy showed that the elderly are recognized to represent a group which is likely to have high need for health care and will also have a relatively low level of mobility. These disadvantages have been shown to be socially unjust and public policies and planning procedures have been designed to mitigate the effects of such deprivation by intervention through public health and transport services. However, this thesis has shown that within this recognized high need group there is a minority for whom the public service system fails at present to make health facilities sufficiently accessible to prevent perceived access

difficulty. This relative deprivation, which was identified from the perceptions of the individuals themselves, could be recognized in 'objective' as well as 'subjective' terms, since it seemed to spring from two aspects of the circumstances of the respondents; first, the fact that their homes were in positions which were relatively far from local facilities and their journey to the surgery was relatively long and expensive in fares, and, secondly, their health and mobility characteristics, which were related to health and social and demographic factors.

For housebound elderly people with the most serious ill health, whose physical mobility was most completely curtailed, low spatial accessibility of primary health facilities was likely to be compensated, since domicilliary care was made available to them, for example, by home visiting by GP's. However, there was a group with rather less severe difficulties (also including those suffering from agrophobic conditions) for whom the spatial accessibility of health care facilities was lower than for other elderly people, but for whom a greater level of domicilliary provision was not apparently available. Since the characteristics of this group were such that they were judged to be likely to need access to health care which was as good, if not better than, for other elderly people, their circumstances appeared to be inequitable.

The analysis also provided evidence that difficulty of access to health facilities tended to be cumulative; for example, those experiencing problems travelling to their doctor were also more likely to perceive access to the chemist to be difficult. There was some evidence to suggest that access to the chemist was more often perceived to be a problem in Broadstairs than in Whitstable. This may have resulted from the fact that a chemist was not always available at the location used for ordinary shopping and collection of pensions, so that special journeys had to be made. This emphasizes the desirability of locating local facilities in such a way that

they can be readily used in the course of normal daily movements. Thus a case might also be made for reducing relative deprivation of access to local non-medical and paramedical services such as shops and chemists. This would be based on the social objective of public transport policy discussed earlier in this thesis founded on the idea that a reasonable degree of mobility should be available to all.

POSSIBLE INTERVENTIONS TO REDUCE INEQUITY

There are three possible approaches to the problem. The first would be to plan the spatial distribution of health service facilities so that their locations are more readily accessible for those experiencing inadequate access at present. The second method would be an organizational solution, modifying the mode of delivery of services in order to overcome difficulties caused by spatial inaccessibility. The third possible option would be to make those in need of improved access more mobile so that they were able to use existing facility locations with less difficulty and 'cost' due to friction of distance. All of these approaches involve problems, which have been discussed in previous chapters and which will be briefly reviewed here.

The location allocation solution

The NHS exercises some control over the spatial distribution of health facilities by the allocation of capital funds through the General Practitioner Finance Corporation, and through the control of funds to Health Authorities using the RAWP system. The relocation of primary health facilities would also require cooperation on the part of practitioners and the planning and social service departments of local government authorities. However, other factors in addition to spatial accessibility enter into the choice of location of these facilities and it may be that these other considerations weigh more heavily upon the outcome of the location decision.

Furthermore, no distribution short of extreme decentralization would meet the claims for spatial access of residents from all areas of a community. The current trend towards development of health centres to replace the traditional individual doctor's surgery is a response to strong arguments in favour of a degree of centralization of primary health facilities. It therefore seems unlikely that relocation of health facilities would be a feasible, or a complete solution to the problems of spatial access experienced by some elderly people in the community. Nevertheless, some of the Whitstable residents felt strongly that some decentralization should be made through the provision of branch surgeries in those areas where access to the health centre is particularly difficult. Perhaps the question of accessibility should have been given more careful consideration in the planning of the Whitstable centre. The results of the survey argued in favour of a planning approach which, given alternative locations for a health centre, would incorporate considerations of spatial accessibility in the selection of a site.

