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# Future role of the District Health Authority: Assessing needs for services and setting priorities

by

Brian Ferguson and Steve Ryder

## **DISCUSSION PAPER 87**



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FUTURE ROLE OF THE DISTRICT HEALTH AUTHORITY:  
ASSESSING NEEDS FOR SERVICES AND SETTING PRIORITIES

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Brian Ferguson and Steve Ryder

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## ABSTRACT

The purchaser/provider split within the NHS has highlighted the role of District Health Authorities (DHAs) in assessing health needs and buying services to meet those needs. This requires a consideration of what is meant by "need" and how it relates to a system of priorities for health care provision. In the long-term it is to be hoped that DHAs have at their disposal cost-effectiveness information relating to a wide range of interventions, enabling them to make priority decisions. In the short-term, however, a less ambitious aim is to ask what information is currently available which could inform the purchasing role. In areas where data are clearly deficient, this could involve assessing the potential usefulness of available information, assuming that underlying data could be improved.

The starting-point for the project upon which this paper is based was therefore to establish the baseline characteristics of participating DHAs' resident populations, using data already available nationally and locally, supplemented by local survey work where applicable. The aim was to evaluate existing data sources, examining their usefulness in assessing health needs and in making the link from needs to service provision. There is of course no magical formula which translates the identification of needs into what health care services should be provided. Nevertheless this is exactly the challenge faced by those who will be involved in the contractual process.

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1. INTRODUCTION

In October 1989 York Health Economics Consortium (YHEC) was commissioned to undertake a major piece of work relating directly to the implementation of the White Paper. This work was supported by the Consortium's three member Regions and by ten District Health Authorities within those Regions, listed below:

Northern RHA
Durham Newcastle North West Durham Northumberland
Yorkshire RHA
Airedale Dewsbury Pontefract
Trent RHA
Bassetlaw Central Nottinghamshire Nottingham

Draft Final Reports for Phase I of the project "Future Role of the DHA: Assessing Needs for Services and Setting Priorities" were circulated to participating Regions and Districts between June and August 1990. Finalised versions will have been distributed by mid-December 1990. Each of the Final Reports (ten in total) is broadly structured in ten sections, with supporting appendices produced as a separate document.

The main Reports are available in loose-leaf format to enable users to refer easily to sections of particular interest. The outline structure of the Reports reflects the pragmatic approach adopted in Phase I which identified a number of distinct, but related, tasks to be undertaken. In total, seven discrete areas of analysis were

carried out, and these form the substance (Sections 2-9) of the Phase I Reports. The Section headings are listed below to summarise the content of the Reports:

- Section 1: Introduction
- Section 2: Economic Framework
- Section 3: Faculty of Public Health Indicators
- Section 4: National Data Sets
- Section 5: GP Surveys
- Section 6: Access Study
- Section 7: Outpatient Survey
- Section 8: Health Service Indicators
- Section 9: Analysis of Hospital Activity Data
- Section 10: Concluding Comments

The Appendices to each Report contain a great deal of detailed analysis for each district and it is not the intention of this Report to compare findings across districts. To do so would involve compiling a document in excess of 500 pages. Much comparative analysis of DHAs within Regions is undertaken in the Phase I Reports. Instead, this Report is intended to achieve the following objectives:

- (1) to summarise the lessons learnt and issues addressed in Phase I, drawing on the experience from ten DHAs;
- (2) to highlight possible links between different Sections of the Final Reports.

Both of these objectives require an evaluation of the usefulness of existing information sources and by implication a consideration of information requirements to support the purchasing role. At different stages throughout this Report, attempts are made to provide "prompt lists" for DHAs which set out issues to be addressed and reflect lessons learnt from Phase I. Before doing so, it is useful to reiterate the aims of Phase I and to give a brief position



statement of where the Phase I work has led, from the perspective of YHEC.

The explicit aims of Phase I were twofold. Firstly, the project aimed to establish the baseline characteristics of participating Districts' resident populations, using data already available nationally and locally, supplemented by local survey work where applicable. Secondly, it aimed to evaluate existing data sources, examining how useful they are in assessing health needs and in making the link from needs to service provision. There is of course no magical formula which translates the identification of needs into what health care services should be provided. Nevertheless this is exactly the challenge faced by those who will be involved in the contractual process.

Distinctions have been drawn elsewhere between identifying the information required for health needs assessment, and that required by purchasers in drawing up contracts. From the perspective of this project, these are logically one and the same thing, with the only useful distinction being that between the short and long term. If health needs assessment is seen as distinct from the contractual process, then there is little hope of moving away from the existing supply - dominated system.

Phase I was a starting point in the process of health needs assessment. It asked the question "what information do we now have which could inform the purchasing role?" To reiterate, it was concerned with examining existing information sources. In areas where data were clearly deficient, this involved assessing the potential usefulness of the information assuming that underlying data could be improved.

In broad terms Phase I has achieved the following:

- \* started to describe districts' resident populations in some detail;
- \* examined and described existing patterns of utilisation;
- \* identified patient flows and related these to accessibility issues;
- \* assessed the extent to which existing socio-economic data could be used by districts;
- \* offered a diagnostic classification of activity "across the board" which could be used to compare activity patterns within and across districts.

Above all there are two important features of the work which should not be overlooked:

- 1) Phase I has collated a great deal of information on a wide range of issues which are directly relevant to the contractual process;
- 2) Phase I has presented that information in a way which is relevant to the world post-NHS and Community Care Act, recognising the information needs of purchasers and providers separately.

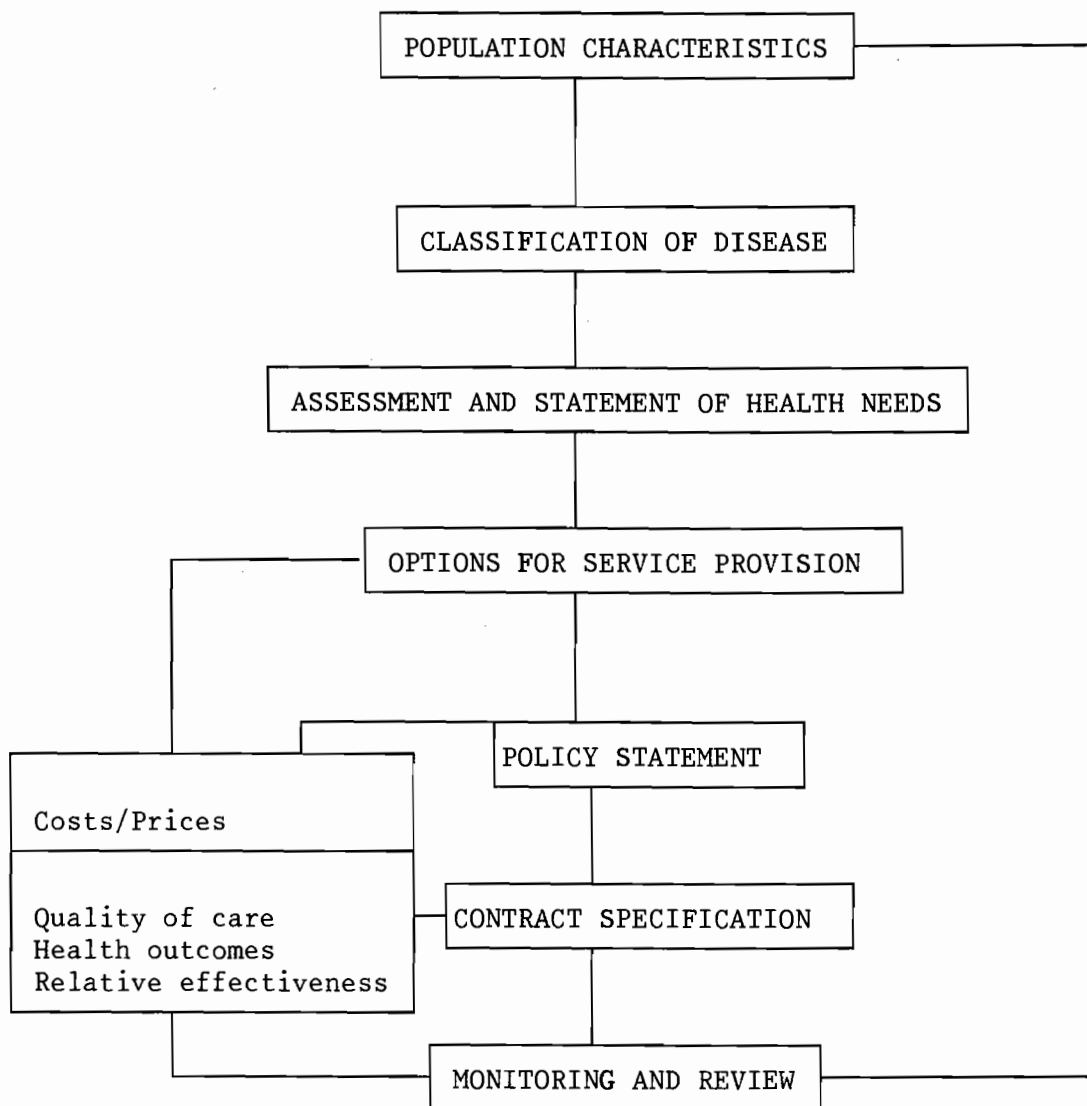
On (1) above, it is again necessary to emphasise that Phase I is a starting point. It represents a relatively thorough review of many currently available data sources, which have the potential to inform work on assessing health needs. Many of the links between different areas of work undertaken in Phase I still have to be explored, and "first time analyses" have pointed to areas where further investigation is required.

