

EQUITY IN THE FINANCE AND DELIVERY OF HEALTH CARE: SOME TENTATIVE CROSS-COUNTRY COMPARISONS

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I. INTRODUCTION

Equity is widely acknowledged to be an important goal in the field of health care. Indeed, McLachlan and Maynard (1982) have gone so far as to suggest that 'the vast majority of the population would elect for equity to be the prime consideration' (p. 556)—a view endorsed by Mooney (1986, p. 145). Several researchers have investigated how successful their own country's delivery and/or financing system is in achieving its stated equity goals. In general the strategy of these studies is to compare the current

situation with some ideal or 'target' situation. Le Grand (1978), for example, in what has become a classic study in the field, compares the distributions across socio-economic groups of illness and public expenditure on health care in Britain in 1972, and concludes that the National Health Service (NHS) has failed to achieve equity in the delivery of health care.²

Though studies such as Le Grand's are extremely valuable, an arguably more interesting strategy is to compare the current situation, not simply with

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² Le Grand finds that 'the top socioeconomic group (professionals, employers and managers) receives 40 per cent more NHS expenditure per person reporting illness than the bottom one (semi-skilled and unskilled manual workers)' (Le Grand, 1982, p. 46).

some ideal distribution, but with a situation that prevailed before (for example: is the NHS becoming more or less equitable?) or with the situation prevailing in other types of health care system (for example: does the NHS fare better than the French health care system?). In other words, studies of a *comparative* nature may be more relevant for policy purposes than studies appraising a system only relative to some ideal (and possibly unattainable) state.

Under the auspices of the European Community (EC), researchers from ten countries have recently begun collaborating on a comparative study of this type.³ The project's initial aim is to facilitate comparisons of the distributional consequences of alternative health care financing and delivery systems. Later it is planned to examine the distributional consequences of specific cost containment measures. It is hoped that the project will allow participants to address issues such as: would country X's equity goals be better served if it moved closer to country Y's delivery system? If so, which particular facets of the delivery system should it try to emulate? Would adoption by country X of country Y's financing system be desirable given country X's equity objectives? What can country X learn about the distributional effects of co-payments from country Y's recent experience? And so on.

The idea of a comparative study of health care systems is, of course, not a new one. The EC study differs, however, from the majority of previous comparative studies in at least three respects. First, it has distributional themes as its prime concern. Though there are exceptions (see e.g. Le Grand and Rabin, 1986; Le Grand, 1987a), previous studies have tended to be directed at other issues (Culyer, 1987, p. 26). The studies of Maynard (1975) and Maxwell (1981), for example, both compare health care systems, but are largely descriptive and seem to have been motivated mainly out of efficiency considerations (see e.g. Maynard, 1975, p. 267). Studies along the lines of that of Newhouse (1976) and Parkin *et al.* (1987) also compare health care systems, but aim at explaining international variations in expenditure. The second difference is that the EC study employs micro-level data, whereas previous empirical studies of a comparative nature have

almost all been based on aggregate data. This switch to the use of micro-level data in international comparisons has already occurred elsewhere in social policy analysis (Smeeding *et al.*, 1985; Atkinson, 1987). The third difference is that, in the EC study, the analysis for each country is being undertaken, for the most part, by citizens of the country in question. This contrasts with previous comparative studies in the health field where one researcher tends to perform the analysis for all the countries in the study (e.g. Abel Smith, 1984).

This paper outlines some of the methods currently being used in the EC study and presents some tentative cross-country comparisons using data from Britain, Italy, the Netherlands, and the United States. It examines equity in both the finance of health care and in its delivery.

In section II we explore the question 'What is equity', summarizing various important distinctions that have been made in the health economics literature regarding this *concept*. Section III considers the problem of *defining* equity. Section IV investigates the issue of *measuring* it. This is a topic that has received hardly any attention at all in the health economics literature but is clearly crucial if cross-country comparisons are to be performed. In section IV we outline some measurement methods that might be employed. We then employ these measures in section V to analyse equity in the finance and delivery of health care in our four countries. The final section contains a summary and a discussion.

II. WHAT IS EQUITY?

Equity, like efficiency, is a goal that is pursued by policy-makers in all types of health care systems (McLachlan and Maynard, 1982). There is, however, much less agreement over what constitutes equity than there is over what constitutes efficiency: as McLachlan and Maynard (*op. cit.*) note, '... equity, like beauty, is in the mind of the beholder...' (p. 520). Not all individuals subscribe to the same *concept* of equity: contrary to what is often suggested, for example, not everyone takes the view that equity is about equality. Moreover, distributional issues do not always concern equity:

³ The project forms one of several projects in the EC-COMAC Health Services Research programme. The ten countries include eight EC countries and two non-EC countries.

they may arise from feelings of compassion or altruism. This too is a distinction that is not generally appreciated: distributional goals and equity goals are typically viewed as one and the same. In this section we examine the principal concepts of equity and consider the extent to which support for each varies across countries. We begin, however, with the distinction between distributional goals that derive from equity considerations and those that do not.

(i) Equity versus Altruism

Distributional objectives in health care, and in social policy generally, can arise from two sources. First, they can arise from considerations of social justice and fairness (i.e. equity). In other words an equitable distribution of health care would be one that is considered to be fair or just. Alternatively, distributional objectives can arise from feelings of altruism or caring. The concepts of equity and altruism are often confused.⁴ Equity and altruism are, however, as Culyer (1980) and Goodin and Le Grand (1987) emphasize, quite distinct and have quite different implications for health policy.⁵

Caring and altruism are matters of *preference*. In the context of health care a caring individual might be one who derives utility—i.e. an external benefit—from seeing another person receiving health care (Culyer, 1980). In this case the caring individual *prefers* that the person in question receives health care and is prepared to sacrifice resources to ensure that the person actually obtains treatment. Quite how much he is prepared to sacrifice will depend on how much he cares (which will depend on *inter alia* his income) and on the cost of providing health care. Alternatively a caring individual might be one that derives utility from the *act* of providing health care for others (Mooney, 1986). Quite how much of his income the individual will be prepared to sacrifice to provide health care for others will depend on the utility he derives from the act of providing medical care (which again will depend on his income) and on the cost of providing health care.

With caring preferences of either type, therefore, ‘costs and benefits are balanced at the margin and . . . the level of provision is . . . determined by the wealth of the community’ (Culyer, 1980, p. 70). The language of caring is thus the language of efficiency. Hence the term ‘Pareto optimal redistribution’ (Hochman and Rodgers, 1969).

Social justice or equity, on the other hand, is not a matter of individual preference. In the words of Culyer (op. cit.):

. . . the source of value for making judgements about equity lies outside, or is extrinsic to, preferences. . . . The whole point of making a judgement about justice is so to frame it that it is (and can be seen to be) a judgement made independently of the interests of the individual making it. (p. 60.)

Social justice thus derives from a set of principles concerning what a person ought to have *as of right*. The different motivations behind equity and caring have at least two important implications for health care policy. First, decisions regarding health care provision prompted by considerations of social justice ought not to be influenced by cost: justice requires that an equitable pattern of provision be ensured, irrespective of the cost to the rest of society (Culyer, 1980, pp. 69–70). Second, there is scope for conflict between efficiency and equity: an efficient redistributive programme prompted by caring preferences need not be equitable, and vice versa (Culyer, 1980, p. 98).

For some purposes it may not be important to be able to separate out considerations of equity from considerations of altruism. One might be content to analyse the extent to which society’s stated distributional goals—however motivated—are being achieved. This strategy is explicitly adopted by Le Grand (1982) and Goodin and Le Grand (1987). In the light of the discussion above, though, this is not altogether satisfactory. Ideally, one would like to analyse equity objectives independently of distributional objectives that are motivated by altruism. That there is so much talk of equity

⁴ Mooney (1986), for example, asks whether one can rationalize the equity goals of the NHS in terms of altruism. To the extent that the NHS’s equity goals are genuinely about equity and social justice rather than altruism, the question would seem somewhat misguided. Of course, it may be that what are passed off as equity objectives are really not equity objectives at all, but rather are redistributive objectives reflecting altruism. It is not obvious, however, that it makes sense to assume that this is the case *ex hypothesis*.

⁵ This section draws heavily on Culyer (1980).

objectives in the context of health care suggests either that a separate analysis of equity is held to be desirable, or that the distinction between altruism and equity is not widely appreciated.

(ii) Social Justice and Concepts of Equity

There is another important but often overlooked distinction in the literature, namely the distinction between equity objectives that are couched in terms of *equality* and those that are couched in terms of *minimum standards* (Le Grand and Robinson, 1984, p. 37).⁶ Policies whose objectives are couched in terms of equality aim at eliminating inequalities; policies whose objectives are couched in terms of minimum standards aim merely at ensuring that nobody falls below some specified minimum level.