Organizational solutions

This study also showed that the traditional system of dispersed surgeries was apparently not organized in such a way as to maximize spatial accessibility. Respondents in Broadstairs were not all registered with the GP whose surgery was the closest to their home, in spite of the fact that some would have preferred to use a doctor with a more accessible surgery. It does not seem likely, however, that a system whereby patients were registered with the doctor who had the nearest surgery would meet with acceptance from either the doctors or their patients. Patients have a right to register with a practitioner of their choice, and some respondents in the survey showed that they were prepared to tolerate a relatively poor level of spatial access in order to be treated by a GP whom they respected particularly and who was familiar to them. It also seems quite likely that

those who wished to transfer to the list of a doctor with a more accessible surgery might have difficulty in doing so because of the reluctance of GPs to take additional elderly patients onto their lists when they were already under considerable pressure from the heavy workload imposed by a practice including a large proportion of old people. It seems that the present system of remuneration of GPs, while making some allowance for a doctor's elderly patients, does not take sufficient account of the extra burdens borne by a practitioner caring for a population which has such numbers of elderly members.

Because of their high workloads, doctors with a large proportion of elderly patients were unlikely to be willing to increase the rate of home visiting to elderly clients under the existing system. The results of this research suggested that doctors should perhaps be encouraged to make more home visits to some elderly patients, for example, by the introduction of additional remuneration for home visiting for elderly clients living more than 1 mile from the surgery rather than 3 miles as at present. Alternatively, the additional capitation fee paid to doctors in respect of elderly people on their practice list might be increased in proportion to the number of their clients with the characteristics of low mobility shown in this study to be particularly associated with incidence of poor spatial access to the surgery.

Mobilizing the immobile; issues involved in improving transport services for the elderly

If the health facility mountain cannot come to Mohammed (even if he is elderly and immobile) then Mohammed must go to the mountain. As mentioned in Chapter 5 the alternative to spatial redistribution of a service system may be to reduce the friction of distance for the minority for whom it is inaccessible. Three possible ways of increasing the accessibility of health facilities by providing transport services have been

considered; the ambulance service, the public transport system and voluntary transport schemes.

Improving access to primary health care through the ambulance service

The discussion in Chapter 2 showed that the ambulance service is primarily equipped for transport of patients who are very immobile. The service is best suited for transport of patients who require treatment in hospital outpatient or casualty departments. However, it is less appropriate for travel to more local facilities and brief consultations, since it lacks flexibility and waiting times involved in using the service are often lengthy. The ambulance service is not intended to act as a form of public transport but is rather designed to treat special and acute need for transport to hospitals and clinics, particularly emergency needs.

Reducing the friction of distance for the elderly through public transport

Intervention through the public transport system could improve access to a range of local services in addition to health facilities. This might help to reduce for some elderly people the frustrations experienced as a result of the constriction of their action space by the friction of distance. The discussion in this study has been restricted to a consideration of provision of public transport through the local bus service. This approach to increasing the mobility of the elderly would have the advantage of being comparatively flexible, allowing individuals independence in their choice of travel times and routes.

It should be established at the outset that the study showed that there were some elderly people for whom a public bus service was unlikely to provide a real improvement in their mobility. This would be the case for those who would be physically incapable of using buses, even if the service was appropriate to their needs in other ways. The comments reported in Chapter 8 showed that reaching the bus stop from home, waiting for, and climbing aboard buses could represent serious barriers for these

people. Norman (1977, p.45-46) suggested that in order to make the bus a suitable mode of transport for these individuals, it would be necessary to redesign vehicles, and revert from one man operated services to the driver and conductor arrangement. It would also be necessary to extend the bus route network further into residential areas where elderly people live. Such developments seemed too costly to be realistic possibilities, since the cost of new vehicles is very high and the costs of manning and operating the existing bus service already presented problems for the bus company in East Kent.

For those respondents for whom the main barrier to bus travel appeared to be the costs of fares or the infrequency of services, intervention through the bus service might be the most direct and effective method of dealing with the deficiencies of spatial access which they perceive. The bus companies, however, are faced with the problem of declining use of buses and rapidly escalating costs. These have created for the bus companies in Kent the financial difficulties discussed in Chapter 2. The ability of local operators to provide a cheaper and more frequent service depends to a large degree on the limitations of the resources which are at their disposal.