On (2) above, the evaluation of information sources has been placed within the context of the purchaser/provider split. This has been carried out from the economist's perspective which attempts to explain some of the interactions between supply and demand factors and their relationship to health needs assessment. Such an economic framework relies upon an operational definition of need ("capacity to benefit") which may not be ideally suited to other disciplines such as Public Health. It does, however, allow the logical leap to be made from health needs assessment to providing services to meet those needs. What is missing is the wealth of cost-effectiveness information necessary to permit judgements about the relative impact of different types of health care intervention.

On this final point, a separate strand of work which has been developed in Phase I relates to the development of a framework of thought and analysis which will aid DHAs in making priority decisions within their future role. This framework is summarised in a separate report (available from YHEC) which is focused towards developmental cost-effectiveness work in selected areas, which is the proposed content of Phase II of this project.

For the purposes of Phase I, the conceptual structure can crudely be described as a series of building blocks, working through from description of resident population to statements of policy (with the end result being clearly stated in terms of final outcomes, ie. improvements in health status) and specification of contracts. Figure 1 overleaf outlines this structure which underpins the analysis undertaken in Phase I and proposed for Phase II:

FIGURE 1



## 2. ISSUES ADDRESSED AND LESSONS LEARNT FROM PHASE I

### 2.1 ECONOMIC FRAMEWORK

This Section of the Final Report was designed to set out the general economic framework within which specific Phase I analyses were undertaken. It is an atypical Section in the sense that it does not contain any empirical analysis. The intention here is to highlight some general principles which economists would consider important in discussing health needs and the operation of markets for health care services. For completeness, the "Economic Framework" Section of the Final Report is divided into five sub-sections, listed below with a brief description of contents:

Section 2.1 - Introduction

Section 2.2 - Economics of Health and Health Care - describes some of the general characteristics of health care markets and the relationship between different concepts of need and health service use.

Section 2.3 - Needs, Priorities and the Current Structure and Process of Health Care Delivery - examines incentive structures, both for patients and NHS staff, which determine how current needs are rationed.

Section 2.4 - Changes to Market Structure - examines the effect which NHS reforms may have upon the economic structure of the market.

Section 2.5 - Information Requirements - discusses the areas of specific study in Phase I and their link to the economic framework.

What then are the issues which economists would consider important to the DHA in its future role as purchaser?

*\* Definition of Need*

There are many different taxonomies of need. The definition which underlies this project is "capacity to benefit". It is based on the belief that an individual cannot "need" something which does not do any good. In health terms, "doing good" is concerned with improving individuals' life expectancy and/or quality of life. The implied definition of "efficiency" is therefore: either maximising those health benefits from a given budget, or achieving a given level of health benefit at least cost. Finally, needs are relative: economists are concerned with opportunity costs, which implies that, given a fixed resource constraint, some individuals' needs will be satisfied at the expense of others.

*\* Distinction between Health and Health Care*

Health in itself is not a commodity which can be bought or sold. Health care services, on the other hand, are soon to be purchased and provided in the market-place, where issues of price and quality will determine the quantity of service traded. Health care services, however, are only one determinant of health status. This is important because DHAs, responsible for the needs of their resident populations, can only influence some of the factors affecting health status.

Hence there is a need for DHAs to identify not only what they are responsible for, but also the areas for which they are not responsible. To take an old example, an important cause of head injuries and traumas are road traffic accidents. DHAs as purchasers will contract to purchase A&E and other health care services to meet the needs of these cases. What has the most impact on the health status of these cases is, however, the preventive measure of seat-belt legislation. Making the distinction between health and health care simply draws attention to the fact that variables such as housing, education, legislation and income have an important impact on health status. Section 2.3 below discusses this in relation to

how informative national surveys are in providing data on such variables.

*\* Cost of Health Care to the Individual*

The concept of opportunity cost is again important here. In the UK, individuals face a zero money price of health care at the margin. This does not mean, however, that the consumption of health care services is costless to the individual. The opportunity cost of an outpatient attendance, for example, will vary by social class. Individuals who are paid by the hour, rather than salaried, will face a direct loss of earnings. This is just one feature of accessibility to primary and secondary health care services. There are also educational and geographical barriers which affect the take-up of services. Geographical accessibility is discussed in Section 2.5 below.

*\* Rationing Mechanisms*

Demand for health care services may not be unlimited but at any point in time it will certainly outstrip supply. This is inevitable when some parts of the NHS are cash-limited. At present waiting lists are the most obvious sign of rationing, but there are other administrative and professional means of curtailing the use of health care services. GPs and consultants, for example, make rationing decisions every day in deciding who receives and who does not receive treatment.

Economists have for some time advocated the need to make the criteria for rationing more explicit. This relates back to the capacity to benefit principle: in other words, where are the greatest marginal benefits to be gained from the available budget. One of the key areas for research here is the relationship between outcomes (in terms of life expectancy/quality of life changes) and patient characteristics. These characteristics might include age, sex, social class and some measure of clinical severity (proxied to

some extent by diagnosis).

In the future, when DHAs are faced with effectiveness information in relation to patient characteristics, decisions will be made according to where the greatest health gains can be achieved from available resources. Such decisions are made implicitly by clinicians at the moment. For example, to whom would a cardiac surgeon offer a heart transplant, to a 25 year old non-smoker with cardiomyopathy, or to a 60 year old smoker with ischaemic heart disease?

*\* Separation of Supply and Demand Factors*

In a conventional commodity market firms can readily estimate the supply and demand for their products. By doing market research they can estimate demand at different prices, and based on a number of factors will be willing to supply different quantities of their products at those prices. The market will clear through the price mechanism and demand will equal supply for a given quality of product. This textbook model of the world assumes, among other things, that the consumer has perfect information upon which to base these rational choices.

The market for health care services is different in many ways. One of the most significant differences is the lack of available information to the consumer, and even more important, the informational inequality which the consumer faces. That is, if a patient is told by his or her doctor that he or she requires an operation, how is the patient to make an informed decision about whether to go ahead with that operation? In general no information can be proffered by the doctor regarding the risks or benefits of intervention. Hence there is a clear agency relationship, whereby the patient relies upon his or her GP, for example, to make decisions regarding the "purchase" of health care services.

In short, it becomes difficult to separate out demand and supply



factors. Clinicians have considerable scope to determine patterns of service provision (a concept often referred to as "supplier-induced demand"). Similarly, GPs will not refer their patients if they know that a service is either not available or the waiting lists for particular procedures are too long. A final example is the presence of a local specialist unit, such as a renal transplant facility, which prompts local GPs to refer patients who would otherwise probably not receive the service. The influence of such supply factors on service utilisation is well-documented.

The challenge for purchasers is to identify not only the extent to which supply factors influence take-up, but also to identify other factors influencing demand. What are the effects of accessibility and socio-economic grouping, for example, on service utilisation? Some quantification of these effects is essential if there is to be any serious move towards a need or demand-led system.

*\* Degree of Competition*

Purchasers will be keen to assess the extent of competition for particular health care services. This is important because the extent of competition can be expected to influence providers' behaviour, in particular their policy relating to price and quality of service. The type of market structure will influence the type of competition which takes place: for example, a cartel of providers could be expected to compete on the basis of non-price factors. (Private hospitals place great emphasis on "hotel" features, for instance). The importance of quality information, as well as the cost information on which prices are based, cannot be over-emphasised in contract negotiations between purchasers and providers.

*\* Consumer Choice*

This relates both to the agency relationship and the degree of competition, discussed above. Consumers of health care services

will be influenced by GPs who, as their agents, will seek out the highest quality of care available, taking into account features such as location and waiting time. This would involve non-price competition between providers and depends for its impact upon the market structure (how many providers?) for the service in question.

Consumer choice also relates back to the concept of opportunity cost. DHAs as purchasers will be responsible for deciding where contracts for health care services are placed. One of the features which should be taken into account is the accessibility of hospital sites and outreach services to their resident populations. DHAs may wish to specify in contracts that providers must include provision for transport facilities for residents in the more remote parts of their districts, and the contract price will reflect this. Indeed providers may compete whereby one offers to supply the service at the same price as another, but is willing to include "free" transport to certain groups of the DHA population. Consumer choice will be affected by all of these negotiations, and the relative power of DHAs, GPs (whether fund-holding or not) and providers will be all-important. The key point is that DHAs should be aware of how all these different features interact - in short, will the new market really "work for patients"?

