people ignore medical advice, and although the harm may not be apparent for many years, their subsequent health care is more expensive.

We offered the patient the same commitment we offer smokers, heavy drinkers, those who don't take regular exercise, and all of us who at some time have ignored medical advice. A patient's decision to accept treatment or not must be viewed in the wider context of rationing health care. It is for society to decide what proportion of its resources should be spent on health care and, within that limit, on what it should be spent. Until then patients must be free to refuse treatments they find unacceptable without fear of being denied care.

Equity in the NHS

Monitoring and promoting equity in primary and secondary care

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Although need is often assumed to be the most important factor in determining the use of health services, there are many inequities in the provision and use of NHS services in both primary and secondary care. For example, existing data from district child health information services have been combined with census data for small areas to show wide variations in immunisation rates between affluent and deprived areas. Purchasers of health care are already responsible for assessing health needs and evaluating services, and the process of monitoring equity is a logical extension of these activities. Routine data sources used to collect activity data in both primary and secondary care can be used to assess needs for care and monitor how well these needs are met. Purchasers and providers should collaborate to improve the usefulness of these routine data and to develop a framework for monitoring and promoting equity more systematically.

Despite access to health care on the basis of clinical need always having been a central tenet of the NHS,[1] there are still many inequities in the provision and use of health services in Britain. These inequities are partly a result of the variable provision of services inherited by the NHS at its inception in 1948. As the first two papers in this series have shown,[2,3] the NHS has made considerable progress in reducing these inequities. Nevertheless, policies aimed at redistributing services more fairly have often not considered how this can be achieved in practice, and inequities still persist in both primary and secondary care.

In primary care there are large variations in the use of general practitioner services. Young children, elderly people, residents of socially deprived areas, and members of ethnic minorities have a greater need for care and have higher than average consultation rates.[4-6] However, deprived areas that might be expected to have a greater need for care often have lower quality general practitioner services than more affluent areas.[7,8] Moreover, uptake rates of preventive services such as childhood immunisation[9,10] and cervical cytology screening[10,11] are often low in these areas.

Research in the United States and other countries has consistently shown that poor people, elderly people, women, and those from ethnic minorities have poorer access to hospital services than more privileged groups.[12-16] Specific inequalities have been shown for cardiology services,[17] maternity care,[18] renal transplantation,[19] asthma,[20] and cancer treatment.[21] There is now evidence, most of which has come from studies using routine hospital activity data, that less privileged groups also have poorer access to hospital services in the United Kingdom.

Since 1991 purchasers of health care have been responsible for assessing health needs and evaluating services.[22] Although the process of monitoring equity in the provision and use of health services should be a logical extension of these activities, many purchasers, driven by the financial imperatives of contracting, have confined monitoring to measuring activity levels, lengths of stay, and costs. Moreover, routine NHS information systems have been mainly developed for management and administrative purposes and not to help with measuring health status, access to health services, or the outcomes of health care. In this paper we review previous work measuring equity in primary and secondary care within the NHS and show how purchasers can develop methods to monitor equity in the use of health services for their residents, using routinely available data sources.

Promoting equity in primary care

Data sources available to purchasers about general practitioner services include the call-recall systems for cervical cytology screening and childhood immunisation; claims data—for example, for night visit fees; prescribing data; referrals data (from both the annual reports of general practitioners and hospital information systems); and data on services offered—for example, health promotion services, minor surgery, child health surveillance. These data can be analysed on either a geographical or practice basis to monitor how health services are provided and used.

GEOGRAPHICAL ANALYSIS

Child health is an important part of primary care and can be used to illustrate how purchasers can use data from primary care to monitor inequities. District child health information systems provide a large amount of data, allowing the use of services to be compared with the need for health care and the social characteristics of populations. For example, studies linking postcoded health data to census data covering small areas have revealed wide variations between affluent and deprived areas in perinatal, infant, and childhood mortality[23,24]; prevalence of low birth weight[24,25]; mean height of schoolchildren[9]; rates of accidental injury[26]; and respiratory illness.[27] The importance of monitoring such variations is that localities that may benefit from additional resources can be identified and the effectiveness of medical and social interventions aimed at reducing inequalities evaluated.