Equity goals couched in terms of *equality* may be viewed as coming from a theory of social justice built around the notion of *distribution according to need* (Culyer, 1980, p. 62). This in turn is a key component of 20th-century egalitarianism (Sugden, 1983). Egalitarians view

access to health care [as] a citizen's right . . . , which ought not to be influenced by income and wealth (Maynard and Williams, 1984, p. 96).

Egalitarians emphasize *fraternity*—a sense of brotherhood and collective citizenship between people (Sugden, op. cit.). They espouse an explicitly *collectivist* philosophy of social justice and view social unity as a good thing in its own right. This egalitarian view suggests that an NHS-type state sector should predominate in the health care sector, with health care being rationed according to 'need' (Maynard and Williams, op. cit.; Williams, 1988).

To an egalitarian an equitable health care financing system is one in which payments for health care are positively related to ability to pay: he would regard it as right and proper that persons who are able to pay more towards health care should do so. On the delivery side this viewpoint gives rise to a set of equity objectives that are couched in terms of *equality*. One such goal is 'equal treatment for equal need'; another is 'equality of access' (see section III below). Both refer to equality rather than

to minimum standards (Goodin and Le Grand, 1987). All—or nearly all—inequalities are inequitable. An egalitarian would, for example, argue that

it is wholly wrong that, when two people are in equal need of medical care . . . , one should receive more than the other (Sugden, 1983, p. 37).

Sugden, in fact, goes further and argues that unequal treatment of persons in equal need would be viewed as inequitable, *even if the inequality arises out of the free choice of the individuals concerned*; even if, for example, one of the persons had voluntarily chosen not to take out health insurance. Thus:

Once it is accepted that social unity is a good thing in its own right, and a 'sense of separateness' is bad, it becomes natural to say that people in like circumstances ought to consume the same combinations of goods and services whether they would chose to do so or not. (Sugden, 1983, p. 41)

This view is hotly disputed by Le Grand (1987b), who argues that, depending on circumstances, there may be instances where equal treatment for equal need would 'conflict with intuitive judgements' (Le Grand, 1984, p. 44). He gives the example of a drunk driver crashing his car and injuring himself and a pedestrian in the process, and suggests that equity would require giving the victim preference. One cannot, Le Grand concludes,

simply observe inequality . . . and thereby judge, *on the basis of that inequality alone*, whether or not an allocation is equitable or inequitable (Le Grand, 1984, p. 44; emphasis in original).

Whether a true egalitarian would accept this or not is, perhaps, a moot point. In its emphasis on individual circumstances and its suggestion that some individuals are more deserving than others, Le Grand's ideas would seem to run counter to the egalitarian emphasis on fraternity and common citizenship. An egalitarian might argue that there is no space in his philosophy for what are essentially *individualistic* 'intuitive judgements'.

A second set of equity goals is defined in terms of *minimum standards* (Le Grand and Robinson, 1984). Culyer (1980) suggests that an emphasis on minimum

⁶ The distinction between equality and minimum standards is made in both the literature on caring *and* the literature on equity and social justice (Culyer, 1980). The rationale for each could therefore be sought either in terms of altruism or in terms of considerations of social justice. Here we focus on the latter.

standards might be viewed as the outcome of a Rawlsian conceptual experiment in which ‘all would come to the same conclusion behind the “veil of ignorance” that certain minima . . . ought to be guaranteed each member of society’ (Culyer, 1980, p. 146). In the context of health care the emphasis on minimum standards is particularly prevalent amongst what Maynard and Williams (op. cit.) call the ‘libertarian’ school. This regards access to health care as part of society’s reward system and maintains that people should, at the margin at least, ‘be permitted to use their income and wealth to gain more or better health care (than their fellow citizens in otherwise identical circumstances) if they so desire’ (Maynard and Williams, 1984, p. 96). This reflects the fundamentally *individualistic* nature of the libertarian viewpoint:

To anyone whose values are individualistic, it is natural that social arrangements should reflect the diversity of people’s interests and preferences. That different people should consume different bundles of goods and services is entirely right and proper. (Sugden, 1983, p. 41.)

The libertarian approach points, as Maynard and Williams note, towards a mainly private health care sector, with health care being rationed primarily according to willingness and ability to pay. It requires that state involvement be minimal and limited to providing a minimum standard of care for the poor.

According to this viewpoint, on the delivery side, considerations of social justice require that everybody be guaranteed a basic minimum level of health care. On the *finance* side, there should be income transfers from the non-poor to the poor, but these should be *in-kind* transfers in the form of free or subsidized health care. Nothing is indicated about how the burden of financing the transfers should be distributed across the non-poor.

(iii) Cross-Country Differences in Equity Goals

The differences between countries in their health

care systems probably reflect, at least to some extent, the differences in the type of equity goals pursued.⁷ In the United States, equity goals tend to be defined in terms of minimum standards rather than in terms of equal treatment for equal need, or equality of access.⁸ In several of the European countries, by contrast, policy statements on equity frequently have a distinctly egalitarian flavour (e.g. British Ministry of Health, 1944).

The fact that not all countries subscribe to the same equity goals means that a country’s health care system can be appraised in either of two ways (Culyer *et al.*, 1982). One way would be to appraise it with reference to its own equity goals. This would be the relevant assessment if one were interested in answering the question: how successful is the country in question in achieving its own equity objectives? Alternatively, the country’s system might be appraised with reference to another country’s equity goals. This cross-cultural assessment would be relevant if one were interested in answering the question: does ‘their’ system do better than ‘ours’?

III. HOW SHOULD EQUITY BE DEFINED?

In the previous section we considered what are essentially *concepts* of equity. In this section we look at the various *definitions* of equity that have been proposed in the literature. In doing so we focus exclusively on *egalitarian* goals and ignore completely minimum standards goals. We also consider separately the finance of health care its delivery.

(i) Defining Equity in the Finance of Health Care

Egalitarians typically define equity on the finance side in terms of a requirement that payments for health care be directly related to ability to pay. In effect, this is a statement about *vertical equity*—the requirement that unequals (defined here in terms of

⁷ Such a conclusion may be unwarranted. As Maxwell (1981) notes, the mix between different sources of finance frequently seems to depend more on history than on principle. It may well be wrong, in other words, to assume that a particular mix represents the outcome of a deliberate and well-informed decision.

⁸ Tobin (1970) is rather ambivalent about attitudes in the United States towards health care. He suggests that Americans are concerned about inequality in access to medical care and that equality in health care might be taken to mean that ‘the treatment of an individual depends on his medical condition and symptoms, not on his ability or willingness to pay’. Later, however, he notes that in practice the American health care system aims at bringing the medical care received by the poor up to a minimum standard rather than at promoting equality of access.

'ability to pay') be treated unequally.⁹ As a definition it is rather vague. How is 'ability to pay' to be measured? By pre-tax income? By pre-tax income plus imputed income from physical assets such as the individual's house? Should those with greater ability to pay be paying more in proportional terms? In other words, ought the relationship between ability to pay and payments to be progressive?¹⁰ Or should they merely be paying more in absolute terms? In other words, can the relationship between ability to pay and payments be proportional or even regressive?¹¹ If the relationship is to be progressive, how progressive ought it to be? Typically policy statements fail to address questions such as these. It seems reasonable, however, to conclude that for an egalitarian, payments for health care ought not to be regressive and probably ought to be progressive.

The issue of *horizontal equity* on the finance side (the requirement that equals be treated equally) is rarely discussed by policy-makers and has received little attention in the health economics literature. The logic of the discussion above suggests that horizontal equity might be defined in terms of the extent to which those of equal ability to pay actually end up making equal payments, regardless of, for example, gender, marital status, trade union membership, place of residence, etc. Horizontal *inequity* might arise for a number of reasons. In a tax-funded system such as the British NHS it might arise through anomalies in the personal income tax system (e.g. tax reliefs such as mortgage interest tax relief). In a private insurance system low-risk groups (e.g. non-drinkers) may receive reduced premiums. A strict egalitarian might well consider this inequitable.¹² In a mixed system different occupational groups may be eligible for different health insurance schemes. Some examples of horizontal inequity in the Dutch health care financing system are provided by Rutten and Janssen (1987): they find, for example, that single persons on an income of Dfl 17,000 in 1981 could end up paying as little as

2 per cent of their income towards health care if they were over 65 but as much as 13 per cent if they were under 65 but self-employed.