## 2.2 FACULTY OF PUBLIC HEALTH INDICATORS

Section 3 of the Final Report provides a commentary on the indicators which are included in the Faculty of Public Health Common Data Set (CDS). It also presents some illustrative analysis on selected indicators across Districts within each Region, providing both values and rankings. Some time series analysis is undertaken on selected indicators for the five-year period 1984-88. The four main indicators upon which analysis is based are:

- (1) total deaths by cause
- (2) total deaths under age 65 by cause
- (3) years of life lost to age 65 by cause
- (4) years of life lost to life expectancy by cause

The causes of death are the eight "major" ones referred to in the CDS, namely - all malignant neoplasms, malignant neoplasm of lung, malignant neoplasm of breast, malignant neoplasm of cervix, ischaemic heart disease, cerebrovascular disease, motor vehicle traffic accidents and suicide.

It should be said that the purpose of the Public Health CDS does not exactly correspond with the focus of this study. The CDS was originally produced to assist Directors of Public Health with the preparation of their Annual Reports, and provides a set of indicators which could be compared across Districts and Regions. The focus of evaluation here, on the other hand, lies in asking the question how useful is the CDS in informing the process of assessing health needs and priorities for services. Clearly this focus is not distinct from the production of Annual Reports but does place more emphasis on the contractual process. Directors of Public Health will take a wider perspective in assessing factors which influence health, such as environment and deprivation. Those factors will be more under the control of local authorities and highlights the fact that health care services have only a limited capacity to bring about improvements in health.

A number of points can be made about the Public Health CDS in relation to its usefulness in informing health needs assessment and health care policy. These relate to the issues of indicator selection, comparability and targets.

*\* Indicator Selection*

There are clear dangers in choosing any set of indicators in that it automatically directs attention towards reducing rates associated with those indicators. If the death rate for cervical cancer is identified as an indicator of importance, an obvious question will be: "how does my district compare with other districts?" By implication, if it compares unfavourably, there will be calls for screening programmes and resources will be switched towards that particular health care problem.

Clearly the availability of information on particular diseases will also influence the choice of indicators. There are little data on, for example, socio-economic factors, with only a Jarman 8 score being included. The delay in producing indicators relating more closely to morbidity and quality of care means that the CDS has a strong emphasis on mortality. This is difficult to avoid without more general improvements in health data collection. Nevertheless, there is a danger that the reliance upon mortality figures may reduce the prospects of achieving improvements in other dimensions of health.

*\* Comparability*

One of the major advantages of compiling a CDS should be to ensure comparability across districts. This objective is more likely to be valued by Regions and the Department of Health with their overall monitoring role than by districts. Making comparisons across districts is problematic. District boundaries are somewhat artificial and population size varies widely, as does the composition of resident populations in terms of age, sex and socio-

economic factors. For direct comparability of figures, adjustments would need to be made to some figures. It would also be useful for guidance to be provided on both the validity of comparisons across districts and a methodology to express the variations found.

It is also worth pointing out that the data required for assessing health needs or writing annual Public Health reports should be focused, at least in part, upon variations within a district. There is no such information in the CDS. This is not intended to be a criticism of the CDS, which can only do so much and is still evolving. Rather, it is a reminder that districts will be keen to identify health variations within their own boundaries, as well as making comparisons with figures from other districts and regions.

A final point to make about comparability is the simple one that many of the indicators provided are of particular use when viewed over a period of time. In short, time series analysis is likely to be more valuable than cross-sectional analysis. Examination of trends in particular indicators will become more valuable as data for further years emerge.

*\* Targets*

Although, the full range of indicators may be useful for Directors of Public Health, only a more limited set relates to health care policies. While targets on some diseases provide useful policy goals, the ability to achieve them will depend upon the initial prevalence and incidence of the disease. A reduction of 15 per cent in cancer deaths may be easier to achieve, for example by reducing smoking rates, in some areas than others which already have low rates of disease, good treatment facilities and a low level of risk factors. Also, achieving targets does not necessarily mean that improved health status could be cost-effectively achieved by further reductions.

The emphasis upon population rates as targets may serve as a useful

comparative yardstick but it does run the risk of focusing upon total, rather than marginal, needs assessment. Concentration upon prevalence and incidence rates implies that "need" is equated with those factors. Instead, economists have argued that resources should be directed towards those areas where there is most additional capacity to benefit. This is the framework within which purchasers of health care services should operate - clearly the main constraint is information. "Efficiency" within such a framework is defined as *either* maximising benefits (quality of life and/or life expectancy) from a given budget, *or* achieving a given level of benefit at least cost. If DHAs are to be accountable for utilising resources efficiently, then there needs to be a clearer description of what marginal health benefits can be achieved from given resource constraints.

To illustrate some of the points made above in relation to policy targets, it is useful to focus upon two of the indicators which were analysed in detail in the Phase I Reports. These were number of deaths and years of life lost (YLL) for the major causes described earlier. If those causes are plotted on a two-dimensional graph (YLL on the vertical axis and number of deaths on the horizontal axis), then as expected ischaemic heart disease and all malignant neoplasms will appear in the north-east of the diagram. That is, they account for high numbers of deaths and high YLL. These two causes, for any district, would always dominate all other causes. Comparisons become much more difficult as one moves south-west in such a diagram: for example, neither suicide nor lung cancer may be expected to "dominate" the other. Suicide may well account for fewer deaths overall but contributes to more YLL than lung cancer. Clearly there is a trade-off between numbers of deaths and YLL.

If a district only had information on those indicators to assess needs and priorities for services, then it would direct resources at each of the health problems in turn, moving from north-east in the diagram (high numbers of deaths, high YLL) to south-west (low numbers of deaths, low YLL). Such a policy would of course be

nonsense, but does in fact follow from defining "need" as population prevalence. It would essentially treat needs as absolute: all of the greatest needs would be met first, then all of the next greatest needs, and so on. In practice needs are relative and resources will be directed at all of these health problems at the same time. The issue for a district then becomes one of how much resource should be devoted towards each cause of death. For example, how much resource should be directed towards breast screening programmes as compared with treatment and prevention of ischaemic heart disease? This question can only be addressed once further dimensions are introduced. In practice, these dimensions will involve examining the relative costs and effectiveness associated with different causes of death.

Finally, the Public Health CDS has helped to illuminate issues associated with the boundaries of care. Presenting data on YLL, for example, does give prominence to causes of death such as suicide and motor vehicle traffic accidents. This returns to the points made earlier about factors influencing health status. Motor vehicle traffic accidents are a major cause of YLL about which health authorities can do very little. DHAs must address the question "should we be doing more", and if so, where does health authority responsibility begin and end with respect to the responsibilities of Local Authorities and other agencies.

In summary, two overwhelming issues arise from consideration of the Public Health CDS. These are firstly the need to supplement such data with information on relative costs and effectiveness, and secondly the definition of boundaries of care.

## 2.3 NATIONAL DATA SETS

The Public Health Common Data Set contains only a limited amount of data on the characteristics of district populations and their health status. It was decided, therefore, to examine how districts may use other nationally collected data sets. For most national surveys the only geographical breakdown is for main regions, hence the data cannot be used to provide district-specific information. However these data sets could be valuable in:

- \* relating locally collected data to national patterns.
- \* evaluating various indicators of health needs, population characteristics and deprivation.
- \* predicting measures of health status and health service use on the basis of social and demographic characteristics of individuals and areas.

Three specific data sets were used:-

### *GENERAL HOUSEHOLD SURVEY (GHS)*

This is an annual survey of private households which contains information on:

- (a) self-reported health status and presence of long-standing illness;
- (b) numbers of self-reported GP consultations, inpatient stays and outpatient attendances;
- (c) a wide range of socio-demographic and economic indicators relating to the individual or household.



### *HEALTH AND LIFESTYLE SURVEY (HLS)*

This survey contains data on a much wider range of questions about health status and behaviour than can be obtained from the GHS. There is, however, no information on the use of health services by respondents.

### *SMALL AREA STATISTICS (SAS)*

These provide a detailed geographical breakdown of various socio-demographic and economic characteristics but contain little data on health. In order to consider some of the variations in population and area characteristics within districts, a selection of variables was obtained at electoral ward level. Data from the SAS were used to construct existing deprivation indices and an alternative classification. These were then analysed in conjunction with mortality figures and HLS data.

