

## **Chapter 7: The role of the NHS in reducing inequitable receipt of health care**

### **Introduction**

Inequalities in health are compounded by inequalities in access to health care. Whilst societal factors may be the key determinant of disease incidence rates, health care provision plays a key role in secondary and tertiary prevention and to a lesser degree in primary prevention.

### **Importance of new health technologies in reducing mortality, morbidity and quality of life**

There have been marked improvements in both life expectancy and disease-specific mortality rates over the last 100 years. A cohort of men and women born in 1901 would have an expected average life expectancy at birth of 51 and 57 years, respectively. By contrast, the same cohort born in 1990 would expect, on average, to live for 77 and 83 years (Charlton and Murphy, 1997). However, as has been shown in Chapter 1, these improvements have been greater for more affluent members of society.

Health improvements are the result of both a reduction in disease incidence (number of new cases of disease) and reduced case fatality due to a combination of less severe disease and more effective treatments. An individual today is far less likely to contract certain diseases but, even if they do, they have a better prognosis and quality of life.

It is generally accepted that medical care has made only a limited contribution (McKeown *et al*, 1975; Mackenbach *et al*, 1990) to these marked secular trends (see earlier chapters in report). The proportion which may be attributed to societal changes rather than medical care remains controversial. However, recent advances in both surgical and medical interventions have led to a re-evaluation of medical services in terms of both preventing disease as well as reducing case fatality and improving quality of life.

Time trend analysis of mortality rates in five countries which have experienced marked growth in health services noted that the rate of decline for mortality that was potentially amenable to medical intervention was far more rapid than mortality for other causes (Charlton and Velez, 1986). However, the relationship between health care resources and "*avoidable mortality*" is weak, suggesting that how resources are used (quality of care) rather than the total allocation may be more important (Mackenbach *et al*, 1990). Calculations on the gains in life expectancy and quality of life associated with various interventions estimate that medical services in general add around five years of life expectancy, with the potential of another two or two-and-a-half years by extending access to effective treatments (Bunker *et al*, 1995). For example, it is possible to attribute around 3.5% of the decline in CHD mortality to the contribution of coronary artery bypass grafting (Goldman and Cook, 1984). Extending care to include surgery, medical treatments and coronary care units, it is estimated that life expectancy is prolonged by an additional 1.2 years at a population

level, with around a 55% improvement in quality of life (Bunker *et al*, 1995). More dramatically, Capewell and colleagues (2000) have calculated that approximately half the decline in CHD mortality fall in New Zealand was attributable to medical therapies whilst the other half related to risk factor reductions.

Given the growing evidence base for effective medical therapies, it is essential that such services are provided to all on the basis of clinical need.

- *Most effective medical interventions do not reduce disease incidence risk but may improve prognosis and quality of life through secondary and tertiary prevention.*
- *In order to reduce health inequalities it is essential that all segments of society share equally in these advances on the basis of clinical needs and not be influenced by spurious socio-demographic factors*

### **Understanding the language and concepts around inequitable access to health care**

It is important to be clear about the terminology used to discuss inequalities in health care. The debates around this topic tend to use the following terms (*need, demand, provision, variations, access, equity or inequity*) in a relatively inconsistent fashion. It is therefore important for the reader to understand how they will be used in this report.

*Need* is the concept that a patient has a clinical condition for which there is an effective intervention. It is therefore distinct from *demand* which indicates a patient's desire or preference for an intervention which may or may not be needed. *Provision* reflects the process of actual medical care and hence is a major contributor to the spending of health care resources.

Much early work in this area focussed on the topic of *variations* in health care provision (McPherson *et al*, 1982). This simply documents how rates of interventions, *eg* hysterectomy, vary both between and within countries. As such, this work has been generally used to demonstrate the importance of 'doctor-related' factors in influencing medical interventions. In other words, the rates of variations are often so large, it is assumed to be unlikely that these variations reflect true 'need' but rather that doctors vary in their propensity to intervene for identical clinical scenarios. Therefore, surgeon X is more likely to operate on the same patient than surgeon Y. Clearly, resource issues, number of available beds, etc, as well as patient demand may influence this process but the main factor was assumed to be doctor-related. Such work, whilst enlightening, does not directly measure either *access* to or *equity* in health care.

'Access' is defined as the ability to make use of provided services and/or information, for example, attend general practice clinics or travel to hospital clinics. It reflects both patient socio-demographic factors, such as living in a rural area, as well as structural factors, such as the local provision of diagnostic tests, interventions or

health care professionals. For example, if an area does not provide certain services, then patients in that area have no access to this regardless of whether or not this is equitable. 'Equity' or its counterpart, 'inequity', reflect a mismatch between need and provision, at any given level of access, so that patients' socio-demographic characteristics have an influence on their receipt of health care over and above their need. It may or may not be a reflection of access, demand or doctor behaviour. It is a measurable facet and hence has led to the concept of 'equity audits', distinct from clinical audit, which simply examines patterns of health care provision related to accepted consensus standards of care.

The critical conceptual issue around determining whether health care provision is equitable is dependent on the following question. Is the level of service provision commensurate with the clinical need? As Benzeval *et al* (1995) aptly state:

*“What is not in doubt is that more disadvantaged social groups have higher than average rates of both morbidity and service use. The analytical problem arises in adjusting the one for the other.”*

#### **Domains of inequities – socio-economic status, gender, age, ethnicity, geography**

Most research around equity of health care has focussed on the following domains: (a) area measures of deprivation, (b) individual measures of socio-economic status, (c) gender, (d) age, (e) ethnicity and (f) geography (rural versus urban).