One study that did this examined variations in immunisation rates between deprived and affluent areas in Northumberland.[28,29] Immunisation against pertussis was lowest in the most deprived enumeration districts (fig 1). When the enumeration districts were categorised as urban or rural, however, there was no social gradient in rural areas, while there was still a

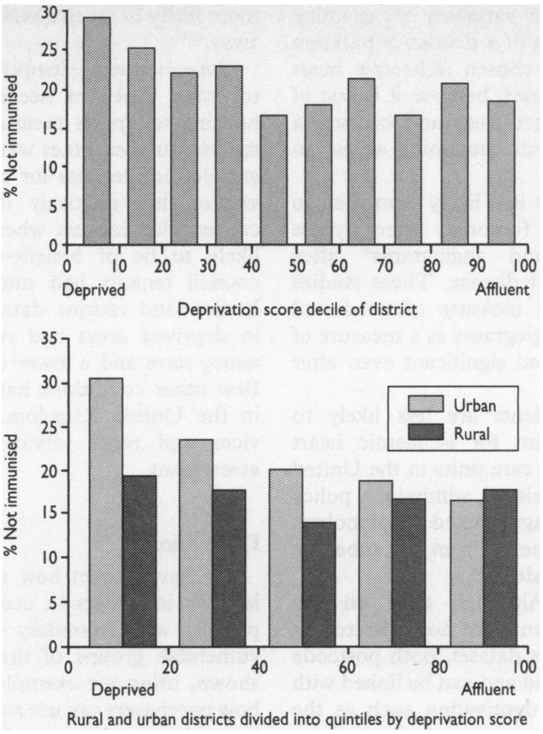

FIG 1—*Percentages of 15 month old children not immunised against pertussis by Townsend deprivation score of enumeration district of residence*

steep gradient in urban areas (fig 1), illustrating that inequities may vary between localities.[28] Social variations in immunisation rates were monitored before and after an intervention to improve uptake in which primary health care teams were given the names of children who had not been immunised.[29] Although immunisation rates increased dramatically, inequities in uptake between deprived and affluent areas did not start to decrease until rates in the affluent areas approached a ceiling of 95%.

Many of the more successful attempts at improving equity in child health have originated from within single primary health care teams. Examples include increasing the uptake of preventive services[30] and improving the diet of children[31] in deprived areas. In another initiative in Glasgow census data, mortality statistics from the Office of Population Censuses and Surveys, child health data, and hospital activity data were analysed by postcode sector and the results fed back to primary health care workers and health planners to help them plan community and primary care services.[32] The advantage of intervening at general practice level is that solutions to problems can often be found more easily, especially when backed by detailed local knowledge and research.[33]

PRACTICE ANALYSIS

The Southampton and South West Hampshire Health Commission has recently shown how routine data can be used to produce comparative indicators of the performance of general practices.[34] For example, in practices in the commission's area night visiting rates varied from 1·5 per 1000 patients to 32·9 per 1000 patients, cervical smear uptake rates from 56% to 96%, and the number of patients per general practitioner from 1080 to 2816. Family health services authorities need to combine such data with information on the social, ethnic, and demographic characteristics of individual practices when planning services and targeting resources.

General practitioners who work in "deprived" areas receive deprivation payments based on Jarman scores for electoral wards,[35] but there is no obligation on them to use these payments to improve the services they deliver. Moreover, the assumption that the percentage of a practice population eligible for deprivation payments can be used as a comparative measure of the need for care is flawed. Payments are still made on the basis of 1981 census data even though the results of the 1991 census are now available; and the validity of using Jarman scores to identify areas with high levels of deprivation has been questioned.[36-38]

Purchasers therefore need better measures at a general practice level of the need for care. Because of advances in information technology and the recent availability of data from the 1991 census it is now possible to link postcoded data in family health services authority age-sex registers with small area census data to produce a range of social and demographic variables for each general practice in a family health services authority.[39] These variables offer a potentially more flexible method of measuring the need for primary care than current methods. In Merton, Sutton, and Wandsworth when these variables were compared with variations in the provision and use of services they were found to be much better at explaining these variations than the percentage of the practice population eligible for deprivation payments.[39] For example, cervical smear uptake rates among practices were negatively correlated with variables associated with social deprivation such as car ownership (fig 2). There was, however, no association between uptake rates and the percentage of the practice population eligible for deprivation payments.