The over-riding objective in this Section of the Final Report was to produce a classification which meaningfully described the socio-demographic and economic composition of participating districts. This classification could then be examined in association with mortality and health status variables at electoral ward level, using the data sources described above. Relationships between deprivation and health status are complex. In the short-term some correlations between deprivation and health status/health service use may be all that is required by districts as part of the planning process. However, to improve health status over longer periods and to set priorities for contracting requires a more careful examination of causal relationships. This longer-term objective was outwith the scope of the current study, but attempts were made to devise a useful classification of wards within districts and to examine the association with health status measures.

Section 4 of the Final Report contains a review of current indices of deprivation and their use. The four main measures of deprivation

in use are the Jarman, Townsend, Department of Environment and Scottish Development Indices. These are all based on 1981 Census data but comprise different indicators and use different methods of index construction. A number of statistical issues, discussed at length in Section 4 of the Final Report, have been raised in the debate about the choice of deprivation indices. Considering the statistical problems occurring with existing measures, an additional index was formed using the variables representing the four dimensions of material deprivation identified by Townsend. These four dimensions are:

- \* unemployment
- \* over-crowding
- \* lack of a car
- \* level of non-owner occupation

The statistical technique of cluster analysis was used to derive a classification of electoral wards in terms of these four components of deprivation. The analysis revealed seven discrete clusters, ranging from Cluster 1 (low levels of deprivation) to Cluster 7 (high levels of deprivation). This analysis recognises that deprivation is multi-dimensional and as such it is an intuitively difficult technique to grasp. For example, a comparison of Clusters 3 and 4 may reveal that the score is the same on some dimensions but higher in others for Cluster type 3. Furthermore, the difference between Clusters 1 and 2 may be more or less marked than that between Clusters 5 and 6: that is, differences between clusters are not linear.

In fact, the cluster analysis revealed very clear divisions between the less deprived (Clusters 2,3,4) and more deprived (Clusters 5,6) wards, rather than between the individual cluster types. That is, the analysis was useful in identifying particular pockets of deprivation within district boundaries. This result was similar to that obtained when using other indices of deprivation, which are equally more certain in identifying areas of worst deprivation than

generally providing a finer classification of the more prosperous areas. The testing of the seven-cluster solution does suggest that the four Townsend factors could be used successfully in this way. Districts may wish to update the information on these factors to reassess the geographical picture of deprivation within their boundaries. The analysis here would support the use of these indicators to "type" areas rather than to devise indices which may yield possibly misleading information about one ward compared to another.

Summarising thus far, the above clustering techniques had a useful DESCRIPTIVE purpose in classifying wards in terms of measures of deprivation. The value of this can be seen later in Section 3 where the links between this analysis and other information sources are discussed. The analysis also had a PREDICTIVE purpose. The clusters, standardised for age and sex, were regressed against "outcome" variables from the HLS (for all electoral wards in England and Wales). The resulting models were then used to predict health outcomes in the wards of each participating district. This use of expected values was seen as a useful bridge between survey data on self-reported morbidity and socio-economic conditions. Predictions for specific districts were presented in the Final Reports and were also used in those districts undertaking the GP surveys. Full details of the procedures used to obtain these predictions are available on request.

Turning to analysis of the GHS, some of the questions repeated annually relate to self-reported health status and self-reported long-standing illness, disability or infirmity. The responses to those questions and other statistics from the GHS can provide a useful benchmark for local surveys as well as being a source for question design. The other data which are particularly useful relate to the use of health care services. Three of the questions which are routinely included in the GHS were used in analysis:

- \* During the last two weeks, apart from any visits to a hospital, did you talk to a doctor for any reasons at all, either in person or by telephone?
- \* During the last three months, did you attend, as a patient, the casualty or outpatient department of a hospital (apart from straightforward ante- or post-natal visits)?
- \* During the last year, have you been in hospital as an inpatient, overnight or longer?

It is worth noting two points about the above. Firstly, the categorisations of activity for GHS responses differ in a number of ways from NHS-generated data. In addition, data are presented on an individual basis and not by episodes of care. Secondly, no data are available on the symptoms or diseases related to health service use or self-reported health status/long-standing illness. Hence the data can only be used to consider the relationship between population characteristics and their total health service use. Ideally, constructing well-validated multivariate models could provide a useful tool for predicting health service utilisation. The results from such an exercise could be combined with local data and knowledge to provide estimates of different patterns of service usage. There are, however, a number of problems in constructing such models relating health service use to population characteristics. As discussed in Section 2.1 earlier, the use of services reflects supply as well as demand factors, a subject returned to in Section 3.

Some illustrative analysis was carried out on the GHS data for adults and for children, revealing some large variations in the use of health services by different socio-economic characteristics. For example, health service use declined as both household income and the number of consumer durables rose. Also, self-reported health status appeared to be the best discriminator of health service use. These results can only be regarded as illustrative and

could usefully be extended by multivariate techniques. It is important to highlight information as a constraint to the performance of such analyses. They can only be of relevance to districts if usable and timely information is available on the socio-demographic and economic characteristics of their resident populations. GP surveys of their patients, as undertaken in some participating districts in Phase I, are one means of providing some indicators of morbidity and other characteristics.

## 2.4 GENERAL PRACTITIONERS AND THEIR PATIENTS

### *\* Aims of the Section*

This Section explored the potential value of surveying general practitioners and their patients in order to provide proxies for local need. It is felt that such surveys might provide useful information on the morbidity levels within the community and could supplement local mortality data available in the Public Health Common Data Set.

Ideally, perhaps, full scale surveys of blood pressure, lung function and other physiological measures would provide hard factual information on morbidity levels within the community. It is, however, recognised that such surveys have important shortcomings in that they are expensive, require frequent updates and are not comprehensive (ie they can only provide information on a limited range of conditions).

Two separate surveys were designed by researchers at the Centre for Health Economics (CHE).

The first survey was primarily aimed at collecting information about the health status of individuals on GP lists. The expressed aim of this work was to gauge morbidity levels within the community at large.

One of the aims of the second survey was the examination of individuals' propensity to consult with their GPs. Data generated from this survey could be used to determine the characteristics which lead to consultation with a GP, for example the level and nature of illness, the distance from facilities and socio-demographic factors.

Ideally, information from both surveys would have been combined to assess whether "self-reported needs" were being met by provision of primary and secondary care. There were, however, practical problems

which limited the possibility of combining results. Not least of these was the fact that classifications of self-reported morbidity could not be made to correspond to medical classifications (as used by health professionals).

#### *\* Methods*

Pilot studies were undertaken in Derbyshire and York to assess "self-reported" health status. Questionnaires were issued to patients in practice waiting rooms whilst GPs were asked to keep consultation records on the same days. Despite acceptable response rates to these questionnaires, the study design was rejected because of the difficulty of getting information on the long-term health of the population, the problems of generalising from the sample to the population at large, and lastly because of the practical problem of GPs not always completing record cards on the same days as the distribution of patient questionnaires.

Following the problems highlighted by these pilot studies, it was decided that the health status survey should be conducted as a postal questionnaire which would be simpler and cheaper than that issued to patients in GP practices.

#### Survey of Patients

The measures used in the postal survey were carefully selected - particularly in respect of their known implications for service use and health education initiatives. Selected measures were as follows:-

- Self report on general health
- Height and weight data (for computing of Body Mass Index, BMI)
- Recent symptoms, both physical and psychological
- Current conditions
- Current chronic illness and incapacity

- Medical history (reports of previous condition)
- Level of use of GP and hospital services

These morbidity estimates could be used to predict the situation for the population of an entire DHA, as well as enabling comparison of areas within a DHA. Predictions were made by weighting the survey results to approximate the known socio-demographic profile of the general population of the DHA. The information generated in the postal questionnaires can inform the extent of linkage between population morbidity and service use. In addition the survey data can be compared to that found in the General Household Survey (GHS) and the Health and Lifestyle Survey (HLS).

Response rates to the survey were very encouraging (in some instances as high as 80%) and details of variation by practice are reported in the detailed survey.

#### Survey of General Practitioners

The second of the surveys, as already mentioned, aimed, amongst other things, to examine the propensity of individuals to consult their GPs. In this instance, GPs were asked to record information on the diagnosis and disposition of patients who consulted them. Check-sheets were designed which enabled GPs to record a variety of conditions for individual patients, as well as enabling them to record how many consultations were made for the same condition.

A variety of coding schemes were examined and eventually eighteen headings were selected. These headings are used by the Royal College of General Practitioners and are also compatible with the main International Classification of Disease Nine (ICD 9) chapter headings. The main reason for selecting these headings as opposed to others was the fact that unskilled research coders were relatively successful at matching reported diagnoses to one of the eighteen codes. This was not true for more complex classification systems (eg Read Codes) - which, if adopted in any future surveys, would require



more skilled (hence expensive) coders to be employed. In time, the requirement for a coding system might be by-passed through the use of advanced information technology, but this option is not yet available.