Each socio-demographic factor may play an independent role or may confound each other. For example, a recent observational study from Yorkshire noted that women after a myocardial infarction were less likely than men to be treated with thrombolytic therapy, aspirin or beta-blockers (Hanratty *et al*, 2000). However, after adjustment for age, as women were older than their male counterparts, this disparity in treatment was almost abolished. However, these factors may also interact so that patients may experience a 'double whammy'. Poor ethnic minority patients may be much worse than either poor patients or those from an ethnic minority *per se*.

#### **Relevant examples of important interventions at primary, secondary and tertiary care levels**

Much research has focussed on specialist or tertiary level interventions as they are costly and generally have a high profile. For example, there has been much work on coronary artery bypass grafting, renal replacement therapy and specialist oncology treatments. However, it is important to appreciate that less glamorous interventions at secondary care, *eg* hip and lens replacement are also important in alleviating pain and suffering. Primary care also has a key role both as the gatekeepers to specialist services but also in the provision of most pharmacological treatments, *eg* effective management of hypertension, as well as health promotion.

- *Health care provision must be commensurate with clinical need and unbiased by socio-economic status. A mismatch between need and provision is inequitable.*

- *Evidence of clinical effectiveness is essential in interpreting patterns of service provision by socio-economic status as overprovision may be as harmful as under-provision.*
- *Inequity can function at various different domains such as age, socioeconomic status, geography, ethnicity and gender. These domains may act independently or additively.*
- *Inequity can occur at primary, secondary and tertiary care levels within the NHS.*

### **International and UK evidence of inequitable health care**

It is unsurprising that the first evidence supporting inequitable health care came from the USA where the two-tier health care system ensures a large vulnerable segment population who may not be able to afford major care expenditure (Hayward *et al*, 1988). In the UK, it is assumed that a free health care system will not deter poorer individuals from treatment. However, observational data consistently indicate that socio-demographic factors such as socio-economic status (Ben-Shlomo and Chaturvedi, 1995), gender (Petticrew *et al*, 1995), ethnicity (Shaukat *et al*, 1993) and other factors such as smoking status (Morris *et al*, 1995) have an influence on the likelihood of receiving health interventions.

Surprisingly, researchers have only recently begun to address methods to explicitly monitor equitable access to NHS services. Simulation models suggest that UK health system does broadly provide equal treatment for equal need (Propper, 1994). However, inequities appear to exist both for receiving surgery for heart disease (Ben-Shlomo and Chaturvedi, 1995) and other common conditions (Chaturvedi and Ben-Shlomo, 1995). Men living in more affluent areas were more likely to receive coronary revascularisation surgery despite having less need as measured by mortality rates (Ben-Shlomo and Chaturvedi, 1995). A more recent study has confirmed these findings with better data indicating that the most deprived wards had only about half the number of revascularisations per head of population with angina (Payne and Saul, 1997). In affluent wards, individuals with symptoms had almost three times the rate of coronary angiograms than those in poorer wards. Similarly, Asian patients with heart disease appear to wait almost twice as long from symptom onset to being seen by a cardiologist (Shaukat *et al*, 1993). Women are also less likely to receive surgical intervention for heart disease, even when they have had a heart attack (Dong *et al*, 1997) and have similar or worse prognosis to men (Hanratty *et al*, 2000).

A systematic review of equity of access to health care in the NHS published in 1998 (Goddard and Smith, 1997) concluded that, despite efforts to promote equity in resource allocation within the NHS and to maintain the principle of fair access,

*“We have indeed found substantial recent evidence of certain inequities in access to health care in England...”*

However, the same review identified that research in this area was not systematic. Most work had been in the areas of acute medicine or common adult surgical

conditions, ignoring vast areas of clinical work such as paediatrics, obstetrics and gynaecology and mental health. The report also highlights the difficulty of establishing the relative *importance* of identified inequities in terms of public health benefit.

### **Potential reasons for inequitable health care**

If we are to provide effective interventions that counter inequitable patterns of health care it is essential to understand the possible mechanisms behind these patterns. As the process of receiving health care is complex, it is necessary to break it down into its constituent parts so that one can identify barriers to equitable care. Below is a theoretical outline for potential problems, although little if any empirical work is available to test these various possibilities.

1. Patient variations in health care seeking behaviour
2. Doctor-patient interactions at a primary care level
3. Variations in primary care referral patterns
4. Variations in levels of investigation
5. Deciding on treatment options
6. Patient preferences

### **Review on role of health care based interventions to reduce inequalities in health**

A recent Department of Health commissioned review examined all studies with an experimental design that targeted poorer sections of the population in order to reduce inequalities in health (Arblaster *et al.*, 1995). From a large number of original papers, only 94 studies could be identified that met the inclusion criteria and many were of dubious methodological quality. The characteristics that were found to be associated with greater success were (a) needs assessment and community commitment prior to the intervention, (b) intensive, multidisciplinary, multifaceted, interventions delivered in a variety of settings, and (c) face-to-face, culturally appropriate interventions delivered by an appropriate agent with sufficient training. The authors concluded that:

*“it is important that strategies developed to reduce inequalities are not assumed to be having a positive impact simply because the aim is ‘progressive’ and so rigorous evaluation evaluations of promising interventions are important.”*

The paucity of evidence in support of interventions to reduce inequalities has led some to take a nihilistic view of health service interventions (Foster, 1996). Unfortunately, most randomised controlled trials do not explicitly address the issue of effectiveness by socioeconomic status and often fail to present results by relevant sub-groups. In addition, participants in trials are often unrepresentative of the general population. A recent re-analysis of the MRFIT trial clearly indicated an under-representation of poorer groups. However, despite the selection biases, limited evidence suggests that improvements in diastolic blood pressure, smoking cessation, and LDL-cholesterol, *seen under trial conditions*, are very similar for both well educated and less educated subjects; education being used as a marker of socioeconomic status (Cutler and Grandits, 1995).