Promoting equity in secondary care

The most important routine data source in secondary care is the minimum contract dataset,[40] which is collected for every consultant episode and forms the basis of purchasers' analyses of hospital activity. The minimum dataset can be used to calculate admission and treatment rates by age and sex. Because it also includes the patient's electoral ward and postcode, these rates can be related to social data from the 1991 census and to small area mortality data.

Access to services for the treatment of ischaemic heart disease can be used to build a framework for assessing equity in secondary care. For example, figure 3 shows how people with ischaemic heart disease progress through some of the main service delivery points for this disease. It also shows how proxy measures of need, access, and outcomes at each of these delivery points can be developed from routine data and

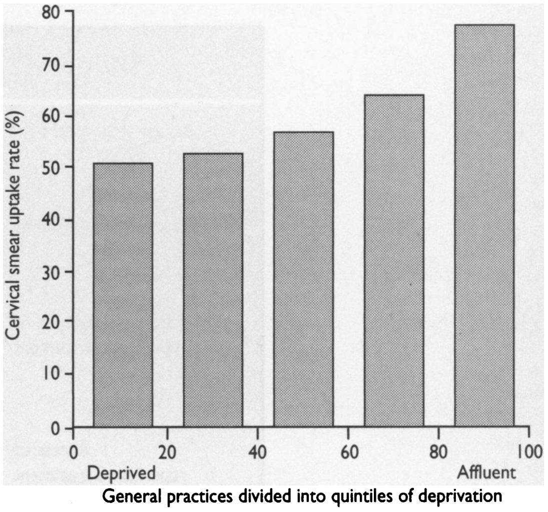

FIG 2—*Mean cervical smear uptake rates achieved by the general practices in Merton, Sutton, and Wandsworth Family Health Services Authority after dividing them into quintiles of deprivation (based on the estimated percentage of the practice population living in households without a car)*

used with sociodemographic variables to examine issues of equity for subgroups of a district population (described below). We have chosen ischaemic heart disease to illustrate this approach because it is one of the *Health of the Nation* target areas and because a substantial amount of research examining access to services has taken place.

Sex differences—Women are less likely than men to receive reperfusion treatment (coronary artery bypass grafts or angioplasty)[41 42] and angiograms[43] after admission for ischaemic heart disease. These studies used admissions as a proxy measure of need and reperfusion treatment and angiograms as a measure of provision; differences remained significant even after adjusting for comorbidities.

Age differences—Older patients are less likely to undergo reperfusion treatment for ischaemic heart disease. One fifth of coronary care units in the United Kingdom operated an age related admissions policy and two fifths operated an age related thrombolysis policy,[45] even though the benefits from thrombolytic treatment are greatest in the elderly.[46]

Socioeconomic differences—Although data on the socioeconomic status of patients are not collected as part of the minimum contract dataset, both postcode and electoral ward are collected and can be linked with census derived measures of deprivation such as the Townsend material deprivation score. Studies investigating access to services for the management of ischaemic heart disease in relation to deprivation have produced conflicting results. Some have shown that residents of poorer areas have less access to services,[47 48] while others have shown no differences.[43] As in primary care, inequities in access to hospital services may vary between localities, reinforcing the need for purchasers to examine the use of their own services in relation to measures of deprivation.