(ii) Defining Equity in the Delivery of Health Care

Common to all egalitarian definitions of equity in the delivery of health care is the emphasis on *equality*. The various possible definitions have been discussed by Le Grand (1982, 1987b) and Mooney (1983, 1986). The three most common definitions are: (i) equal treatment for equal need, (ii) equality of access, and (iii) equality of health. Another definition that is implicit in some of the empirical work is: (iv) equality of final incomes. The idea here is that health care should be allocated in a way that favours the poor, so that inequalities in final incomes (i.e. income plus imputed benefits from health care) are reduced.¹³

There are various points that are worth noting before considering the relevance of each of these definitions. First, the concept of 'access' is often ill-defined in policy documents. Le Grand (1982) suggests that it might best be interpreted in terms of the time and money costs that individuals incur in using health care facilities. As Mooney (1983) emphasizes, this makes 'access' a supply-side phenomenon and contrasts with 'treatment', which is a function of both supply and demand: i.e. the latter depends not only on the costs facing an individual but also on his perception of the benefits of health care. Second, definitions (ii) and (iii) both view equity in terms of the attainment of equality *across the population as a whole*, whilst the first views equity in terms of the attainment of equality amongst *specific sub-groups in the population*, notably those in equal 'need' (Goodin and Le Grand, 1987). In the context of the latter it is important to note that the judgement about whether a person is in 'need' is to be made not by the

⁹ On the distinction between vertical and horizontal equity, see Cullis and West (1979) and West (1981).

¹⁰ A finance system is progressive if the proportion of income paid out for health care rises as the level of income rises.

¹¹ A finance system is proportional if the proportion of income paid out for health care is the same at all income levels and regressive if the proportion of income paid out falls as income rises.

¹² Le Grand (1987b) would presumably argue otherwise. The argument would be that individuals who choose to drink, knowing the risks involved to themselves and others (e.g. through drunk driving), should, on equity grounds, be called on to pay towards the cost of any treatment they or others require as a result of their drinking.

¹³ Mooney (1983) adds another definition, namely 'equal access for equal need'. This definition seems, in fact, to be at the heart of the resource allocation formula of the English Resource Allocation Working Party (cf. British Department of Health and Social Security, 1976).

individual but by a third party (usually the physician) (Williams, 1978, 1987). Third, all three definitions are difficult to operationalize. How should treatment be measured? By utilization or by imputed resource costs? On what criteria is need to be assessed? How should access be measured? How far can one blame inequalities in health on the health care system?

With definition (i) it is natural to go one step further and make the distinction between horizontal equity and vertical equity. As it stands definition (i) is a statement only about horizontal equity: it says nothing about how those in unequal need should be treated. Supplementing definition (i) with its vertical equity counterpart is, in principle, important, because horizontal equity does not guarantee vertical equity. In practice, however, operationalizing the concept of vertical equity is hampered by some major problems: these include determining what constitutes unequal need, determining the degree of inequality between those considered to be in different degrees of need, and deciding what form the unequal treatment of unequals should take (Le Grand, 1984; Mooney, 1986). With some exceptions (e.g. Cullis and West, 1979, pp. 237–39) the issue of vertical equity in the delivery of health care rarely gets discussed in the health economics literature.

In applied work it is definitions (i), (iii), and (iv) that are the most common. The extent to which the British NHS has been successful in achieving equal treatment for equal need has been analysed by Le Grand (1978), Collins and Klein (1980), and Hurst (1985).¹⁴ Le Grand and Rabin (1986) and Illsley and Le Grand (1987) present evidence on trends in inequalities in health in Britain, while Le Grand (1987a) compares inequalities in health in Britain with inequalities in health elsewhere. The British Central Statistical Office (CSO) regularly presents analyses of the extent to which the NHS and other parts of the Welfare State redistribute income (e.g. CSO, 1987). Income redistribution studies in the field of health care are more popular, though, in the German-speaking countries: Leu and Frey (1985), for example, present the results of a budget incidence study assessing the extent to which the Swiss health care system as a whole results in income redistribution.

Mooney and McGuire (1987) have examined various policy statements in Britain and conclude that the equity objectives of the NHS are best captured by definitions (i) and (ii). Mooney and McGuire note that, despite the extensive interest in inequalities in health in Britain (e.g. British Department of Health and Social Security, 1980), there is no evidence whatsoever that equality of health is, or ever has been, an objective of government policy. The same might be said of countries such as Italy: though the Italian National Health Service Act talks about the *protection* of health, there is no indication that *equality* of health is a policy goal (Italian Ministry of Justice, 1978). Nor, it might be added, is there any evidence that the equity goals of Britain and Italy are couched in terms of income redistribution. This suggests that budget incidence studies such as that of Leu and Frey (op. cit.) are of little relevance in the health care sector. It also casts doubt on the assertion of Lambert and Pfähler (1988) to the effect that '... equitable ... distributions of ... expenditure benefits are not the ultimate objective of government policy; they are rather employed as means to achieve desired distributional equity of postfisc income' (p. 179).

None of this is to say, of course, that the adoption by governments of definitions (i) and (ii) is sensible or consistent. Several authors have, indeed, suggested otherwise (e.g. Le Grand, 1987b; Mooney, 1987; Culyer, this issue). It may well be that one day governments will respond to these criticisms by redefining their equity objectives in health care. If this happens, researchers will clearly need to devise new methods for monitoring the success of health care systems in achieving equity objectives. In the meantime, in the absence of consensus and new methods, it would seem to make sense to continue with the existing definitions.

IV. HOW SHOULD EQUITY BE MEASURED?

In order to be able to perform international comparisons it is clearly necessary to have some means of *measuring* equity. In the remainder of the paper we discuss ways in which this might be done, focusing on specific aspects and definitions. On the

¹⁴ Collins and Klein (1980) claim to examine access. Their measure of access is whether or not the person in question contacted a primary care physician, which is clearly a measure of utilization rather than access.

finance side we look only at vertical equity and ignore the issue of horizontal equity. On the delivery side we focus on the definition of equal treatment for equal need but ignore its vertical equity counterpart.

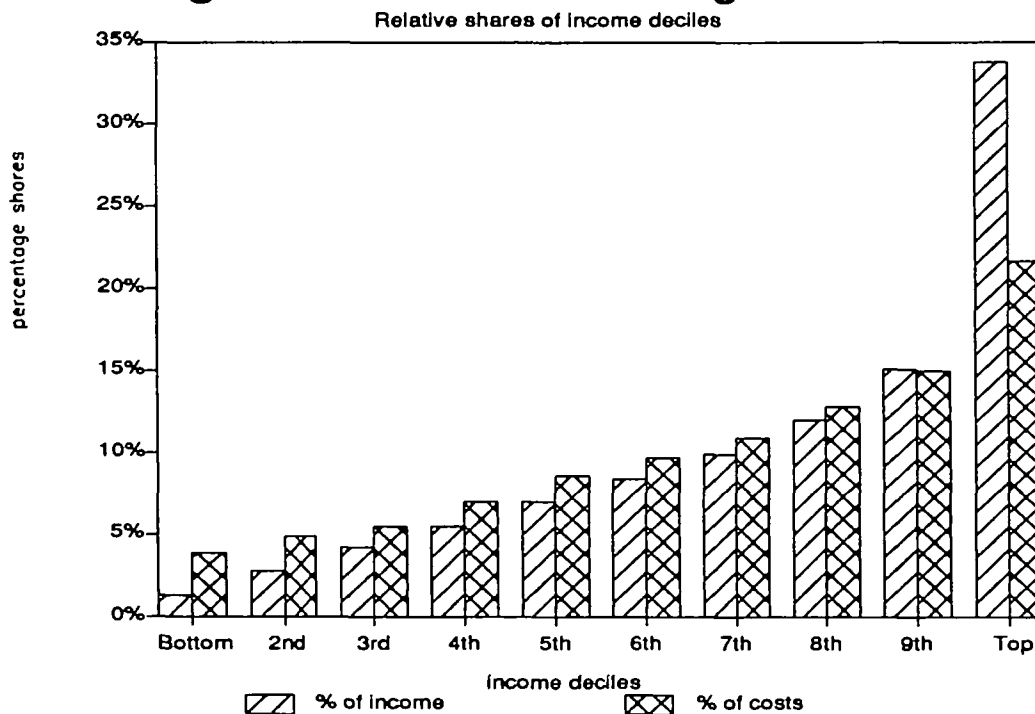
(i) Measuring Equity in the Finance of Health Care

In the absence of a clear statement on the desired relationship between ability to pay and payments, the obvious strategy to adopt in analysing vertical equity on the finance side is simply to describe the current relationship. Hurst (1985) does this in his comparison of the distribution of payments in Britain, Canada, and the United States: he presents tables indicating estimates of the average payment in each income group for each country and compares average payments with average incomes in the bottom and top income groups. He finds that the health care financing system is regressive in the USA, but progressive in Britain and Canada. Thus, for example, in Britain 'household income rises about 4.5 times between the second and ninth deciles whereas household tax contributions rose about seven-fold over this range' (Hurst, 1985, p. 117).