- *Despite the NHS providing service free at the point of delivery, there is convincing evidence of inequitable health care provision. This is not uniform and there are no clear systematic reasons for discrepancies.*
- *The reasons for such inequities are complex and may be the result of patient and doctor related factors.*
- *There is a paucity of good quality evidence on how to reduce such inequities.*

### **Case studies: empirical examples illustrating areas of concern**

The following provide some examples from the published literature of different approaches to assessing the nature and degree of inequitable access to health care. It is important to appreciate that these examples merely highlight areas of concern which deserve further investigation, rather than provide definitive explanations as to why these patterns occur. This is clearly an essential prerequisite before more detailed studies are undertaken. Similarly, such approaches can be used to monitor changes in clinical guideline or policy changes.

#### *Preventative care*

It is traditionally accepted that most health education or promotion campaigns paradoxically increase the gap between rich and poor. The latter find it much harder to alter lifestyles or cannot afford healthier options such as diets rich in fresh fruit and vegetables. Screening and childhood vaccination campaigns are often less successful amongst poorer segments of society (Waller *et al*, 1990). Such differences are not insurmountable with additional effort and resources. For example, the use of home visits by district nurses was able, in one practice, to diminish much of the gap in vaccination rates between less and more affluent communities (Marsh and Channing, 1988).

Both practical and financial disincentives are important when considering reasons for differential use of services. A recent case control study of patients presenting with marked visual loss due to glaucoma noted that cases were much more likely to be of lower socio-economic status and of African Caribbean origin (Fraser *et al*, 2001). Some of these social differences were explained by the reduced likelihood for cases to have regularly visited an optometrist for a regular eye check up. At the time this study was undertaken, only individuals on Income Support would have been exempt from eye charges, though this has now been extended to all people over 60 years of age. It will be interesting to note whether the increased frequency of visual loss due to glaucoma amongst poor patients will be eliminated since the removal of charges.

#### *Primary care*

There has been a long standing debate about the equity of access to primary care (Collins and Klein, 1980; Blaxter, 1984). There is little doubt that patients of lower socio-economic status, ethnic minority status and women have higher attendance rates (McCormick *et al*, 1995). What is more problematic to decide is whether this is as great as one would expect given their respective levels of morbidity. However, there is little evidence about whether the quality of care differs between socio-demographic

groups. Indirect support for such a hypothesis comes from examining referral patterns to secondary care. As primary care acts as the gate keeper to other services, any differential pattern of referral will have a marked influence on differential receipt of surgical or more complex medical investigation and care. Both a local study based in North London (Worrall *et al*, 1997) and more generalisable data from the Fourth National Morbidity Survey (Carr-Hill *et al*, 1996) suggest that, for consultations rated as non-trivial, poorer patients were less likely to be referred to a specialist given their higher attendance rates.

This observation is consistent with a study from South Glamorgan, which examined the patterns of emergency and elective admissions by an area-based measure of social deprivation in relation to diabetes and other illnesses (Morgan *et al* 1997). The rate of in-patient admissions was strongly positively related to increasing deprivation (correlation coefficient for non-diabetic patients 0.74,  $p < 0.001$ ) This is unsurprising given the association with morbidity. This linear association was even stronger with emergency admissions (0.87,  $p < 0.001$ ) but non-existent for elective admissions (0.06,  $p$  value reported as non-significant). These results were almost identical for the diabetic population but, in this case, there was a weaker positive association with elective admissions (0.30,  $p < 0.05$ ). This suggests that, in general, poorer areas with disease are less likely to be managed electively either because of late presentation by patients, failure to attend clinics or delays in referral. The study also noted that rates of non-attendance at out-patients was also strongly related to area deprivation. However, structural factors, like late notification of appointments, is an important determinant of failure to attend and may have a greater effect on patients of lower socio-economic status (Frankel *et al*, 1989). However, for the diabetic population, who are under more extensive scrutiny through regular out-patient clinics, this is less of a problem.

A more sophisticated approach to measure access to good quality primary care has been to examine conditions that may result in hospital admission if badly managed either by patient or physician at a community level. Such conditions include admissions for asthma, diabetes and angina. These studies repeatedly note that poorer areas (Ricketts *et al*, 2001) or poorer individuals are more likely to have such potentially 'preventable' admissions (Bindman *et al*, 1995) and, in the case of the individual-based study, were less likely to have seen their primary care doctor in the period preceding their acute illness. The ecological study failed to show that provision of subsidized clinics or the number of primary care doctors per 1000 population made any difference in the rates of hospital admissions (Ricketts *et al*, 2001). This disappointing observation must be tempered with the knowledge that poorer areas may also have more severe disease as well as the problems of poorer individuals in complying with expensive drug regimes and regular clinic follow-up within the American health care system. Such studies have so far been limited to the USA where limited health care insurance is a major issue.

There is little evidence to suggest that poorer individuals or those from ethnic minorities are any less willing to seek their General Practitioner or Accident & Emergency care when presented with a hypothetical health problem (Chaturvedi *et al* 1997; Adamson *et al* 2000). It is likely that, in this country, where structural and financial barriers to primary care are not such a major problem, any association between admission rates for preventable conditions may be a better reflection of

quality, use and patient compliance with primary care services as well as disease severity.