Ethnic differences—Data on ethnic group are not routinely collected in the United Kingdom but the NHS Executive proposes to make ethnic group a mandatory item in the minimum dataset in 1995. Studies using data collected on individual patients have found that in at least one part of Britain the delay between the onset of symptoms of ischaemic heart disease and undergoing an angiogram was twice as long in patients of Indian origin than in those of European origin.[49] Indian patients were also less likely to receive thrombolysis after admission with a diagnosis of myocardial infarction.[50]

Geographical differences—Access to cardiology services also appears to be associated with area of residence. People who live near to a provider unit are more likely to receive services than those living further away.[48 51]

Other inequities—Inequities are also present in access to other types of secondary care services. Using housing tenure as measure of socioeconomic status, median survival times were similar in owner occupiers and council tenants for cancers where medical intervention has relatively little impact—such as lung cancer. For cancers where medical interventions are likely to be of benefit—such as bladder cancer—council tenants had much shorter survival times.[52] In Scotland routine data showed that young people in deprived areas had relatively high teenage pregnancy rates and a lower uptake of abortion services.[53] Few other conditions have been similarly researched in the United Kingdom, but use of maternity services and renal services are candidates for early assessment.

Discussion

We have shown how routine data can be used to identify inequities in access to and the use of both primary and secondary care for some of the most vulnerable groups of the population. We have also shown, using the example of ischaemic heart disease, how purchasers can use routine data sources to monitor inequities in the use of services by examining the process of care for major diseases and conditions. The advantages of developing a model of care approach are threefold. Firstly, purchasers can chart the main service delivery points. Secondly, they can develop true or proxy measures of need, access, and outcome at each service point. Finally, these measures of need, access, and outcome can be used with sociodemographic variables to explore the experience of health care of the many different subgroups within their resident population.

Purchasers should begin to build into the contracting process strategies and models of care which include the many facets of equity described by Whitehead.[2] This approach requires a substantial amount of work, however, and purchasers will have to collaborate with providers to define data specifications and to ensure that high quality data are used in their analyses. To achieve this quality assurance programmes aimed at improving the usefulness of NHS data will need to be set up (see box). Funds will also have to be made available for studies that investigate in more detail potential problems in provision, access, and use. The inclusion of data on ethnicity in the minimum contract dataset from 1995 is an example of how purchasers and

Process of care	Proxy measures of need, access, and outcome (Analyse by age, sex, geographical area, race)	Notes
Access to hospital care	Ratio of admission rates to death rates	Death rates are used as measure of the need for health care, with the ratio of admission rates to death rates as measure of access to hospital care
↓		
Access to angiography	Percentage of admissions investigated	Percentage of admissions investigated by angiography is measure of access to further investigation
↓		
Transfer from angiography to reperfusion treatment	Ratio of number of reperfusions to number of angiographies	Measure of likelihood of transfer from further investigation to reperfusion treatment
↓		
Access to reperfusion treatment	Percentage of admissions reperfused	Measure of access to reperfusion treatment
Outcome	Case fatality in inpatients	The only outcome measure currently available from routine data is case fatality, which can occur at any stage in the process of care

FIG 3—*Model of care approach for ischaemic heart disease describing the process of care and measures of need and access*

Framework for assessing equity

	Purchasers	*Providers*
Data specification and collection	Specification of variables and standardisation of methods of data collection	
Data accuracy	Contract specifications	Quality assurance of data collection
Analysis	Develop models of care, outcome measures, measures of appropriateness of care and analyse data (public health departments, information departments, clinical units, academic units)	
Record linkage	Develop methods to track individuals	Use of unique patient identifiers
Detailed studies	Recommendations for further research	Collaboration with purchasers and academic units
Feedback and change	Incorporate results in new contract specifications	Respond to results of analyses with appropriate actions
	Repeat the monitoring process after sufficient time for change	

providers need to plan in advance their strategies for data collection and analysis.

This paper has also shown the vital contribution of regional and national data in monitoring inequities in the provision and use of services. Both purchasers and health service researchers will need to be assured that the continuing changes in the health service will not adversely affect their access to national, regional, and local NHS data.

Purchasers and providers should use the contracting process to monitor equity systematically using measures of health status and outcomes, data on the use of health services, and small area census statistics. When inequities are identified purchasers should carry out collaborative audits with providers to determine the appropriateness of the care received by their residents, and the results should be fed back into the contracting cycle. By doing this better decisions can be made about where resources should be directed locally and how best they should be used. Most importantly, only in this way can the central tenet of equal access for equal need be pursued within the NHS.

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