The sample size of GP consultations was limited to 100 per participating GP (or approximately four days' consultation in an "average" practice). For this sample size, GPs estimated that 2 hours of their time was needed to complete the consultation reports.

Referrals to hospital for inpatient, outpatient or day care treatments only result from a very small proportion of GP consultations (a figure of 5% was suggested by the GP surveys in participating districts). For this reason it is expected that very large sample sizes would be required to account for the wide variety of conditions experienced by hospital patients. As General Practices implement more computerised systems it is possible that data capture could become more complete - but it has to be recognised that overall information costs include General Practitioner time (ie fewer consultations) and the cost of coding, in addition to direct hardware/software costs.

*\* Details of the Study*

The introduction of the new contract for GPs unfortunately coincided with the request for practices to participate in the surveys of morbidity and propensity to consult. This meant that it was difficult to select GP practices which were representative of the DHA in terms of work practices and the socio-demographic characteristics of patients on their lists.

Nevertheless, attempts were made to cluster wards into groups with similar socio-economic characteristics and to use these results to build a picture of what morbidity patterns and consultation rates might look like for a whole district population.

## Survey of Patients

Although response rates from patients were encouraging, there are several practical problems associated with generalising results from the sample of patients returning the postal questionnaires. Firstly, it is suspected that those who replied to the questionnaires tend to be older and less healthy than the general population. Secondly, it was not always possible to recruit a sufficient number of practices to achieve full geographical coverage. This meant that some electoral wards tended to be under-represented in terms of returned postal questionnaires.

Other problems associated with study design are discussed in the Final Reports. Wherever possible, researchers at York attempted to adjust sample data to account for known population profiles in the district.

## Survey of General Practitioners

All of the surveys showed quite significant fluctuations in consulting patterns. Some of these are explicable, eg variations due to days of bad weather and school holidays, whereas others remain largely unexplained.

Numerous analyses have already been undertaken, some of which are listed below:-

- Reasons for visiting GP (including multiple reasons).
- Type of episode, ie are the reasons newly reported, historical or a combination?
- GPs' opinion of the severity of problem(s).
- Number of consultations resulting in a request for laboratory test (by type of test).
- Number of consultations resulting in a request for X-ray.
- Number of consultations resulting in a hospital referral.
- Disposition of patients after consultation (ie are follow up

consultations planned, and if so, on what basis?).

- Diagnosis of patient by type of condition.
- Diagnosis of patient by severity of condition.

*\* Results of Analysis to date*

In many instances it is very difficult to draw conclusive results from both surveys because of the limitations associated with sample size. This is particularly true when the relationships between primary and secondary care are examined.

However, some important themes appear to emerge from the participating districts. Perhaps the most significant finding is that levels of socio-economic deprivation appear to have little effect upon the distribution of consultations between the main disease groupings. For this reason the Report reinforces conclusions made elsewhere that consultation data in themselves are unable to "... throw any light on levels of need in different areas or on variations in accessibility and acceptability".

This has important implications for what can be expected from computerised primary care databases, putting special emphasis on their ability to produce statistics by patient and not just by consultation or episode. Patient-based information appears to have very limited use for estimation of need within the wider community, but may provide "operational" benefits to General Practice management which have not been considered in this project.

The case for exploring other forms of morbidity measures such as self-report health surveys is assessed in the supplement to the main report produced by Dixon (*et al*) from CHE. This Report concludes that many of the questions asked about health status could form the basis of routine health audits. When combined with socio-economic data (for example, by using the clustering analysis described earlier), important relationships between population characteristics, morbidity patterns and service use can be explored. With hindsight,

the authors feel that the questionnaire issued to patients should have included more questions relating to lifestyle and social characteristics (possibly at the expense of patient illness experience or primary care contacts).

Finally, it is worth stating that whilst there are limitations on the extent to which primary care databases can help define needs, there may be value in examining variation in practice (or individual GP) referral patterns. District and Regional Health Authorities are responsible for monitoring contractual arrangements. The referral patterns of GPs (whether fund-holding or not) will have a significant bearing on the extent to which contracts are adhered.

## 2.5 ACCESS STUDY

Access studies have been undertaken in all participating districts to determine the relative ease of accessibility of populations served to major hospitals.

This Section of the Final Report has:-

- Outlined the importance of access factors as they relate to health care needs and uptake of services.
- Examined the relevance of access issues to purchasers and providers of services.
- Suggested ways in which access information can be combined with socio-demographic, utilisation data, etc, so that demand patterns can be analysed.

These studies have provided health authorities with new information which can be used to explain existing patterns of service use as well as identifying areas where problems might arise.

### *\* The Importance of Accessibility*

Access to services has two dimensions, namely social and geographical. Social access relates to the knowledge required by individuals to obtain services. This will relate not only to whether services are sensitive to the needs of different groups (eg. ethnic minorities, one-parent families) but also to any social barriers to using a service (eg. do the middle and upper classes know how to use health care systems more effectively?) These issues are mainly addressed in Section 2.4.

The main concern of this Section is geographical access. This relates to the ease with which people in different localities can travel to health service facilities. Ease of access has been expressed in terms of distance and travel time, but could (with further work) be expressed in financial terms, if this were felt to

be useful.

Accessibility to health care facilities is important for patients, visitors, informal carers and a variety of staff groups (although this last group was not explicitly considered in this project). Health services are provided from a variety of locations ranging from GP surgeries to large District General Hospitals. For purely practical reasons it was decided to focus attention in this study on accessibility to large District General Hospitals, although it is acknowledged that access to GP surgeries, community hospitals and outpatient clinics also plays an important role in explaining uptake of services.

The Report also recognises that travel times and distances are not the only dimensions of accessibility which are important. When examining the significance of access-related issues it is important to recognise that both the frequency of service use and the urgency of clinical need are important considerations.

#### *\* Access and Quality*

When considering what constitutes high quality health care provision it is important to recognise that accessibility is only one aspect. Appropriateness, timeliness and effectiveness of service also need to be considered. The Report indicates that under certain circumstances it might be necessary to trade off accessibility of service against provision of a more appropriate or effective form of treatment. Accessibility to more distant services may also have to be improved if local waiting lists are to be reduced.

#### *\* Methodology*

Factors which influence accessibility to main hospitals include: road networks, public transport routes, and the type of transport used to get to hospitals. The methodology used in this study addressed the first two of these factors by analysing likely travel

times by private and public transport.

### Private Transport

It was agreed to analyse time bands in five minute intervals. Staff at the Consortium used the Department of Transport "Regional Highway Traffic Model" to calculate likely travel times to and from main hospitals. By linking together a series of points which are equidistant (timewise) from the hospital, an isochrone can be drawn on a map. These isochrone maps can then be superimposed on electoral ward maps, and related to OPCS population estimates and other Census data.

In some cases, isochrones were established for hospitals outwith the district of study. This enabled areas to be identified which are broadly equidistant between hospitals. The NHS and Community Care Act suggests that "money should follow the patient" and it is conceivable that these geographical areas might attract competition between provider units for patients. One possible method of competition may be to improve accessibility by offering travel subsidies.

### Public Travel

A similar approach to that outlined above was used to assess public transport times. It was necessary to identify a central population point in an electoral ward and to calculate the time it would take to travel from that point to the identified hospital. In highly populated wards, two or three population points were selected.

Bus route information (including journey times) was utilised to establish isochrones in much the same way as for private transport. Waiting times and walking times were also accounted for within the approach. It was no surprise to find that travel times by public transport were far greater than by private transport especially in rural areas.

It was a much more onerous task to calculate travel times by public transport than by private transport - largely because of the difficulties in obtaining accurate information. It should also be noted that public transport networks change far more regularly than private transport networks.

*\* Main Objectives of Further Work*

Access study results could be combined with data generated in different Sections of the Final Report in order to establish the local relationships between access factors and hospital service use. This was done in the case of material generated in the outpatient survey and the results, although tentative, do suggest that the further away people are from a main hospital, the less likely they are to be outpatients, even when socio-demographic characteristics are taken into account. Knowing the strength of this relationship in a particular locality or specialty may be very important.

The studies undertaken in this Section can be used to identify areas which appear to suffer from poor accessibility. If this information is reinforced by a low uptake of services by people from that area, then management might consider ways of addressing the problems, for example by improving transport to and from hospital or by operating out-based clinic sessions. Equally, poor uptake not explained by access may be of interest.

Finally, both purchasers and providers will be interested in the nature and extent of inflows and outflows of patients from within District Health Authority boundaries. Inflows and outflows may occur for a variety of reasons - but issues of accessibility will invariably play a part.

*\* Conclusion*

District-specific access studies have been supplied to participating DHAs for them to use in the future planning of services. The



information is new and, in the case of private transport studies, will not need frequent updating.

In the case of public transport studies, however, it is suspected that travel times will change with variation in bus routes - which in some instances is a frequent occurrence.