#### *Primary and secondary care interface*

Asthma is condition of major importance, which can be well managed through good primary and secondary care services. Some - but not all - studies show associations with social deprivation (Duran-Tauleria and Rona, 1999) particularly for persistent wheeze. This suggests that poverty is either associated with more severe disease or that individuals in poorer areas are less recognised and/or sub-optimally managed. A study from Wales also noted that admissions for asthma were strongly correlated with area deprivation at all ages, whilst the prevalence of reported asthma and various degrees of wheeze was not significantly correlated with area deprivation (Burr *et al*, 1997). Importantly, there was a non-significant negative association between deprivation and regular use of inhaled steroids. Thus asthmatic children in poorer areas were probably less likely to receive prophylactic medicine that could either prevent an asthmatic attack or reduce its severity and hence the likelihood of hospital admission or mortality. Such studies merely highlight the possibility of less equitable care in poorer areas but do not exclude other possible explanations, such as less good compliance with medication.

#### *Secondary care*

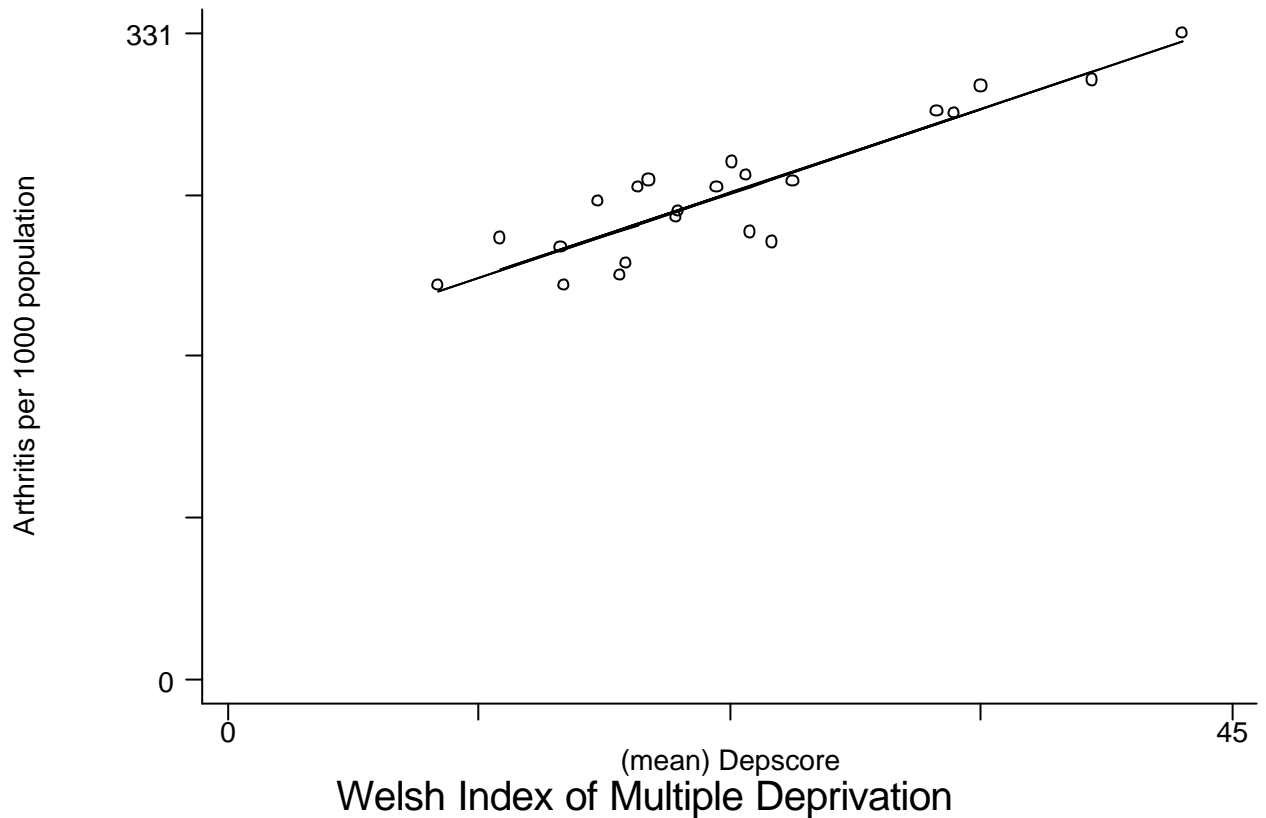
Remarkably little research has examined equity of access to common secondary care conditions. Surgical conditions are easier to study as misclassification is less of an issue and it is possible to relate disease morbidity to a specific intervention.

By comparing rates of primary care consultations and surgical intervention for specific conditions, *eg* cataract, hip replacement and varicose veins, it is possible to show both concordant and discordant patterns of care (Chaturvedi and Ben-Shlomo, 1995). One condition of note was hip replacement, which demonstrated reduced rates of surgical intervention for poorer areas. This was despite greater rates of primary care consultation for poorer individuals. This apparent mismatch has been confirmed in a broader geographical analysis (Jacobson, 1999) as well as examining data from Wales.

Preliminary analyses of crude prevalence rates per 1000 population for arthritis (not including back pain), taken from the 1998 WHS show a positive correlation with deprivation scores by UA, using the Welsh index of multiple deprivation (National Statistics, 2000) as set out in Figure 7.1.