A similar approach was adopted by Gottschalk *et al.* (1986) in their comparison of the health care financing systems of the Netherlands, the United Kingdom, and the United States in 1981. They compare the percentage of (post-tax) income received by each decile with the percentage of total health care payments it bears. Figure 1 presents their results for the American system. Again, the results imply that the financing system in the United States is regressive. Thus, for example, the bottom income decile received 1.4 per cent of post-tax income but made 3.9 per cent of health care payments. The Dutch system is found to be roughly proportional and the British system progressive.

Tabulation of average incomes and health care payments by income group does not in itself enable one to answer the question of how much more (or less) progressive one system is than another. At best it can indicate whether a system is progressive, regressive, or proportional. A way round this problem is to employ *progressivity indices*. A variety of indices have been proposed in the literature on tax progressivity (e.g. Lambert, 1985) and these might be used to perform cross-country comparisons of the progressivity of health care financing systems.

Fig 1: Health care financing in U.S.



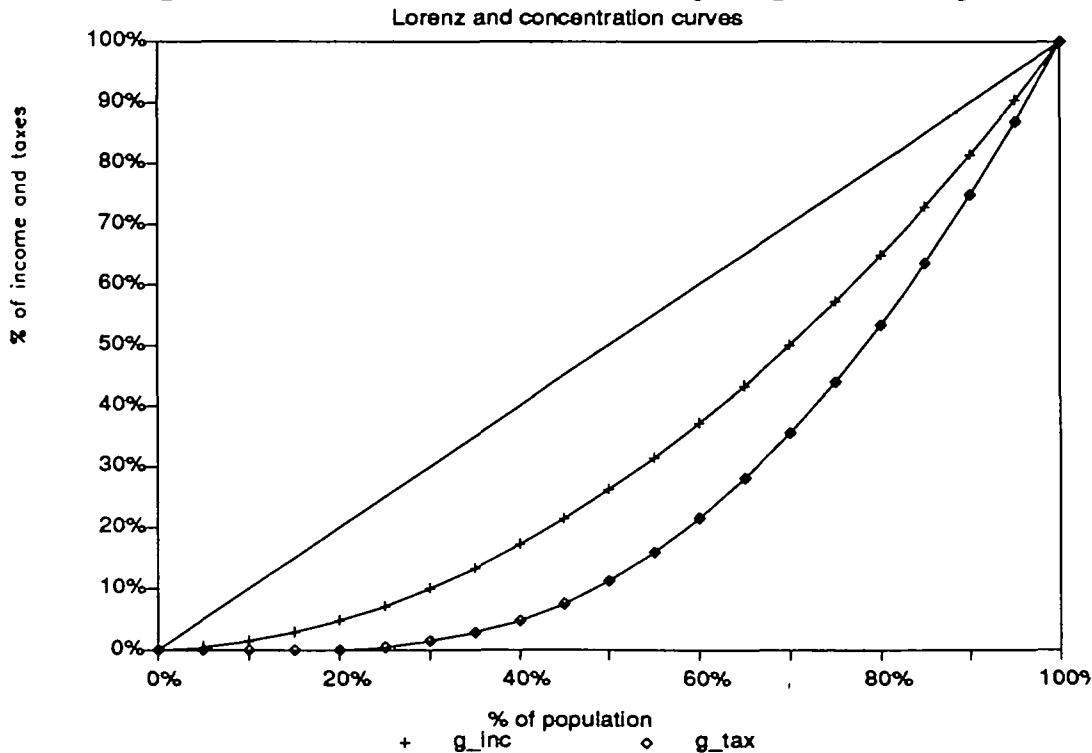
One popular index is the index proposed by Kakwani (1977). Kakwani's index is based on the extent to which a tax system departs from proportionality and can best be illustrated using Figure 2.¹⁵ The curve labelled g^{inc} gives the Lorenz curve for pre-tax income.¹⁶ The second curve—labelled g^{tax} —gives the *tax concentration curve*, which plots the cumulative proportions of the population (ranked according to pre-tax income as with g^{inc}) against the proportions of total tax payments. If taxes are levied strictly in proportion to income, the tax concentration curve and the Lorenz curve for pre-tax income would coincide. If the average tax rate rises with income (so that the tax system is progressive), the tax concentration curve lies outside the Lorenz curve for pre-tax income. The opposite is true if

taxes are regressive. The degree of progressivity might therefore be assessed by looking at the size of the area between g^{inc} and g^{tax} . If G^{inc} is the Gini coefficient for pre-tax income¹⁷ and C^{tax} is the concentration index for tax payments, Kakwani's index of progressivity, P^K , is defined as

$$(1) P^K = C^{tax} - G^{inc}$$

which is twice the area between g^{tax} and g^{inc} . If the system is regressive so that g^{tax} lies above g^{inc} , P^K is negative. The lowest value P^K can take is -2.0 . This occurs when all pre-tax income is concentrated in the hands of the richest person (so that the Lorenz curve is \perp -shaped) and the entire tax burden falls on the poorest person (so that the tax concentration

Fig 2: Measurement of tax progressivity



¹⁵ Not all indices of progressivity are based on the extent to which the tax system departs from proportionality. Some—such as that of Reynolds and Smolensky (1977)—are based on the redistributive effect of taxation (cf. Lambert, 1985).

¹⁶ The Lorenz curve plots cumulative proportions of the population (from the poorest to the richest) against the proportions of total income they receive. If incomes are distributed equally the Lorenz curve and the diagonal coincide. Otherwise it will be a bowed-out line as in Figure 2: thus, for example, the bottom 20 per cent of the population receive less than 20 per cent of the community's total income.

¹⁷ The Gini coefficient is the ellipse-shaped area between the Lorenz curve as a proportion of the total area under the diagonal. It is therefore equal to one minus the area under the Lorenz curve and ranges from 0 (when there is complete equality and the Lorenz curve coincides with the diagonal) to 1 (when all income is concentrated in the hands of one person and the Lorenz curve is \perp -shaped). The concentration index is defined in exactly the same way except that the concentration curve is used instead of the Lorenz curve.

curve is Γ -shaped). The highest value P^K can take is 1.0. This occurs when pre-tax income is distributed equally (so that the Lorenz curve coincides with the diagonal) and the entire tax burden falls on the richest person (so that the tax concentration curve is \perp -shaped).

(ii) Measuring Equity in the Delivery of Health Care

Under the definition given above (horizontal) equity in the delivery of health care requires that persons of equal need actually end up receiving equal treatment, irrespective of personal characteristics that are irrelevant to real need. The key 'third' variables here tend to be 'ability to pay', race, gender, and place of residence. We focus here on ability to pay.

In the British empirical literature 'ability to pay' is proxied either by income or by socio-economic status. 'Need' is proxied by self-reported health status and 'treatment' is measured either by utilization

(e.g. whether the individual had seen a general practitioner in the previous two weeks) or by imputed expenditure. The extent of inequity is then determined by comparing the distributions of need and treatment across income deciles or socioeconomic groups (SEGs).

Figure 3 presents the results for Le Grand's (1978) analysis of the 1972 *General Household Survey* data. The first pair of bars indicate that whilst 32 per cent of the 'ill' are to be found in SEGs V and VI (semi-skilled and unskilled manual workers), these SEGs together receive only 27 per cent of total expenditure. The final pair of bars indicates that whilst only 14 per cent of the 'ill' are to be found in SEGs I and II (professional, employers and managers), these two groups receive 17 per cent of total expenditure. By 'ill' is meant persons reporting either acute sickness or limiting long-standing illness. Expenditure comprises the imputed resource costs of utilization of primary care facilities and hospital in-patient and out-patient facilities. Note that the gap narrows as one moves from the first to

Fig 3: Distribution of health care

by SEG. England and Wales, 1972.