At the time of this study the fare concessions made to elderly people were less generous than those available in other parts of the country, and were considered by many of those interviewed to be inadequate. However, the financial circumstances of the operator made increases in concessions difficult to achieve, particularly in areas such as Broadstairs and Whitstable, where the proportion of elderly people was so high. Possibly a differential rate of concession might be made available to those living in more isolated areas with health and mobility characteristics shown by this study to increase the likelihood of spatial access difficulties.

The potential for intervention through voluntary services

The various types of voluntary transport scheme and the problems of operating them were considered in Chapter 2. The voluntary minibus

services are not designed only for the specific requirements of those needing to use local medical facilities, and it would be particularly difficult to meet unpredictable demands for general medical care due to unexpected illness. For such cases, car services for individual passengers would probably be more appropriate.

Regular minibus services are, however, suited to facilitating access for the elderly to local centres for purposes such as obtaining repeat prescriptions for chronic conditions and attending surgeries or clinics for prearranged appointments. Voluntary transport also has the advantage of greater flexibility offering the possibility of operating a service which is almost door to door, and therefore more attractive than ordinary buses for those who find it difficult to walk to a bus stop and wait there. It would seem that such schemes would potentially be most suitable for meeting the needs of those unable to use a bus. However, in the study, some respondents were using minibus services run by voluntary organizations simply because the public transport provision in their area was so inadequate.

The evidence in Chapters 8 and 9 showed that at present, relatively few respondents from Whitstable used the voluntary minibus service for travel to the doctor's surgery, although several of them used this service regularly for access to shopping facilities. The relatively long distance separating the health centre from the day centre used as a pick-up point for the minibus service, combined with the failure of respondents to arrange appointments on the day for which minibus transport was available may partly account for this observation. This study showed that journeys to surgeries exceeding a mile were significantly associated with perceived difficulty of access amongst respondents. Thus to be serving all those areas where need is likely to be high, the service would need to be extended to provide for a larger residential area closer to the centre of town than that already covered.

Not only can voluntary minibus services provide a service designed specifically for the elderly to meet some of their special needs; they can also, to some extent, be operated by the elderly. Such a system provides the opportunity for the elderly, particularly younger more active retired people to cooperate together in providing assistance to others in the same way that many already do independently by lift giving, to overcome some of the problems of mobility faced by this age group. For example, one of the elderly men interviewed at the day centre was a minibus driver for the voluntary scheme. However, because of the effort and commitment required for such schemes to succeed, the number of people able to assist is limited. A social worker to whom I spoke in the course of the survey work suggested that elderly people in general should perhaps be more committed to helping themselves with respect to service provision. Possibly the failure to do so may have arisen in some cases from a lack of identification with the community and a feeling of isolation as a social group. This feeling was indicated by the fact that many of the elderly respondents interviewed tended to identify with elderly people in other parts of the country as reference groups, rather than measuring their circumstances against those of other groups within their own local community.

The three alternative types of transport considered, therefore, have potential of differing kinds to provide services for elderly people with inadequate access to local facilities, if further social resources were invested in them. The ambulance service would provide to some extent for those needing special outpatient treatment at hospitals and clinics, although as a means of transportation it would have considerable limitations and would be unsuitable for travel to local facilities such as GP's surgeries, chemists and chiropodists. The public bus service, if it were made less expensive for the elderly and more frequent, would be a more effective means of access to the whole range of local facilities for those

who were physically capable of using it, and who lived in areas served by bus routes. The role of voluntary transport schemes would be most effective in providing for those unable to use the bus and those living in particularly isolated areas poorly served by buses. Coordination with the health service organization with regard to appointments would also be necessary for the service to be effective in making health care more readily accessible. The further improvement of these three transport alternatives to fulfill this potential would, however, involve greater integration of planning in the different public and voluntary service sectors than exists at present, a requirement which is discussed in the following section.