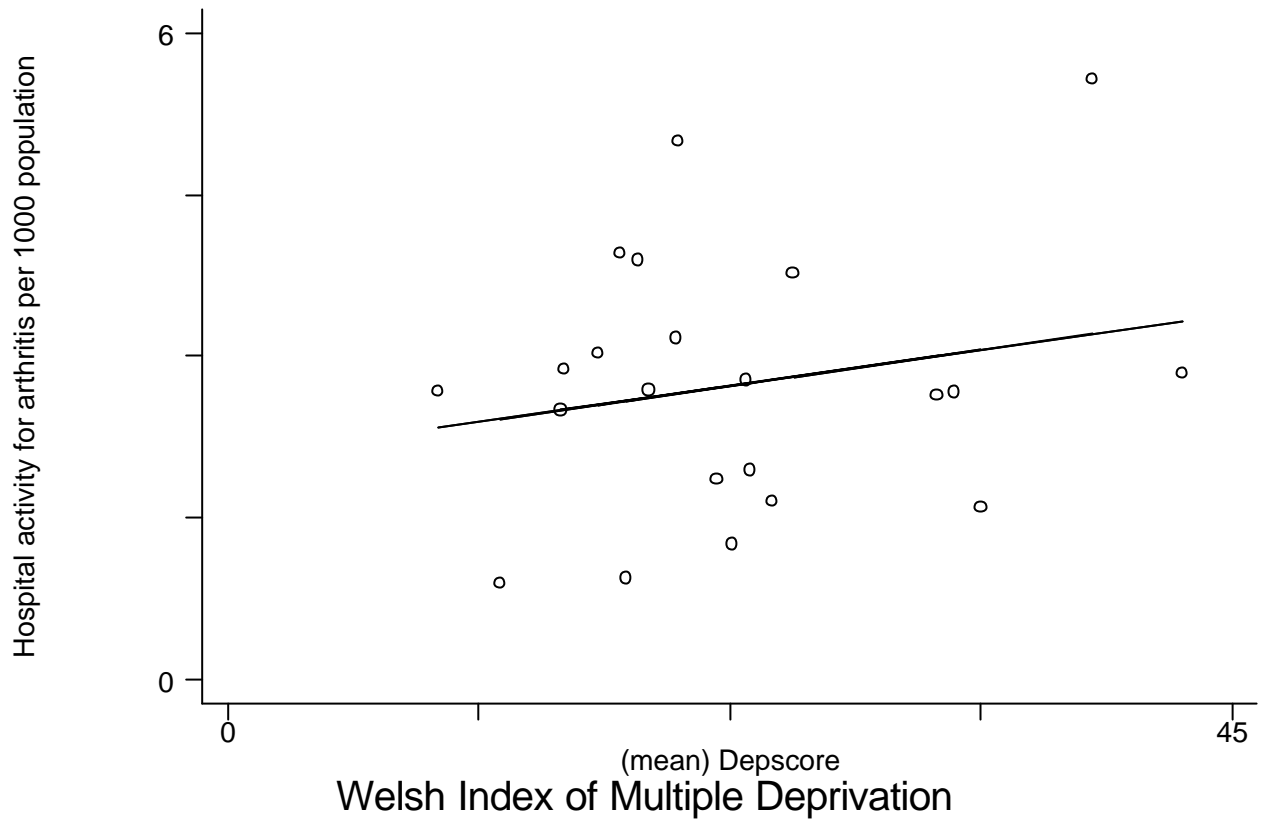
**Figure 7.1: Association between self-reported arthritis morbidity and area deprivation score by Welsh Unitary Authorities (higher values of deprivation score equate with greater deprivation)**





Whilst this question does not measure arthritis of the hip directly, this is likely to be a major contributor to the proportion of all arthritis morbidity. Similarly, no data is directly collected on pain or limitation of daily activities, although the SF-36 questionnaire, which is also included in the WHS provides some information on these topics. Further analysis of the original data could therefore be used to identify positive respondents who suffer significantly from their arthritis. Other data demonstrate that poorer individuals are not only more likely to have arthritis of the hip but their condition is also more likely to be of greater severity and hence more suitable for effective surgical intervention (Eachus *et al*, 1999). Crude hospital activity data (provided by Steve Sutch for 1998) also demonstrate increased hospital activity for osteoarthritis, which will mainly relate to hip or knee replacement, by area deprivation as one might expect (see Figure 7.2).

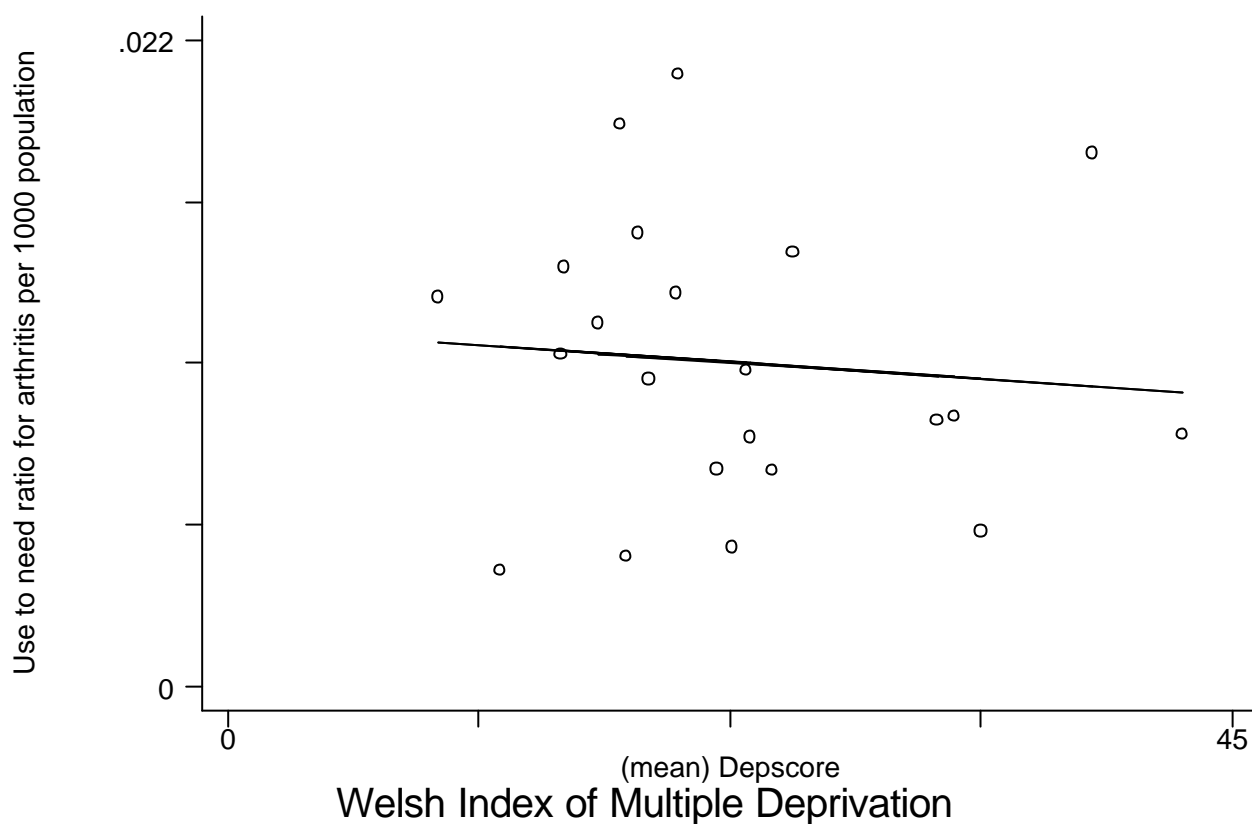
**Figure 7.2: Association between hospital activity data for osteoarthritis and area deprivation score by Welsh Unitary Authorities (higher values of deprivation score equate with greater deprivation)**