Further areas of work have been identified as part of this study and there is clearly scope for access studies to be more widely used than in recent years.

## 2.6 OUTPATIENT SURVEY

### *\* Purpose of the Section*

This Section aimed to assess the value and role of information about outpatient activity. It was decided to undertake a survey of outpatients in each of the participating DHAs. The objectives of this survey were to explore the practical problems of collecting and analysing outpatient data and to illustrate the uses to which they might be put. Survey work was undertaken over a sample period of one month.

### *\* Role of Information About Outpatient Activity*

It is clear that a minimum data set for outpatient activity will be required by provider units in order to negotiate contracts and establish billing arrangements. It is also clear that the purchaser will need access to this information and, furthermore, is likely to want additional information relating to how well outpatient services can meet the quantitative and qualitative needs of the population.

Outpatient information has traditionally been very scarce and of poor quality, largely because of the onerous investment required to monitor such large volumes of activity. Before investing in any information systems designed to reflect outpatient activity, the purchaser should consider the following questions:-

What are the key determinants of existing demand patterns for outpatient services?

Do current demand patterns reflect the levels of need to be expected from the population?

What are the resource implications associated with current demand patterns and those based on needs assessment?

How effectively can different outpatient services meet the needs of resident populations?

How best can resources be deployed to ensure that outpatient services meet the needs of a population?

It is unlikely that any information system could fully answer all of these questions. Nevertheless, the outpatient survey undertaken as part of this study has demonstrated how some less ambitious, yet relevant, questions might be answered by implementing new information systems. A summary of the practical problems of collecting and analysing the outpatient data is also provided.

*\* Data Requirements*

The minimum data requirements for invoicing and contract placement are:

- name and address of patient (with postcode).
- name and address of GP (or other person making the referral).
- specialty attended.
- date of the clinic.
- attendance or non-attendance at appointment.

Additional data suggested for planning and epidemiological purposes are:

- location of clinic.
- age or date of birth of patient.
- sex of patient.

The collection of such data should be part of an outpatient Patient Administration System (P.A.S.). Almost all the data needed to run the system are already held in medical records. It has been estimated that between 0.1 wte and 1.0 wte clerical staffing

resource would be required to input the data on an outpatient P.A.S. This will, however, largely depend upon how advanced local systems are at present.

The onus will usually be upon provider units to maintain and administer local information systems. Purchasing agencies should acknowledge that any additional information systems required for contract monitoring will have financial implications. It is the responsibility of purchasers and providers alike to determine the extent and nature of information on outpatient activity to incorporate within contracts.

In an ideal world, a purchaser should have the facility to generate a resident based data set for outpatients which will enable analysis of patient flows both within and between DHA boundaries. The purchaser should consider information requirements carefully before entering into specific contracts with providers.

*\* The Outpatient Survey*

The survey work undertaken as part of this project provides an illustration of the types of analyses which could be undertaken on data generated from an outpatient P.A.S. The actual data available in the outpatient survey should be treated with utmost caution largely because of problems of "small numbers" generated via the sampling frame. Taking this further, outpatient data may be linked to other data to allow assessment of their particular role in unusually high or low take-up rates of inpatient services.

Numerous analyses of the data sets were undertaken and each one has potential to inform the contracting process. Generally speaking, it is important to understand current patterns of the demand for services before plans for improvements in service can be initiated. The following analyses will be of direct relevance to improving knowledge of current demand patterns:

### Assessment of Uptake

- No. of outpatient appointments by age.
- No. of outpatient appointments by sex.
- No. of outpatient appointments by residence, by specialty.
- No. of outpatient referrals by specialty.
- Age profile of specialty - specific outpatient referrals.

Information relating to referral sources will be of potential use when assessing how changes in outpatient activity might be initiated. Much of this information will be GP or Practice based, namely:

### Assessment of Referral

- Referral rate by GP.
- Referral rate by Practice.
- GP referrals by specialty.

These analyses will be particularly useful if the purchaser is trying to identify GPs who appear to be "high" or "low" users of local services. There are no hard and fast rules as to whether a particular level of service use is a "good thing" or not, but purchasers may want to enter into individual discussions with GPs if they feel that, for example, the number of referrals reflects "over-use" of a particular service or that a low referral rate to a local service is associated with patients being referred to a "non-preferred" provider.

For planning purposes, a purchasing authority will be interested in identifying potential areas of unmet need. Invariably, this will involve cross-analysis of outpatient activity, socio-demographic and epidemiological information. Some analyses undertaken in the outpatient survey might prove useful here (though many others could be undertaken).

### Assessment of Unmet Needs

- Referral rates by electoral ward.
- Referral rates by travelling time.

All of the above analyses are of potential use in the contracting process but they are by no means a comprehensive list of all possible analyses.

#### *\* Conclusion*

The outpatient survey work has demonstrated some potential uses of information and has also highlighted practical problems and costs associated with information retrieval. The advent of computerised information systems should improve both the quantity and quality of raw data. Outpatient information can be utilised in the planning of service provision as well as establishment of contracts between purchasers and providers.

## 2.7 HEALTH SERVICE INDICATORS (HSIs)

### *\* Purpose of the Section*

This Section aimed to assess the usefulness of "health indicators" in helping to define local needs and the extent to which these can be met efficiently. Health Service Indicators cover a wide range of hospital based activities and concentrate upon a limited group of specialties. It was decided to concentrate upon a group of seven indicators from a set recommended by the HSI Group in "A report on Körner Indicators" published by the Department of Health in December 1988. The data analysed in the report relate to the financial year 1987/88.

The Section also attempts to distinguish between those indicators that are likely to be of most importance to a purchaser of health care, and those which are of more relevance to a provider. Much of the Section contains information relevant to specific districts, notably where comparisons are made with national and regional performance.

### *\* Known Limitations of Health Service Indicators*

When first conceived, Performance Indicators were acknowledged to have considerable limitations. They were developed as a tool to be used by health service managers and clinicians to improve the way in which health services could be provided to local populations. They were never intended to be used as "measures" of efficiency or productivity, but rather as "indicators" of where performance might be improved through dialogue with service providers. This being said, it is fair to say that Health Service Indicators are likely to have been used as crude measures of efficiency by managers faced with having to make difficult budgetary decisions and with only very limited alternative sources of "performance" information.

The validity, accuracy and timeliness of HSIs should always be

questioned. As most indicators relate to broad specialties, it is often difficult to account for case-mix variations which exist within specialties. For example, the specialty of Orthopaedics in one district might be dominated by elderly patients which in another district may be treated on Geriatric or Rheumatology wards. The presence of high proportions of elderly patients within a specialty will, invariably, tend to raise average lengths of stay and reduce throughput when compared to the same specialty in another District.

Raw data used to calculate HSIs may prove different to the data sources held locally. This often occurs when Regional Health Authorities use "bottom line counts" to gross up figures for their Districts. The way in which such indicators are presented also has potential to be problematic. HSIs are usually expressed as percentile ranks alongside absolute values. Great care should be taken when looking at percentile values in isolation - especially when there are significant amounts of "missing information" nationally or within a region. Percentile values should also be viewed in relation to mean values and standard deviations.

Another cautionary note on HSIs is that they should not be examined in isolation as they are often inextricably linked with one another. For example, all other things being equal, a high length of stay will lead to a low throughput - or a high proportion of day cases might accompany a high average length of stay for other inpatient cases.

The timeliness of HSIs has frequently been challenged. This criticism, however, can perhaps be made of all historic information, not just HSIs. It is nevertheless questionable whether HSIs can be used to predict future performance.

In spite of all of these shortcomings, it is still the case that, from a management perspective, a world with Health Service Indicators is certainly better than one without comparative information on health service activity.



*\* Towards Purchaser and Provider Indicators*

The recent NHS and Community Care Act distinguishes between a "purchaser" of health services, who plans for the demand of a resident population (in most cases a District Health Authority), and a "provider" of health care services to individuals who might originate from one or more resident populations, that is a catchment population.

Given this distinction, it would seem appropriate to devise a set of HSIs which offers the purchaser comparative information pertaining to demands made from resident populations. It would also be appropriate to offer providers comparative information on the way in which services are supplied to catchment populations.

In practice, this distinction perhaps over-simplifies the interests of purchasers and providers, in that all parties could find a use for supply and demand information. For example, information about length of stay in a particular hospital will be of interest to both purchasers and providers. In presentation terms, however, it might be appropriate to devise a hierarchy of indicators (as was done in earlier versions of HSIs) with purchasers and providers having different primary and secondary sets of indicators.

*\* District Specific Analyses*

Information pertaining to each of the ten participating DHAs was analysed in relation to the national position and relevant Regional picture. Seven indicators were selected for analysis in order to give a broad picture of each district from both purchaser and provider perspectives.