THE NEED FOR GREATER INTEGRATION IN PUBLIC SERVICE PLANNING

In Chapter 2 attention was drawn to the recent concern at the central government level over whether or not expenditure on health service provision is in fact making health care more accessible to those for whom it is intended. The evidence from this study suggested that interventions designed to make more and better health services accessible to the public were not always viewed by the population as achieving that aim. Respondents'views on the introduction of the health centre system in Whitstable illustrated this point. Several interviewees felt that while the facilities at the centre were more sophisticated, they were not perceived as improving the health care services available to some elderly people who need them. In some cases, the perceived availability of health care had been reduced since the establishment of the centre, because it was spatially inaccessible, especially by comparison with the surgery locations it replaced, and because the appointment system limited ease of access. Perhaps if a greater effort had been made initially to coordinate transportation services with the new mode of health care provision, the health centre would have been seen to have performed better in improving access to health services. If central

government is really concerned with the actual performance of primary health services it is important to ensure that the necessary support to health facilities is provided through the other service sectors such as public transport and the voluntary agencies to guarantee access to health facilities for all those needing them. This may involve additional expenditure of resources in these related service sectors to improve access for certain population groups. This expenditure should be considered as part of the social cost of making health care available to all in proportion to their medical need.

THE METHODS USED TO ASSESS SPATIAL ACCESS

Some conclusions can also be drawn relating to the value of alternative techniques of assessing equity in spatial access to health facilities The techniques used to study the spatial accessibility of primary health care facilities for the study population were based on a model of spatial access to health care proposed in Chapter 4. This called for analysis of the spatial organization of service facilities and of the characteristics and perceptions of the service population. Three techniques were employed. First, Location-Allocation analysis was used to investigate the distribution of surgeries with respect to the entire population of the study area. Secondly, an analysis of qualitative survey material from individual respondents' perceptions was carried out. Finally, a quantitative analysis of respondents' perceptions and characteristics was conducted. These three research methods are considered separately here

The location-allocation procedure enabled an analysis of the spatial efficiency of the distribution of surgeries in achieving the two planning objectives of reducing as far as possible the aggregate travel costs and the variation in travel costs between individuals. The analysis demonstrated for example, the greater travel costs associated with provision of health care through a single centralized health centre for a relatively widely spread population in Whitstable, as compared with the system of several separate practice surgeries serving the population of Broadstairs where the areal extent of the MPA is more limited. The findings suggested that access difficulty could be anticipated for a larger proportion of Whitstable residents than for those from Broadstairs. The analysis also suggested that at the level of the Health District, spatial inefficiencies in terms of the models used were likely to arise due to the distribution of service capacity between doctor's surgeries.

It was found to be necessary to collect original material from clients themselves by conducting an interview survey in order to obtain the data required for an assessment of the factors most relevant to individual's spatial behaviour and perceptions. The interview survey enabled the researcher to record the opinions and perceptions of individuals and to relate these to other characteristics of the respondents in a way which would not have been possible by a secondary analysis of existing survey data for other towns. The discussion in Chapter 7 explains how the pilot survey indicated that fairly simple verbal methods were the most effective way of eliciting useful responses from this type of interview subject. The original survey data was of particular value since it related to individuals judged particularly likely to have access difficulty, although it was also possible to compare the characteristics of the respondents with those of 'average' elderly people reported in larger national surveys.

The material obtained from the survey enabled two types of analysis to be performed. These were (a) a compilation and interpretation of qualitative material in the forms of comments and responses made by a number

of individual interviewees, frequently of a spontaneous nature, and (b) an aggregate and mainly statistical analysis of the information given by respondents about their social, demographic, health and mobility characteristics, and their travel behaviour and perceptions involved in the use of local facilities.

The first mentioned approach seemed to be the most fruitful in terms of explaining the perceptions of access and behaviour in space of the respondents. The material provided evidence of perceived difficulty of spatial access to local primary health services and other facilities and went some way towards explaining the circumstances causing these difficulties. Such material is likely to be of value for planning purposes since, as Norman (1977, p.46) points out, younger, more mobile administrators may not be readily able to envisage the circumstances which may produce difficulties for the aged. The comments discussed in Chapter 8 reveal not only perceived access problems, but also a feeling of relative deprivation among the respondents who considered that their experiences reflected a situation which was unjust. Some explanation of the perceptions of the respondents was provided by evidence for restricted mobility and limited action spaces of the elderly people interviewed, which resulted in dissatisfaction with their circumstances, with the location of health facilities and with the public transport system.