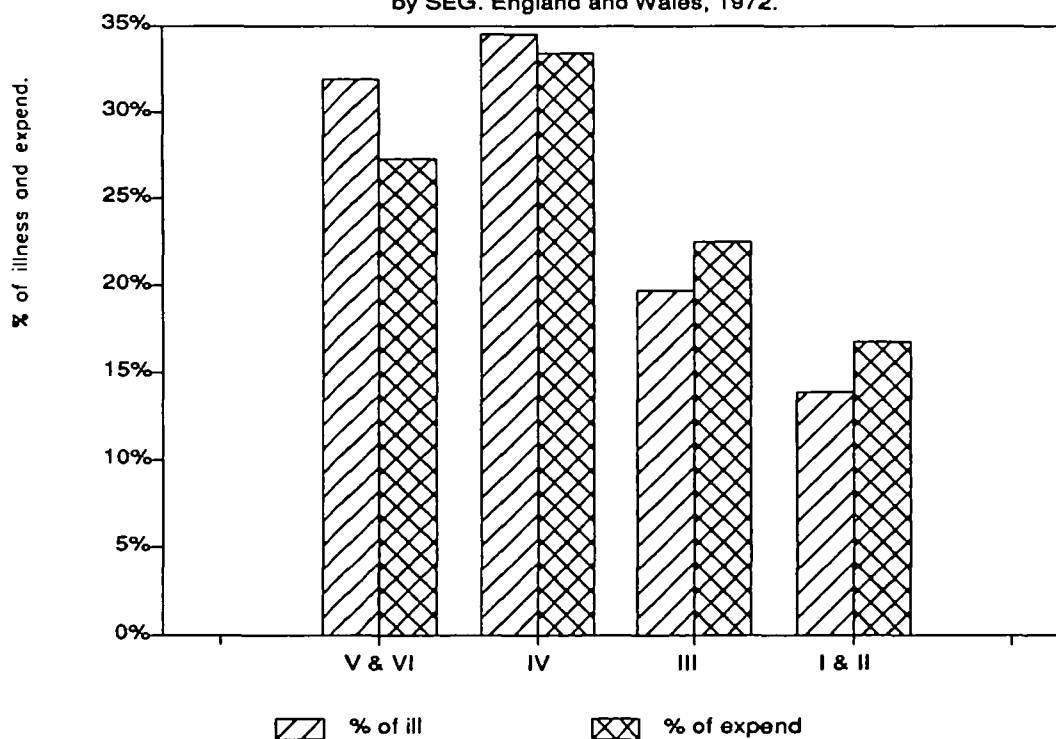
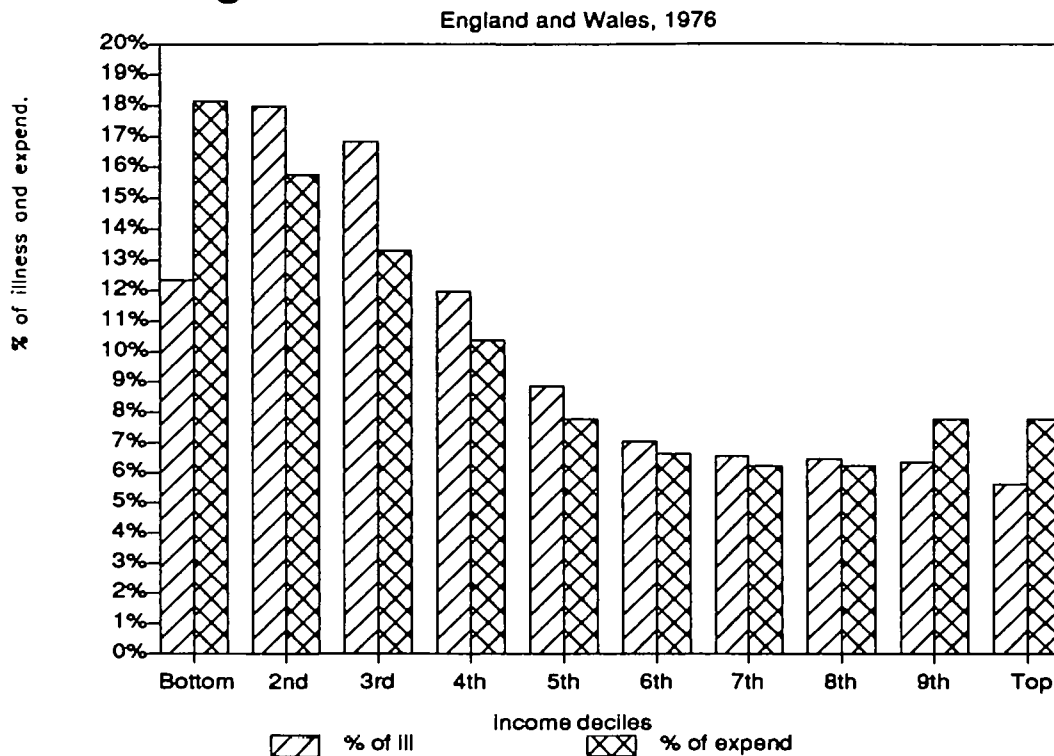


Fig 4: Distribution of health care

the second pair of bars and widens as one moves from the third to the fourth pair of bars. The implication of Figure 3 is that whilst the lower SEGs received a higher proportion of public expenditure on health care than the higher SEGs, their share was less than their share of reported sickness. Hurst (1985) has undertaken a similar analysis using the 1976 *General Household Survey* but based on income deciles. His results appear in Figure 4.¹⁸ From the third decile upwards the results are similar to those of Le Grand.

Le Grand (1982) concludes from his results that the NHS has failed to achieve equal treatment for equal need (Le Grand, 1982, p. 46). The argument is straightforward. Assume that all persons reporting ill are in equal need and that only persons who are ill receive health care. Then if horizontal equity is achieved—so that those in equal need receive the same amount of public expenditure—the share of NHS expenditure going to each SEG will be proportional to its share of persons reporting ill. If, as seems to be the case, the share of NHS expenditure received by the lower SEGs is *less* than their share

of persons reporting ill, it must be concluded that the sick in the lower SEGs receive less NHS expenditure than the sick in the higher SEGs. Equals are not being treated equally and—contrary to the aims of the founding fathers of the NHS—this inequity is apparently related to income.

As already mentioned, this argument assumes that all persons who are classified as ill are in equal need and that those who are not classified as ill do not make any use of the health service. As Puffer (1986) notes, if a person is classified as ill if he reports chronic *or* acute conditions (as in Le Grand's analysis but not in Hurst's), the first assumption is clearly unwarranted: the two groups are most unlikely to be regarded as requiring the same amounts of health care resources. In this case the argument above concerning horizontal equity breaks down. Trying to get round this problem by classifying people as ill if they are, say, chronically sick (as Hurst does) exacerbates the second problem: the fewer people one classifies as ill, the more people one leaves as non-sick and the less likely it is that the distribution of expenditure reflects what is received by those

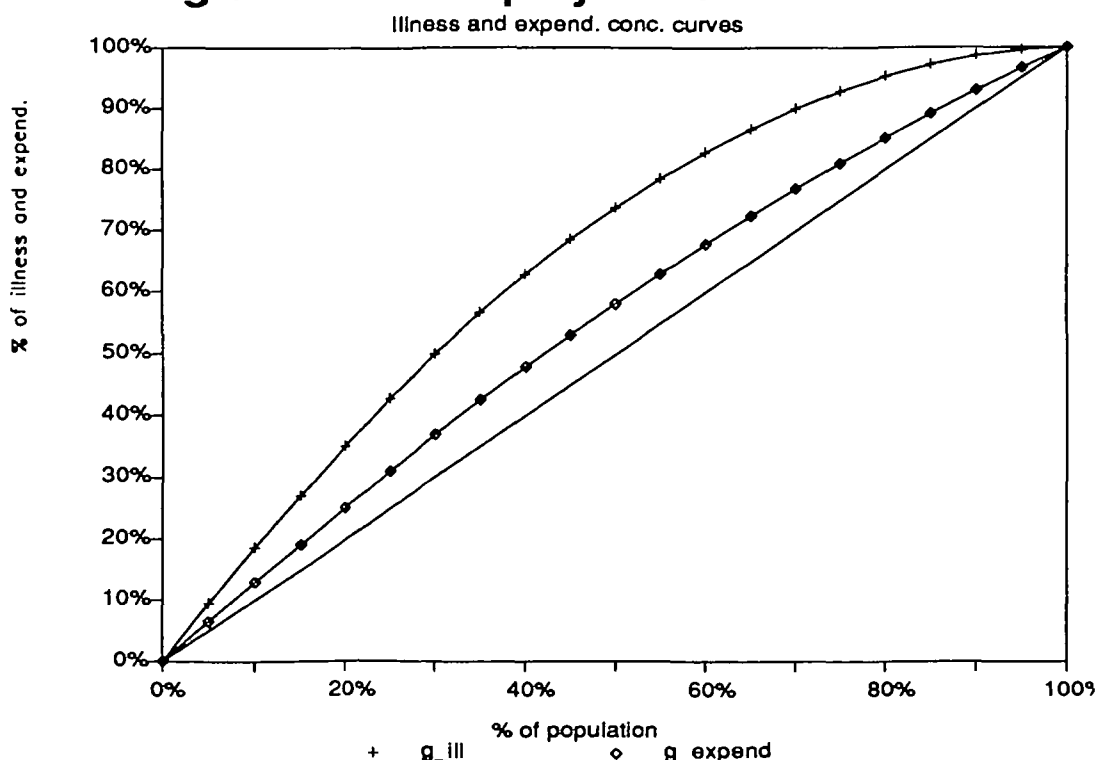
¹⁸ Expenditure figures are derived from Hurst's fig. 7.4 and are therefore subject to some error.

classified as ill. A way round both problems would be to break the sample down into groups with similar needs and then analyse for each sub-sample the distributions of illness and expenditure. The expenditure shares here would be the shares not of the total expenditure received by the sample but of the total expenditure received by the group in question. This approach has been used by Collins and Klein (1980) and O'Donnell (1987). Though it is hoped to make some use of this alternative approach in future work, the present paper sticks to Le Grand's original approach.