The association is much weaker given the greater scatter and less steep gradient for the regression line.

When these data are examined as a ratio of hospital activity with respect to self-reported morbidity ('use to need') we observe an inverse association so that so that poorer areas have rather less hospital activity given their much higher levels of morbidity (see Figure 7.3).

**Figure 7.3: Association between use to need ratio for arthritis and area deprivation score by Welsh Unitary Authorities (higher values of deprivation score equate with greater deprivation)**



*(NB. These analyses have not been standardised for age and sex and require more detailed work so that specific operative procedures are examined rather than the broad associated DRG. In addition, HES data may be inaccurate and incomplete, so that it is important to ensure that such patterns are not artefactual due to poor quality of information. However, these marked patterns are unlikely to be fully explained by artefact)*

#### *Tertiary care*

Several studies have highlighted that access to specialist areas such as coronary artery bypass grafting is inequitably distributed in relation to morbidity and area deprivation. In addition, geographical proximity also increases the probability of receiving such interventions. Such services are usually based at teaching hospitals which are often located in poor inner city areas, providing some degree of compensation (Ben-Shlomo and Chaturvedi, 1995). However, poor rural areas may be at most disadvantage in receiving such distal services. Whilst it is not totally clear where the barriers to intervention exist, it is likely to be at the angiography stage as once there is clear radiological evidence of disease, management is less likely to be distorted by other socio-demographic factors other than co-morbidity and smoking behaviour which may confound socio-economic status.

There is evidence that survival from several different cancers is also related to area deprivation. For example, significantly lower survival has been observed for colorectal, breast and bladder cancer but not lung cancer (Pollock and Vickers, 1997, Kogevinas *et al*, 1991). This is most evident for cancer sites where early intervention may be of some benefit. Again, the interpretation of this observation is complex and may relate to more aggressive disease in poorer individuals, worse co-morbidity or poorer compliance with treatment. However, there is evidence that management at specialist multi-disciplinary units is associated with better outcomes and hence it is vital that differential access to such care is not the reason for such worse outcomes (Selby *et al*, 1996).

## **Methods to tackle inequitable health care**

### *Establishing priorities for interventions*

The starting point for any policy to redress inequities in health care is to establish what areas of NHS activity are of major Public Health importance in terms of activity, cost and potential for intervention. This will require the analysis of routine data sources on hospital admissions, prescribing data, primary care provision and community health care services. For the sake of comprehensiveness, it is recommended that all major speciality areas: general medicine (including care of older people), general surgery (including orthopaedics), obstetrics and gynaecology, paediatrics, oncology and mental health are included in such a review as it is easy to omit some areas of health care, *eg* mental health, which may be perceived as Cinderella services.

### *Integrating top-down and bottom up approaches*

Certain areas should be identified as priorities based on their public health importance or may be established through top-down initiatives such as the recent National Service Frameworks. However, it is also important to consider areas of local priorities, through involvement of both local clinicians, public health physicians, Health Authorities, patient groups and local community representatives. Bottom-up perceptions of a poor or inequitable service are equally valid even if subsequent monitoring fails to substantiate such claims. High profile cases of 'post-code' prescribing of expensive new treatments may predominate attention, even though they affect few individuals. Such cases are better dealt with through National or Regional guidance. Another area of local concern often relates to equity of structural factors such as the number of General Practitioners per 1000 population or the need to refurbish local hospitals. There is evidence that poorer areas tend to have worse access to primary care structures (for example, Benzeval and Judge, 1996). Such issues are clearly important and of local relevance. As such, they may be more easily identified and potentially tackled but avoid the more complex problem of measuring quality of care, which is ultimately of greater importance.

## **Establishing valid equity indicators of quality of health care treatment**

It is essential to establish valid equity indicators that are comprehensive and wide ranging. Because of the enormous diversity of medical activity, it will never be possible to examine more than a small range of possible areas. A strategy of regularly

monitoring major areas as well as sporadically monitoring possible problem areas is probably the best manageable approach.