The indicators chosen were:-

- Length of stay
- Throughput
- Percentage of day case activity
- Hospitalisation Rates
- Percentage of outpatient referral attendances
- Percentage of patients on a waiting list
- Treatment Intensity Rates

District Health Authorities will have access to these indicators locally and the analyses provided in the Final Report are intended to supplement districts' own analyses.

*\* Conclusion*

One important limitation of Health Service Indicators is their inability to adequately address the economist's notion of "efficiency", which concerns the relationship between inputs and outputs. It is well known that little information exists about health outcomes and hence little can be said about true efficiency. Clinical audit does offer some scope for information on health outcomes - but this was area was not within the project remit.

This Report suggests that health service indicators are limited in the extent to which they can inform purchasers and providers about the local need for health services. The indicators, however, could be used as a first line of enquiry (in much the same way as they were initially designed) which would enable both purchasers and providers to ask questions about whether process performance could be improved.

The Report has proposed that indicators be re-structured to reflect the responsibilities of purchasers and providers following the NHS and Community Care Act. It is also likely that, as new information systems are implemented in the NHS, more sophisticated indicators

might be developed. It is hoped in particular that these will relate increasingly to aspects of quality of service delivery.

## ANALYSIS OF HOSPITAL ACTIVITY DATA

There were two main aims in carrying out analysis of the hospital activity data. Firstly, there was a need to define what was currently carried out within the DHA. That is, what services were currently provided and what types of patient were currently receiving treatment. This clearly involved analysing the workload of hospitals within the DHA and was a provider-based analysis. It did, however, present information both on district residents treated within the DHA boundary and on patient inflows from other districts. In addition, the hospital-based data were useful when considering other data sources such as the health service indicators and patient accessibility work.

Secondly, there was a need to analyse what services were currently used by DHA residents. This involved analysing the resident based dataset, that is, activity information on all DHA residents regardless of where they were treated. In the first round of contracting, it is inevitable that NHS contracts will closely follow current patterns of service utilisation by DHA residents. Hence, mapping where those residents are currently treated must be seen as an information priority.

Section 9 of the Final Report, which contains analysis of the hospital activity data, is structured as follows:

- Section 9.1 - Aims and Objectives
- Section 9.2 - Data Source
- Section 9.3 - Description of Variables
- Section 9.4 - Method of Analysis
- Section 9.5 - Analysis of Hospital Based Data Set (HBDS)
- Section 9.6 - Analysis of Resident Based Data Set (RBDS)
- Section 9.7 - Analysis of ICD78 Groupings
- Section 9.8 - Major Causes of Years of Life Lost (RBDS)
- Section 9.9 - Admission Rates (RBDS)
- Section 9.10 - Summary

Note that, for Trent RHA districts only, Section 9.10 contains a brief analysis of diagnostic-related groups (DRGs), and Section 9.11

is the Summary.

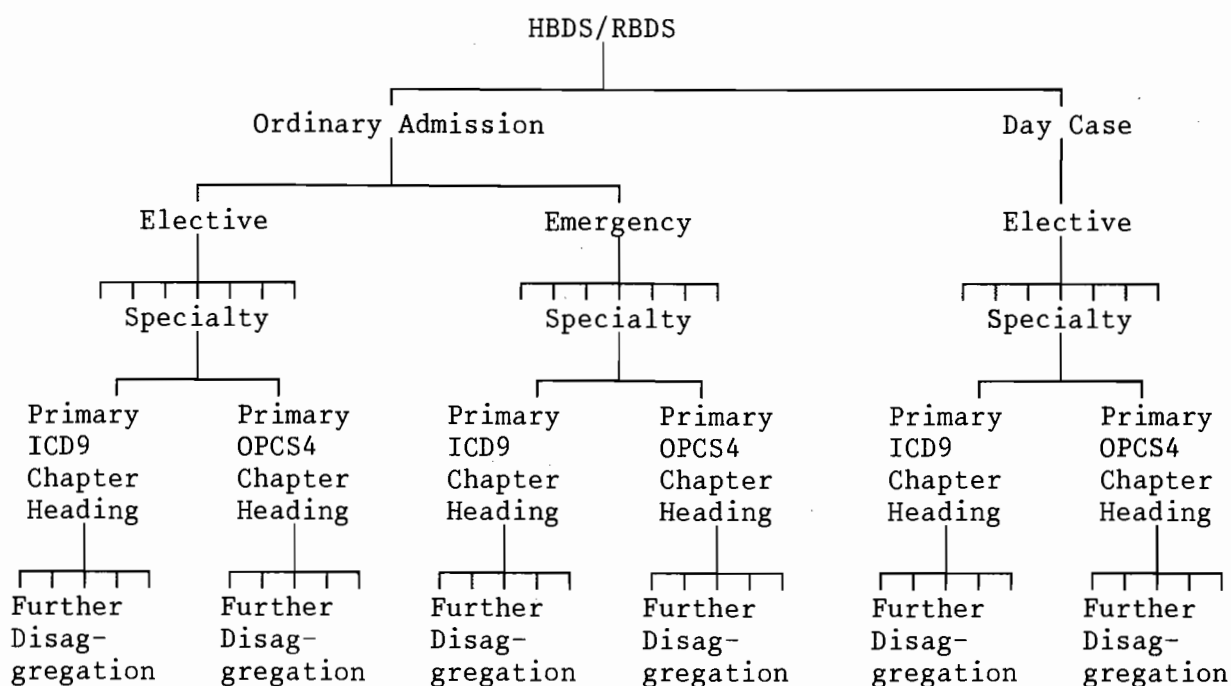
The Körner activity tapes were obtained from each Regional Health Authority for the financial year 1988/89. For each participating DHA, two data sets were constructed to mirror the aims and objectives defined above: namely, the hospital and resident based data sets. The former (to be referred to as the hospital based data sets, or HBDS) therefore contained data on all patients treated within the DHA boundary, while the latter (to be referred to as the resident based dataset, or RBDS) contained data on DHA residents, regardless of where they were treated.

Two issues are considered to be of crucial importance in discussing analysis of the hospital activity data. These are, firstly, the classification of activity, and secondly, the issue of cross-boundary flows.

*\* Classification of Activity*

The key question to be addressed within the hospital activity analysis was how to classify the data in the most meaningful way. A number of classifications is possible, depending on the degree of disaggregation carried out on the data. A "top down" approach was adopted to avoid getting into too much detail too quickly, hence avoiding the problem of small numbers within different categories of activity. The Figure below is useful in illustrating the possible levels of disaggregation:

## CLASSIFICATION OF HOSPITAL ACTIVITY DATA



Analysis of the HBDS and RBDS was carried out broadly in line with the above. The most general level of analysis was by elective/emergency admission and ordinary admission/day case, followed with analysis by specialty. The next main level of disaggregation was by ICD9 and OPCS4 chapter heading.

It was decided that attempts should be made to further disaggregate the ICD9 codes. Further disaggregation of the OPCS4 codes would be useful, and indeed essential, when examining particular areas, but of course not all patients have an operation or procedure. On the other hand, all patients should have a diagnosis and hence in theory be accounted for by an ICD9 code.

Although they are a useful starting point, the ICD9 chapters in themselves are too broad to present a detailed breakdown of activity. Conversely, there are too many individual ICD9 codes for practical analysis. A compromise was sought with the objective that a list of ICD9 groupings should be able to account for approximately

70-80% of activity within specialties. The chosen level of 70-80% has no particular significance, but simply represents an arbitrary figure which constitutes a clear majority of cases.

The ICD9 manual suggests "mortality and morbidity lists" which, when combined, provide a reasonably comprehensive list of ICD9 groupings. All of the inpatient activity data were analysed according to this list, but unfortunately accounted on average for a relatively low percentage of activity within specialties (there was, not surprisingly, great variation across specialties, but results were disappointing even for the "major" specialties such as General Surgery).

It was decided, therefore, to supplement the list using ICD9 groupings which have been employed elsewhere. These additional groupings were more specialty-specific, having been used in other Consortium studies to account for activity within particular specialties. The challenge encountered in this study, however, was to find a universal (ie. across all specialties) ICD9 listing which accounted for the majority of activity. Success here varied by district and by specialty. The final ICD9 listing used contained 78 groupings in total. This list of ICD groupings (ICD78) is far more detailed than main chapter headings, and hence more meaningful in terms of contractual implications.

It is important to note that this ICD classification has been used to account for the majority of activity within specialties. Other classification systems are more comprehensive - such as the Read Classification and Diagnostic Related Groups (DRGs) - but they have not been universally accepted as definitive classification systems. DRGs in particular are still somewhat unusable because of the large number of individual categories; also, they are perhaps more useful as a billing mechanism and as such suffer from well-known problems of "DRG creep". The ICD78 classification used here had the advantage of being relatively easy to manage and yet was reasonably comprehensive in its coverage.