Bearing these shortcomings in mind we turn now to the problem of measuring inequity. As they stand, Figures 3 and 4 do not enable one to perform comparisons of the degree of equity of different delivery systems. At best they can show whether inequity exists. The discussion does, however, suggest a method for performing such comparisons. Le Grand's strategy involves determining whether the shares of expenditure received by the various SEGs (or income deciles) are proportional to their share of total ill-health: inequity favouring the rich results in the higher SEGs receiving more than their 'fair' share and the lower SEGs receiving less than their 'fair' share.

The extent of such inequity might be measured as follows. First, rank individuals according to their 'ability to pay', beginning with the poorest. Then construct an *illness concentration curve*: this is the curve labelled g^m in Figure 5 and plots the cumulative proportions of the population against the proportions of total ill-health. Note that because illness is concentrated amongst the lower income groups, the illness concentration curve lies above the diagonal: thus in Figure 5 persons in the bottom 40 per cent of the income distribution account for more than 40 per cent of all persons reporting ill health. It is important to appreciate that in constructing the curve labelled g^m persons are ranked by their income. This distinguishes our concentration curve from the Lorenz curve used by *inter alia* Illsley and Le Grand (1987): in this latter approach persons are ranked by their health rather than by their income. It is perhaps worth noting that the concentration curve would seem to be more suited to measuring inequalities in health than the Lorenz curve. The latter is open to the objection that it measures inequalities *per se* rather than inequalities associated with income—a shortcoming acknowledged by Illsley and Le Grand (1987, p. 33). The same criticism cannot, of course, be levelled at the concentration curve.

Fig 5: Horiz. inequity in health care



Next plot an *expenditure concentration curve*: this is the curve labelled g^{*p} in Figure 5 and plots the cumulative proportions of the population against the proportions of total expenditure received.¹⁹ Note that in so far as the lower income groups are more intensive users of health services than the higher income groups (as is the case in Britain), the expenditure concentration curve lies above the diagonal. Comparison of the two concentration curves provides an indication of the extent of inequity. If health care expenditures are allocated across income groups in proportion to their share of total ill-health, the two concentration curves would coincide. If those in lower income groups receive less than their 'fair' share and those in higher income groups receive more than their 'fair' share, the expenditure concentration curve will lie below the illness concentration curve.²⁰ The extent of inequity might therefore be assessed by looking at the size of the area between the two concentration curves. Following the logic of Kakwani's tax progressivity index, one might measure the extent of inequity as twice the area between the two curves. If C^i is the concentration coefficient for illness and C^{*p} is the concentration index for expenditures, twice the area between the two concentration curves is equal to²¹

$$(2) HI^{LO} = C^{*p} - C^i$$

The HI^{LO} index is positive if there is horizontal inequity favouring the rich and negative if there is horizontal inequity favouring the poor.²²

V. SOME ILLUSTRATIVE CROSS-COUNTRY COMPARISONS

In this section we present some empirical illustrations of the equity measures proposed in the previous section.

(i) Equity in the Finance of Health Care

Most countries finance the bulk of their health care expenditures from one or more of four sources: (i) taxation, (ii) social insurance contributions, (iii) out-of-pocket payments, and (iv) private insurance premiums. The mix of sources varies considerably from one country to the next (Maynard, 1975; Maxwell, 1981; Abel Smith, 1984). Some idea of this variation can be gleaned from Table 1, though the data are rather old.

The United States stands out as the only country relying on out-of-pocket payments and private insurance premiums for the majority of its revenues: in 1975 these two sources together accounted for 57 per cent of total expenditures. In Europe the picture is markedly different, with taxation and social insurance contributions together typically accounting for around three-quarters of health care expenditures: the average for the European countries listed in Table 1 is 80 per cent. The relative importance of taxation and social insurance in Europe varies, however, from country to country. The Nordic countries, Britain, Ireland, and Portugal all rely heavily on taxation: in Britain, for example, social insurance contributions account for only about 5 per cent of health care revenues, whilst in Portugal the role of social insurance contributions was reduced over the period 1974–8 and was finally abolished in 1978 (Abel Smith, 1984, p. 113). The other European countries all rely heavily on (compulsory) social insurance contributions: this includes countries such as Germany and the Netherlands where contributions are paid to sickness funds, as well as countries such as Italy and Spain where contributions are paid to central government.

The distinction between the different sources of finance is important, because the distribution of contributions across income groups tends to vary

¹⁹ Morris and Preston (1986) use an expenditure concentration curve for social security benefits.

²⁰ The opposite will of course be true if the poor receive more than their fair share and the rich receive less than their fair share.

²¹ Note that the concentration indices are negative if the concentration curves lie above the diagonal.

²² It might be argued that whether inequity favours the rich or the poor is immaterial. If this is the view taken and the concentration curves do not cross, HI^{LO} might be defined instead as twice the absolute value of the difference between C^{*p} and C^i . If, however, the concentration curves cross (as, for example, in the case of Hurst's results), the formula for HI^{LO} in eq (2) would be invalid.

Table 1
Health care expenditures by source of finance, 1975

Country	General tax %	Social insurance %	Direct payment %	Private insurance %
Australia	62.7	1.7	21.1	13.8
Canada	66.3	9.1	19.5	2.5
France	7.0	69.0	19.6	3.0
W Germany	14.6	62.5	12.5	5.3
Italy	23.8	67.5	8.7	-
Netherlands	15.1	56.0	27.3	-
Sweden	78.5	13.1	8.4	0.0
Switzerland	41.7	24.8	33.5	-
UK	87.3	5.0	5.8	1.2
USA	31.0	11.7	27.1	25.6

Source: Maxwell (1981), table 4-1.

Note: Figures for direct payment for Italy, the Netherlands, and Switzerland include insurance premiums.

from one source to another. As Maxwell (1981) notes, social insurance systems tend to be less progressive than tax-financed systems. The precise degree of progressivity depends, however, on the details of the scheme. The tax-financed systems operating in the Scandinavian countries, for example, rely heavily on local income tax (which tends to be proportional rather than progressive), whilst the British tax-financed NHS draws its funds from general tax revenues (which, on conventional assumptions about the incidence of indirect taxes, tend to be mildly progressive). The estimated progressivity of the social insurance schemes will depend *inter alia* on the split between employee and employer contributions, the assumptions one makes about who bears the employer contribution and on the progressivity of the two sets of contribution schedules.

Our empirical analysis in this section covers three countries: the United States, Britain, and the Netherlands. We selected these countries partly

because the necessary data were readily available in tabulated form. We begin with the case of the United States. This offers an interesting polar case, because of the importance of private health insurance and out-of-pocket payments. Of the ten countries listed in Table 1 the United States raised proportionally more revenue through private insurance premiums and out-of-pocket payments than any other. Public involvement in health care is limited and is mainly directed at the two programmes, Medicaid and Medicare.²³ The former is financed out of federal and state general tax revenues, whilst the latter is financed out of general tax revenues, payroll taxes, premiums, and direct payments.

Table 2, which is based on Gottschalk et al (1986), indicates *inter alia* the proportion of total expenditures from each source of finance borne by each income decile in 1981.²⁴ The first column indicates each decile's share of total pre-tax income. Columns 2-5 indicate the proportions of total payments borne by each decile: thus the first row of the table indicates

²³ Medicaid covers certain groups on low incomes. Medicare covers persons over 65, persons on renal dialysis, and the permanently disabled. There are other subsidy programmes (for example, for war veterans), but these are much smaller. There are also 'tax expenditures' in the form of exemptions for certain categories of private expenditure: health insurance is often a fringe benefit which is exempt from taxation and co-payments and co-insurance (above a certain minimum) are also tax-deductible. See Gottschalk et al. (1986) for details.

²⁴ It would seem from the description of the financing system in Gottschalk et al. (1986) that column 2 ought to be *general* taxation rather than *income* taxation. Because indirect taxes tend to be less progressive than income tax (indirect taxes are, in fact, often regressive), the progressivity of the financing system will be overstated.

Table 2
Distribution of Health Care Payments in the US, 1981

	(1)	(2)	(3)	(4)	(5)	(6)
	Income		Health Care Payments			
Decile	Pretax income %	Income tax %	Payroll tax %	Direct payments %	Insurance premiums %	Total payments %
Bottom	1.3	0.2	0.6	8.9	2.6	3.9
2nd	2.8	0.8	1.5	10.3	4.1	4.9
3rd	4.2	2.0	3.7	8.8	6.0	5.5
4th	5.5	3.0	6.1	9.6	8.0	7.0
5th	7.0	4.9	8.9	9.5	10.3	8.6
6th	8.4	6.5	10.7	9.2	12.2	9.7
7th	9.9	8.7	12.6	9.3	13.4	10.9
8th	12.0	12.1	14.7	10.7	14.9	12.8
9th	15.1	17.4	18.1	11.7	14.9	15.0
Top	33.8	44.5	23.0	11.9	13.6	21.7
% total revenue		23.6	15.2	32.8	28.4	
Gini/Conc	0.43	0.58	0.39	0.04	0.23	0.28
Kakwani		0.15	-0.04	-0.39	-0.19	-0.15

Sources: Column 1: Pechman (1985) table 4–6; Columns 2–6: Gottschalk *et al.* (1986), table 3.