The analysis of aggregated responses included an application of analysis of variance techniques to test for the associations anticipated by a hypothetical model of factors likely to influence perceptions of the accessibility of the general practitioner's surgery. This analysis was of interest in particular because it provided some evidence of a correspondence between perception of difficulty and respondents' accounts of their circumstances which might be expected to effect their experience of spatial inaccessibility. In particular, distance to be travelled and travel time appeared to be associated with access difficulty in the expected way, suggesting some basis for perceived difficulty which would be recognizable

to an administrator as legitimate and explicable in terms of the circumstances of the elderly individual. The model, in so far as the empirical evidence supported it, was therefore, useful in providing some explanation of consumer perceptions. However, the analysis also suggested modifications which would improve the explanatory value of the hypothesised model. For example, the aspirations and expectations of the respondents and their health condition also played a part in determining their perceptions. In the time available, and given limited resources, it was not possible to collect more detailed information on the general well being of respondents in addition to the range of other data obtained from the interviews. However, in a larger research project on this subject it would have been valuable to employ further measures of respondents well being, in order to investigate more fully the relationship between this factor and the geographical experience of the elderly.

Thus the qualitative survey material was the most useful instrument employed to produce evidence which permit explanation of the problems of the spatial accessibility of health facilities. This conclusion supports the assertion made by writers such as Cullen (1976) that a consideration of individual responses without recourse to quantitative methods may be the most profitable approach to the study of perception of spatial opportunities and spatial behaviour. While conceding that "certain social institutions persist and effect the lives of all of us" in a way which may be usefully investigated by studying behaviour of aggregate populations "at the macro-level", Cullen criticised such studies for their failure to treat mental images as active sources of behaviour and change in their own right, and their tendency to assume that behaviour is simply a "passive response to environmental conditioning, rather than a result of the motives and intentions of the individual". He suggested that,

> "...understanding of social action requires an explanation in terms of the motives, intentions and subjective constructions of the situation typical of the action involved." (Cullen, 1976,p.407)

Spatial mobility and the quality of life in old age

The conclusions drawn from the evidence in Chapter 8 illustrated the fact that spatial mobility can be an important limiting factor for life satisfaction in old age. This supported assertions by authors such as Allsop (1980) that there is an important link between availability of transport and the quality of life. Discussion in earlier chapters demonstrated that it could be argued that variations observed in spatial access to health facilities do not justify expenditure by society to improve accessibility. Theories postulated by other authors would suggest that those who continue to live in seaside towns with relatively poor access to facilities must do so because for them the benefits of that location outweigh the disadvantages. However, the evidence of the survey would seem to provide some grounds for rejecting an assumption of free choice of residential location. The results reported in Chapter 8 showed that many respondents were unsatisfied with their residential location but powerless to change it.

The evidence from the survey suggested that in some cases the choice of retirement home was ill-considered and has been subsequently regretted by the respondents. It is generally agreed, and this study confirms the view, that old age can yield greater satisfaction if the circumstances and attitudes of the elderly permit a continued involvement for as long as it is desired, in activities normal to life at a younger age, rather than causing a premature disengagement. The need to plan carefully for retirement has been stressed by many authors and there is some evidence that those who have retired recently may have incorporated such planning in their decisions (Dyson, 1979). However, this survey has shown that the problem still persists of elderly people who are 'prisoners of space'. It seems likely that elderly people in the retirement resorts will continue to suffer from a failure to adjust to their circumstances, partly as a lack of forsight of the sort of experiences and difficulties they may expect in later life

in such communities. As one elderly respondent put it;

"They come down to Whitstable to die and then forget what they came for."

Some of the problems recorded here might be avoided by other elderly people if they, and also younger members of the community in towns such as these, viewed retirement as a new phase of life rather than a period of disengagement and planned for their changing requirements accordingly. The spatial accessibility of local facilities, including those providing primary health care should figure as one of the important considerations in decisions made by older people about their choice of retirement home.

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