For the purposes of contracting, this issue of classification will be viewed differently by purchasers and providers. The current supply-driven system lends itself to activity being described in terms of specialties. Contracts specified by specialty are useful to providers whose clinicians are familiar with such divisions. From the perspective of purchasers, charged with assessing health needs, such classifications will simply perpetuate the dominance of supply factors. People do not present to the health care system with General Medicine and Rheumatology - they present with symptoms and diseases. A diabetic may cut across several specialties during a particular episode of care. It is this mis-match between purchasers' and providers' perspectives which makes the issue of classification so important for contracts. There are considerable complexities in ensuring that all of the possible conditions with which people present to the health care system map across to provider specialties. For all participating districts, a breakdown of specialties by ICD78 is provided as a starting point in this mapping process, for both the HBDS and RBDS.

*\* Cross-Boundary Flows*

An overall comparison of each district's HBDS and RBDS will reveal whether that district is a net importer or exporter of cases. A large teaching district, for example, would be expected to be a net importer of cases, treating more patients in its hospitals than the workload generated from its resident population. Districts will wish to examine inflows and outflows at a much more detailed level. When drawing up contracts for services, they will have to consider where different groups of patients will receive the most cost-effective care. In many cases this will be from hospitals in different districts, for example because the expertise is not available locally, or because there is insufficient capacity locally. Analysis of existing flows by case-mix was therefore performed on the participating districts' HBDS and RBDS. Comparisons were made between the HBDS and RBDS within a district, and also between hospital/resident based data sets across districts.



The overwhelming reason for any difference in utilisation patterns was explained by supply factors. For example, the presence of an ENT service in one district appeared to mean that the residents of that district were more likely to be hospitalised for (eg.) chronic disease of the tonsils and adenoids. What is not known, of course, is whether such a higher utilisation of hospital services reflects higher levels of "need". The need to make links between analysis of utilisation rates and other information sources is manifest: for example, are high ENT hospitalisation rates mirrored by high outpatient attendance rates in that specialty? Are waiting lists for ENT reflecting a comparatively high level of unmet expressed need? Do GP morbidity surveys indicate that the district has a particular problem in this area? Much of the analysis of hospital activity data, contained in Section 9 of the Final Report, is illustrative. By comparing data sets within and across districts, it starts to highlight areas where further analysis is warranted.

Clearly, where a district's residents are treated will have considerable cost consequences. One of the features which will have a significant impact on cost is length of stay. Analysis was carried out on the resident based data sets to produce length of stay figures by DHA of treatment. This was undertaken at specialty level for ease of exposition, but could in principle be carried out for any ICD9 or OPCS4 codes (or DRGs in Trent). Many significant differences in median length of stay by specialty were found, prompting further investigation of case-mix.

It is of considerable interest to purchasers to identify, for example, a length of stay for its residents in a neighbouring DHA which is two days longer than for residents treated in its own hospital(s). The difference may be explained by case-mix, but at least the question has been asked. A further explanation may simply be that the specialty concerned - for example, General Medicine - comprises a number of sub-specialties. Again this will have a significant impact on costs: for example, whether a patient is coded under Cardiology or General Medicine will have a profound

influence on contracts which are negotiated in terms of average specialty costs.

3.

### LINKS BETWEEN SECTIONS

In terms of Figure 1, outlined at the end of the Introduction, Phase I has focused largely upon the top half of the diagram, examining issues related to population characteristics and classification of disease. It has also, however, concentrated on information requirements for specifying and monitoring contracts. Phase II of the project is intended to start the process of adding information on costs and effectiveness, which will in time allow informed priority choices to be made in purchasing health care services.

This Section is intended to explore briefly the links between the various subject areas covered in Phase I, and to indicate where each area fits into the overall framework. Rather than covering each area in detail, this is attempted by raising a number of questions which will be of interest to DHAs in their role as health needs assessors and purchasers of services to meet those needs. It is hoped that the "prompts" given below each question will illustrate that all of the issues covered in Phase I are inter-linked and must be viewed as integral parts of a continual process of needs assessment, priorities and contract-setting/monitoring.

*\* What is known about the district's resident population?*

- examine age, sex, socio-economic composition, changes in population trends over time (eg. fertility rates);
- how can deprivation be measured and how does it vary within the district?
- do areas with higher levels of deprivation demand less health care services at primary and secondary tiers of provision?
- what relationship does there appear to be between deprivation and health status in particular areas?

- to what extent can health care services ameliorate particular problems?
- where are the boundaries of care between the Health Authority and Local Authorities/Social Services?

*\* What is known about mortality and morbidity within the district?*

- examination of Public Health data on death rates (overall and by cause), "avoidable deaths" and years of life lost;
- how does the district compare with others in the Region and nationally?
- where are the "black spots" within the district for major causes of death or years of life lost?
- what is the morbidity pattern of people presenting to General Practice, in terms of both symptoms and diagnoses?
- is this pattern typical of morbidity in the population as a whole (could look at district in isolation or national data sets for similar populations in age/sex terms)?
- is the pattern of morbidity at primary care level mirrored by activity at outpatient clinics and in hospital stays?

*\* How can current utilisation be classified?*

- need to take a broad view of the disease process and of health care services; the latter may be preventive, therapeutic, rehabilitative and caring; need to recognise symptoms, diagnosed conditions, operative procedures, client groups, historical organisation of activity;

- how do symptoms and diagnoses map into what health care services can be purchased (crudely, how do diseases map into specialties in initial rounds of contracting)?
- what is the case-mix composition of particular specialties (could examine ICD9, OPCS4 and DRG classifications within specialties)?
- how does case-mix in this district vary with other districts (could examine districts with similar age/sex/socio-economic composition)?
- what measure of case-mix should be used to monitor contracts in a more sophisticated way over time?

*\* Where do residents of this district currently receive services?*

- need to examine wide range of activity statistics and referral patterns;
- how does uptake of services vary within the district boundary (screening services, outpatient attendance rates, hospitalisation rates, etc.)?
- should residents who are currently receiving hospital services outside the district boundary continue to do so?
- to what extent is it possible or desirable to influence current referral patterns?

*\* What affects current utilisation?*

- need to have detailed analysis of activity by, for example, inpatient or day case or outpatient, elective or emergency, ICD9/OPCS4/specialty, GP referral patterns, etc;

- to what extent is current utilisation affected by supply factors?
- why is there a large variation in utilisation rates within the district boundary (by electoral ward or whatever)?
- what other factors might influence utilisation of services (socio-economic characteristics and patient accessibility, for example)?
- what can/should be done to change rates of service uptake (eg. transport facilities for residents in rural areas of district)?
- what information exists to relate factors such as accessibility and car ownership?
- is there any relationship between, for example, outpatient attendance rates and proximity to the service?
- to what extent are "base" data on mortality/major causes of death mirrored by utilisation patterns?

*\* How does this district compare with others in terms of key indicators?*

- need to examine comparative data sets such as Public Health Common Data Set and Health Service Indicators, perhaps identifying broadly similar districts within the Region and nationally for comparison;
- recognise the need to undertake comparative analysis within the district, at (for example) electoral ward level;
- to what extent can waiting list data proxy unmet need and how does the district compare by diagnosis/procedure/specialty?

- how do hospitalisation rates compare and are high/low rates mirrored by presenting morbidity at General Practice level?
- should day case rates for particular procedures be increased?
- why does length of consultant episode for particular diagnoses/procedures/specialties vary so much by DHA of treatment?
- what implications do these features have for contract-setting and monitoring?

At least two fundamental issues arise from this long - but not by any means exhaustive - list of questions. Firstly, there is a great need for useful, accurate and timely information if any of these questions can be successfully answered. Phase I of this project has tackled the issue of which information sources should be examined in commencing the process of health needs assessment. It has asked the question "how useful are those existing information sources?" and used illustrative analysis where applicable to demonstrate what could be done if data quality was not a problem.

Allied to this is the issue of what supplementary information is needed locally to answer some of the above questions. There is no doubt in the authors' minds that a vast amount can and should be learnt from the analysis of existing information sources. The trick is in knowing which questions to ask, and it is hoped that this Section has highlighted some areas where further analysis within districts is warranted. It is worth emphasising two final points on this subject: firstly, the well-worn but often-neglected distinction between data and information; and secondly, information needs should lead IT investment, and not the other way around.

The second issue arising from the above list of questions relates to the fundamental economic problems of scarcity and choice. Several of the questions are concerned with what should be done as opposed

to what currently is done. Given scarce resources, all purchasers will of course have to compromise when attempting to match what should be done for their residents with what can be done. In the process, however, there should be a profound shift in emphasis from the current supply-driven system to a need/demand-led system. Consequently, purchasing decisions will necessarily involve making choices as to which identified health needs should or should not be met. Again the constraint is that of information availability - only this time, the information required is about costs and effectiveness. The production of such information is the primary concern of Phase II, and should be regarded as the main focus of any research into the future role of purchasers of health care services.