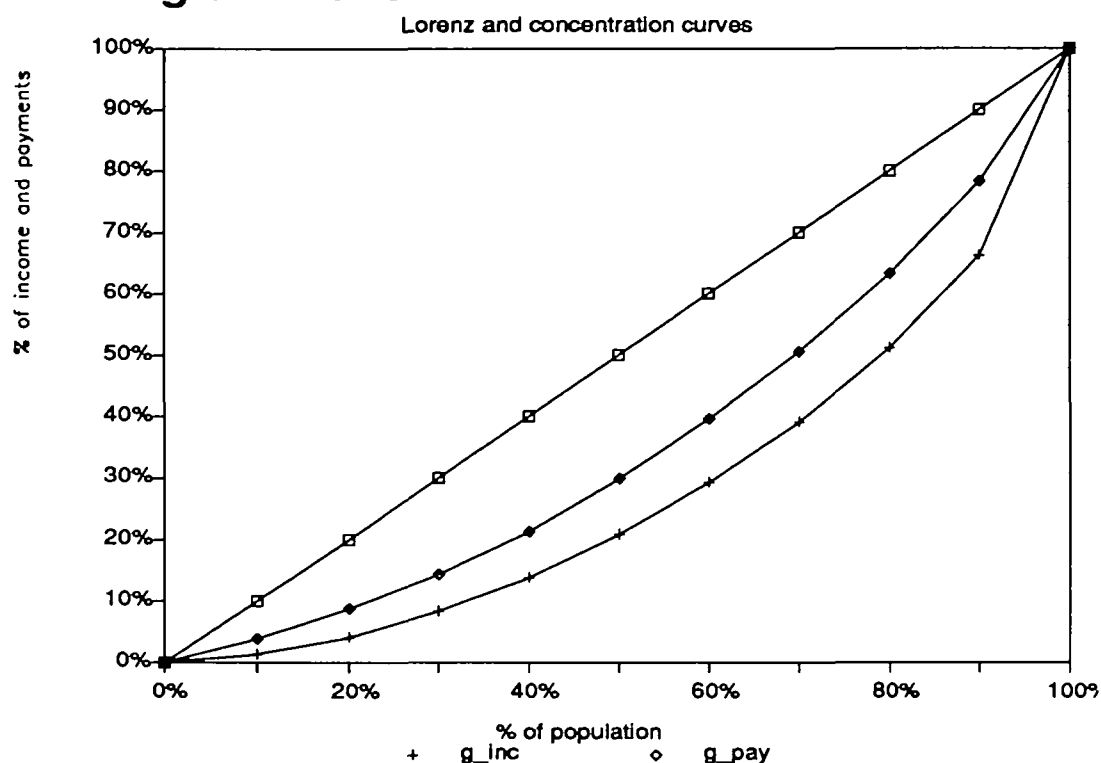
that the bottom income decile contributed a total of 0.20 per cent of income tax revenues, 0.61 per cent of payroll tax revenues, 8.91 per cent of revenues from direct payments and 2.61 per cent of revenues from insurance premiums. In the case of employer contributions to social insurance premiums (i.e. payroll taxes) and private insurance premiums it has been assumed that the burden is borne entirely by the employee in the form of lower wages. Also indicated in the table are the Gini coefficient for pre-tax income, the concentration coefficients for health care payments and the values of the Kakwani progressivity index.²⁵ The latter indicate that the income tax is progressive but that the other means of raising revenue are all regressive: out-of-pocket payments are particularly regressive. The overall

result is a regressive health care financing system. This is reflected in the fact that the payment concentration curve lies inside the Lorenz curve for pre-tax income (see Figure 6 below).

In Britain, despite the growth of the private sector in the late 1970s, the NHS still accounts for well over 90% of health care expenditure. As indicated in table 1, almost 90% of its revenues are derived from general taxation and only a small proportion from social insurance contributions. Out-of-pocket payments account only about 5% of NHS expenditures.

Table 3, which is also based on Gottschalk *et al.* (1986), indicates *inter alia* the proportion of each

²⁵ Throughout the paper the Gini coefficients and concentration indices are computed from the grouped data in the tables and are obtained by building up Lorenz and concentration curves using line segments (cf. e.g. Fuller and Lury, 1977). This approach in effect assumes that there is no inequality within each income range and therefore provides only the lower limit of the index in question (cf. e.g. Kakwani and Podder, 1976, p. 145).

Fig 6: Finance of health care in U.S.A.


source of finance for the NHS borne by each income decile in 1981. The first column indicates each decile's share of total pre-tax income.²⁶ The assumptions underlying the incidence of taxes are those employed by CSO (see e.g. CSO, 1987). As in the case of the United States, the burden of employer contributions to social insurance premiums (i.e. employer National Insurance contributions) has been assumed to fall entirely on the employee. Following Gottschalk *et al.*, the total payments column is based on a weighted average of columns 2 and 3, where the weights are equal to 0.9 and 0.1 respectively. Also indicated in the table are the Gini coefficient for pre-tax income, the concentration coefficients for health care payments and the values of the Kakwani progressivity index. The latter indicate that taxation is mildly progressive and that the National Insurance system is also mildly progressive. The overall result for the NHS is a progressive health care financing system. This is reflected in the fact that the payment concentration curve lies outside the Lorenz curve for pre-tax income (see Figure 7 below).

Health care in the Netherlands is financed mainly out of social and private insurance contributions, and direct payments. Only 6 per cent is financed out of general taxation. Social insurance contributions are of two types. The first type of contribution—the AWBZ contribution—is compulsory for all persons below pensionable age and covers expenses incurred in respect of 'catastrophic illness' (illness requiring long-term institutional care), out-patient mental care, and home nursing. AWBZ contributions are a fixed proportion of 'premium income', up to a ceiling and are paid by the employer. The second type of social insurance contribution is paid to sick funds to cover short-term care. These contributions are compulsory only for those with an income below a certain level. Prior to 1986, non-wage earners with an income below a certain level could contribute to a sick fund on a voluntary basis. Sick fund contributions are proportional to gross income up to a ceiling and are paid by employee and employer. Private insurance premiums are not income-related, but are instead often risk-related (for example, according to age). Persons with private

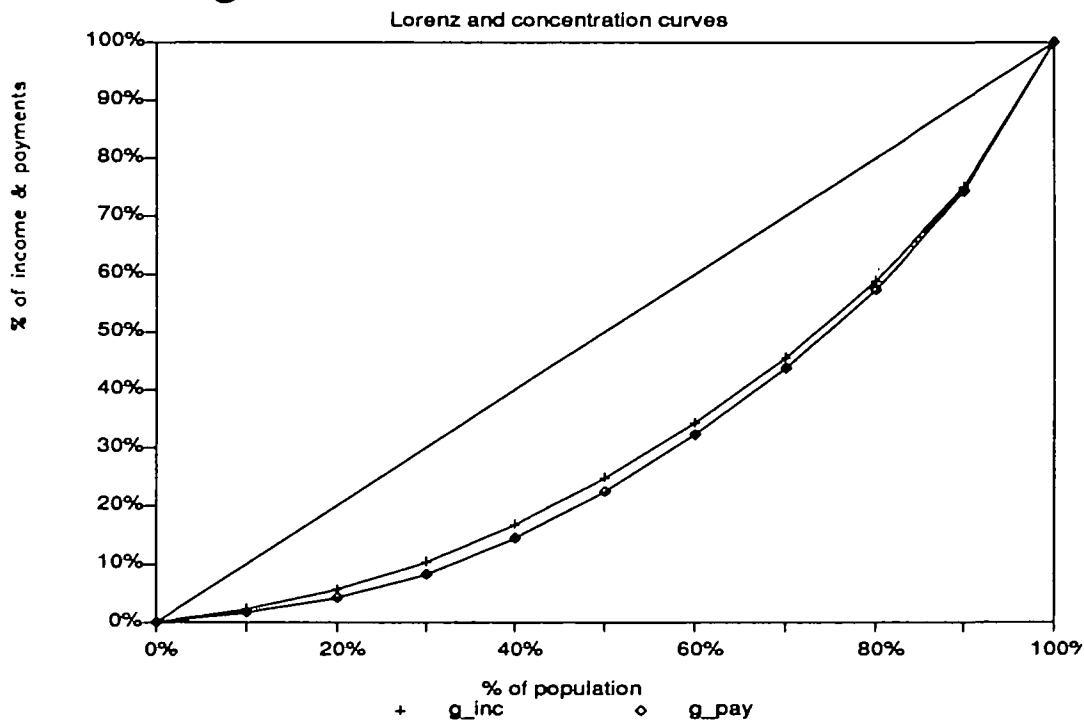
²⁶ Households are ranked by pre-tax income in all columns in table 3.