#### *Properties of an ideal indicator*

Any ideal indicator for measuring and monitoring inequitable access to secondary health care should address the following six issues: It should (i) examine a condition which makes a substantial contribution to public health and is a major component of health care activity; (ii) choose an intervention that has been demonstrated to be clinically effective either in terms of reducing mortality, morbidity or improving quality of life; (iii) accommodate existing epidemiological data on the morbidity or need for intervention by various socio-demographic domains, such as socio-economic status, gender, age, ethnicity and geography (urban versus rural) as it is only with these data that one can even attempt to interpret the patterns of health care provision; (iv) have routinely available data on need or a proxy measure of need; (v) be relatively robust to artefactual variations simply as a result of random variation; (vi) be relatively easy to interpret with some measure of its potential policy implications.

#### *What really works?*

For each potential indicator, it is essential to ensure that existing evidence demonstrates its clinical effectiveness. This may be undertaken at a national level, through recommendations by the National Institute of Clinical Excellence or locally, by examining existing sources of high quality secondary research into clinical effectiveness: the Cochrane Library, clinical effectiveness reviews, evidence-based medicine journals. Potential indicator groups may be excluded at this stage if there is insufficient evidence of clinical effectiveness to support their inclusion as a measure of equity.

#### *Who needs it?*

There is already a body of existing epidemiological literature on the distribution of the disease, or the indications for treatment, in the UK with specific reference to gender, age, socio-economic group, ethnicity and geographic location. For example, published research work based on the SASH study could be used to develop a basic need-model for osteoarthritis of the hip and knee (Frankel *et al*, 1999). Where no UK data are available, data from other countries could be used assuming that whilst absolute levels of disease may differ, the relative rates between socio-demographic groups may still be valid. It may not be possible to derive such measures for all indicator groups and, again, some potential indicator groups may be excluded at this phase on the basis of insufficient knowledge of the epidemiology of these conditions.

#### *Comparing need with provision*

Routinely available datasets such as hospital episode statistics (HES) can be used to calculate age adjusted provision rates at an area level. In some cases, data already within HES can be used as a good proxy measure of need, *eg* admissions for myocardial infarction and unstable angina for heart disease. External data will also be required, such as that available from prescribing. Drug prescribing data can be used both as a proxy measure of need or itself may provide outcome data on intervention if this is a pharmacological intervention. Similarly, data from the WHS or, if necessary, the Health Survey for England, can provide rates for some causes of morbidity by age, gender, socio-economic status and geography. Using these sources of information, it

is possible to compute 'provision to need' ratios for different socio-demographic domains (see Figure 7.3) at various levels of health care provision (Ferris *et al*, 1998).

The lowest geographic level of data organisation available within the HES data extract is ward, allowing aggregation to reflect other area classifications such as unitary authorities, or primary care groups. The robustness of each measure at different levels needs to be examined due to random variation because of small numbers of some events. Event rate ratios (and confidence intervals) can be calculated by Poisson regression modelling. Given the hierarchical nature of the data (*eg* wards within DHAs within Regions), multi-level modelling may also be appropriate.

The relative index of inequality, a tool used to quantify social inequalities in health, can be used to examine the magnitude of inequities. This calculates the difference in the number of events observed compared to expected assuming equal levels of morbidity across all socio-demographic domains. If there is equitable access, the need to provision ratios should all be around one across groupings (*eg* quintiles of area deprivation).

- *Identify an area of public health or local importance*
- *Determine the epidemiology of the condition or proxy measures of need*
- *Determine whether there is evidence of effective interventions at any level of prevention and symptom relief*
- *Undertake an equity audit to examine whether there is a mismatch between need and provision*
- *Introduce either top-down or locally sensitive guidelines to address any observed discrepancies*
- *Review barriers to implementing policy.*

### **Policy implications**

Having identified important health care areas for which there is reasonable evidence that provision is not equitable, it is necessary to consider what interventions are likely to redress the problem.

#### *At a clinical level*

One obvious and simple way of reducing potential inequities of service delivery is by the use of explicit guidelines on referral and treatment criteria. Whilst it is not always easy to get clinicians to apply guidelines, it is clear that such a method may prevent extraneous demographic factors influencing the provision of health care.

The Hypertension Detection and Follow-up Program provides a case study example that medical care can help eradicate socio-economic differences in mortality by the

appropriate management of hypertension (Hypertension Detection and Follow-up Program Cooperative Group, 1987). This randomised controlled trial, set up to examine the role of effective management of hypertension, compared patients randomised to either routine care (referred care) with a protocol-led guidelines approach (stepped care). This study had no *a priori* objective to examine whether such differences may help reduce inequities in health care.

Amongst the group who received routine medical care (referred care) there was a two-fold mortality gradient based on whether the subject did or did not receive high school education. In contrast, the special (stepped care) group showed almost non-existent gradients amongst both black and white subjects. Similarly, the SHEP anti-hypertension trial also found similar reductions in cardiovascular mortality for both educational groups with the less educated group showing, if anything, larger benefits (Cutler and Grandits, 1995).

Most recently, a large prospective study of patients undergoing angiography in London has highlighted the potential benefits of implementing consensus treatment guidelines (Hemingway *et al*, 2001). A nine member expert panel rated the appropriateness of revascularization as compared to medical therapy for a wide variety of clinical scenarios. Patients of non-white ethnicity, who were regarded as appropriate for either angioplasty or bypass grafting, were significantly less likely (between 5% to 6%) to be given revascularisation than their white counterparts. This was not explained by other confounding factors. Medically treated patients of all ethnicities, who were deemed by the expert panel to be suitable for surgical treatment, were more likely to remain symptomatic and, in the case of bypass grafting, to die or have a non-fatal heart attack. Had black patients been managed using the panel algorithm they would have been more likely to have received surgical treatment and had a better prognosis.

*At a management level*

Differences in equity of health care are not inevitable and have not always been found. In Northern Ireland, no differences were noted in access to coronary revascularisation surgery by area deprivation (Kee *et al*, 1993). A recent report from Finland similarly failed to find differences in the survival of diabetics by socio-economic status (Koskinen *et al*, 1996). Equitable health services has been an important goal in Finnish health policy for decades. This suggests that health care purchasers must not only explicitly contract for equitable service provision but also take an active role in monitoring this both through routine activity data and equity audits working with provider units (Majeed *et al*, 1994).

*Collaborative working between purchasers and providers*

	<b>Purchasers</b>	<b>Providers</b>
Data specification and collection	Joint task	
Data accuracy	contract specification	QA of data

Analysis	Joint task	
Record linkage	Develop methods of tracking	
Detailed studies	specify further research	collaborate
Feedback and change	Incorporate findings	respond to findings

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Adapted from Majeed *et al* (1994)

Recent statements on national health policy have made it clear that “*providing equitable access to effective care in relation to need should be a governing principle of all policies in the NHS*”. This reinforcement of a long-standing principle has been combined with a commitment to monitor health service equity in practice. This is to be achieved at a high level through the inclusion of measures of “*fair access to services*” as performance indicators for NHS organisations, and locally through the development of equity profiles by Directors of Public Health, working on behalf of Health and Local Authorities. Initial measures of health service equity have been proposed and condition-specific high-level indicators have been recommended in the National Service Frameworks for Mental Health and Coronary Heart Disease. However, early indicator measures have been relatively crude and have not been validated by thorough methodological work. The development of valid, evidence-based measures of health service equity is clearly a priority for NHS policy makers and planners. The high costs of establishing new information to monitor equity means that the best use must be made of existing data.

### **Implications for data information requirements**

Any effective monitoring process is reliant on good quality data. There are a wide variety of data sources for Wales that could be used for establishing and monitoring equity of access to health care (eg Welsh Health Survey, Cancer registry, mortality data, Welsh hospital episode statistics, Prescribing data, Primary care networks, etc). During the process of writing this section of the report, it became clear through discussions with relevant parties working in Wales that there is much opportunity to improve current information systems. The development of future health care information systems may greatly aid this task. It is essential that future developments in this area take into account the possible needs of monitoring equity prospectively rather than *post hoc*.

Most information systems rarely record any measure of disease severity or functional limitation beyond the crude diagnostic label. In particular, there are major problems in recording socio-economic status and ethnicity. This is the reason why most studies have been reliant on area based measures of deprivation. This is adequate for most purposes but does not exclude the ecological fallacy, that a measure of the group may not reflect the individual. For example, within poor areas, it may be the most affluent individuals who receive treatment. The implementation of specially designed software that prompts occupational details for successful classification could greatly enhance the collection of such data *if* it is seen as relevant to health care providers.



Information linkage mechanisms between primary, secondary and tertiary care would enable synthetic disease cohorts to be established at relatively low cost. This would enable one to monitor the natural history of disease and treatment by equity domain. Primary care trusts may be ideal settings for such linkage but would need to pool information for other than the most common diseases.

Nothing has been so far mentioned about private health care. This is because nearly all studies in this area have simply not had any data on this sector. Absence of inequalities within the NHS may obviously be misleading if total health care activity, including the private sector, is mismatched to clinical need. Because of the commercial sensitivity of private sector data, little progress can be made until Government pressures force all health care providers to private relevant key data to enable monitoring of the whole population and not just the NHS component.

### **Conclusions and way forward**

Despite equity being one of the founding principles of the NHS (Whitehead, 1994), there has been relatively little attention paid to it until recently. Much rhetoric is espoused about the importance of equitable access yet, despite a free health care system, there does appear to be evidence that, for some conditions, socio-demographic factors effect the likelihood of access to effective health care interventions. Rapid improvements in recent health care technologies suggest that, whilst disease incidence by socio-demographic groups may not be much changed by the NHS, case fatality and quality of life may be ameliorated. Such benefits are not just restricted to high cost interventions but apply to low cost interventions such as aspirin for secondary and tertiary prevention of heart disease.

Effective expenditure of health care resources depends on ensuring that the right interventions are given to those patients who have the greatest clinical need. This is particularly relevant to interventions where any clinical benefit must be counterbalanced by a potential adverse effect. In such cases, the cost benefit ratio or numbers need to treat to benefit are usually maximal when applied to patients with more severe disease or higher initial risk. In general, poorer patients not only have more disease but disease of greater severity. Thus, in the absence of detailed clinical information, it is reasonable to expect poorer individuals or poorer areas to receive relatively more health care interventions in proportion to their greater need. If this is not the case, then not only do we fail to achieve one of the fundamental moral principles of our health care system but also provide a less efficient service. It is essential that necessary monitoring structures are set in place both at a District and Regional level to ensure that equity of care remains a priority issue that is repeatedly re-examined. Only active monitoring can determine whether current provision is genuinely equitable. Such a process needs to be centrally coordinated but sufficiently flexible and receptive to local variations, enabling both top-down and bottom up areas to be identified. Adequate clinical information needs to be available as well as careful selection of indicator conditions. Once mismatch of need and provision has been identified, it is important to understand the reasons behind it. Both patient and clinician factors may be relevant. Institution of clear and accepted guidelines, or care pathways, are likely to be the most effective method to abolish such inequities, although this requires further empirical validation.