Table 3
Distribution of Health Care Payments in the UK, 1981

	(1)	(2)	(3)	(4)
Decile	Income	Health Care Payments		
	Pre-tax income %	Tax revenues %	Social insurance %	Total payments %
Bottom	2.3	1.7	1.3	1.7
2nd	3.4	2.6	1.9	2.5
3rd	4.7	4.1	3.4	4.0
4th	6.4	6.2	6.3	6.2
5th	8.0	7.9	8.5	7.9
6th	9.5	9.7	10.6	9.8
7th	11.2	11.4	12.5	11.5
8th	13.4	13.4	14.8	13.5
9th	16.2	17.0	17.6	17.1
Top	24.9	25.9	23.0	25.6
% total revenue		90.0	10.0	
Gini/Conc	0.35	0.38	0.38	0.38
Kakwani		0.02	0.03	0.03

Sources: Columns 1–3: CSO (1982), table 7; Column 4: 90 per cent from col. 2, 10 per cent from col. 3.

Fig 7: Health care finance in U.K.



insurance can often elect to be covered only for certain types of care and/or to bear some fixed amount of treatment costs via deductibles.

Table 4, which is based on tables from the *Household Expenditure Survey* of the Dutch Central Bureau of Statistics (CBS), indicates *inter alia* the proportion of total expenditures from each source of finance borne by each income decile in 1984.²⁷ Unfortunately we have been unable to break down insurance premiums (column 2) into sick fund contributions and private insurance premiums. It should also be noted that the estimates of the AWBZ contributions in Table 4 are very approximate.²⁸ It is evident from

the bottom line of the table that the two biggest components of the health care financing system (the sick fund contributions and the private insurance premiums) are both regressive. Interestingly the direct payments component of the financing system is quite progressive: this presumably reflects the fact that persons in high-income groups relying on private insurance often elect to cover themselves only partially and/or to reduce their premiums by accepting deductibles. The overall effect, however, is a regressive health care financing system. This means that in the case of the Netherlands, as for the United States, the payment concentration curve lies inside the Lorenz curve for pre-tax income. A

Table 4
Distribution of Health Care Payments in the Netherlands, 1984

	(1)	(2)	(3)	(4)	(5)
	Income		Health Care Payments		
Income decile	Pre-tax income %	Insurance premiums %	AWBZ premiums %	Direct payments %	Total payments %
Bottom	3.3	3.8	1.5	1.8	3.0
2nd	4.9	6.0	3.7	2.4	5.1
3rd	6.2	8.0	5.9	4.3	7.2
4th	7.3	9.0	7.9	3.2	8.5
5th	8.3	9.6	9.5	7.0	9.5
6th	9.3	10.8	10.8	7.8	10.7
7th	10.7	11.4	12.3	12.5	11.7
8th	12.3	11.9	14.2	18.6	12.8
9th	14.9	14.2	16.0	18.8	14.9
Top	22.7	15.3	18.1	23.5	16.5
% total revenue		75.8	31.2	3.7	
Gini/Conc	0.29	0.19	0.29	0.41	0.23
Kakwani		-0.10	0.00	0.12	-0.06

Source: All except AWBZ premiums from *Household Expenditure Survey*, 1984. AWBZ premiums from CBS *Personal Income Distribution in 1983: Households*.

Notes: 1. Premiums include Sick Fund and private health insurance premiums.

2. AWBZ premiums: compulsory social insurance against catastrophic illness.

²⁷ Gottschalk *et al.* (1986), in their analysis of the Dutch financing system, use tables from the *Health Interview Survey*. We prefer the *Household Expenditure Survey* for three reasons: (i) it contains more reliable estimates of health care expenditures (direct payments, and sick fund and private insurance premiums combined); (ii) it indicates average gross income for each of decile of net income, whereas tables from the *Health Interview Survey* only indicate net income; (iii) the *Household Expenditure Survey* does not treat all persons over 18 as a separate household, so that one does not run into the problem that the bottom decile (which includes a lot of student 'households') receives only a tiny proportion of income (c.f. fn. to table 7 of Gottschalk *et al.*, 1986).

²⁸ The published tables of the *Household Expenditure Survey* do not allow one to separate the sick fund contributions from the AWBZ contributions. The AWBZ data in the table were estimated especially for us by the Department of Income Statistics of CBS.

comparison of the Kakwani indices in Tables 2 and 4 reveals, however, that the American financing system is more regressive than the Dutch.

(ii) Equity in the Delivery of Health Care

As is evident from the results of the previous section, the overall progressivity of any health care financing system depends on the mix of sources of finance and the rules relating contributions to income. On the delivery side the degree of inequity depends on the extent to which a person's income (or ability to pay) influences the probability of his seeking care when ill and the amount of care he receives once the initial contact has been made. The influence of income is likely to be greater the larger are the various pecuniary and non-pecuniary costs individuals incur in utilizing medical care. Examples include insurance premiums, out-of-pocket payments, transport costs, and the opportunity cost of time spent travelling and waiting (Le Grand, 1982). Since these costs will tend to vary from one delivery system to the next, one would expect the degree of inequity to vary accordingly.

In this section we present some evidence on the extent of inequity in the delivery of health care in three countries: Italy, the Netherlands, and Britain. Again, our choice of countries was influenced by considerations of data availability. We begin with Britain.

Table 5, which is based on the data of Hurst (1985), indicates *inter alia* the distributions of illness and public expenditure on health care across income deciles. The data were derived from the 1976 *General Household Survey*, conducted by CSO. Income here is the *gross* income of the person's household. Individuals are classified as ill if they report limiting long-standing (i.e. chronic) sickness. The expenditure figure is derived from information on (i) the number of general practitioner consultations, (ii) the number of days in hospital, and (iii) the number of visits to hospital as an outpatient. Each category of utilization is weighted by its unit cost.

The first row of table 5 indicates that 12.3 per cent of persons reporting limiting long-standing illness are to be found in the bottom income decile, but the bottom income decile receives as much as 18.2 per cent of public expenditure on health care. The

second row indicates that 18.0 per cent of persons reporting limiting long-standing illness are to be found in the second income decile, but that this decile receives only 15.8 per cent of public expenditure on health care. The table also indicates the values of the concentration indices for illness and expenditure, as well as the index of horizontal equity (cf. equation (2) above). The concentration index for illness is negative indicating that persons in the lower income groups tend to be in poorer health than persons in the higher income groups. The concentration index for expenditure is also negative indicating that persons in the lower income groups tend to receive more health care than persons in the higher income groups. The index of inequity,

Table 5
Distribution of Health Care Expenditure
in England and Wales 1976

Income decile	% persons chronic illness	% of expenditure
Bottom	12.3	18.2
2nd	18.0	15.8
3rd	16.8	13.3
4th	12.0	10.4
5th	8.9	7.8
6th	7.0	6.6
7th	6.6	6.2
8th	6.5	6.2
9th	6.4	7.8
Top	5.6	7.8
Conc ind	-0.212	-0.198
HI	0.014	

Source: Hurst (1985)

however, is positive indicating that, on average, the expenditure concentration curve lies inside the illness concentration curve. The NHS is thus associated with horizontal inequity favouring the rich.

Table 6 presents similar data for the Netherlands. The data were derived from the *Health Interview Survey*, conducted by CBS. Income here is the *net* income of the individual's household. Two alternative health indicators were used: (i) the presence or absence of chronic conditions, and (ii) whether the

Table 6
Distribution of Health Care Expenditure in the Netherlands, 1981-5

Income range (Dfl 000)	% of population	% of expenditure	% persons chronic illness	% persons health not good
-18	17.7	27.7	22.4	27.3
18-22	14.7	18.6	17.4	20.2
22-28	21.5	18.7	21.5	21.9
28-36	18.2	15.4	15.8	14.0
36-45	14.2	9.3	11.8	8.9
45+	13.7	10.3	11.0	7.7
Conc index		-0.163	-0.095	-0.201
HI			-0.068	0.038

Source: Based on tabulations from *Health Interview Survey 1981-1985*

person viewed his health as being 'not so good' (*minder goed*). The expenditure figure is derived from information on (i) the number of general practitioner consultations, (ii) the number of specialist consultations, and (iii) the number of days in hospital. Again, each category is weighted by its unit cost.

The concentration index for chronic illness is negative as in Britain, indicating that inequalities in health exist in the Netherlands as well as in Britain. The absolute value of the index is, however, much smaller in the case of the Netherlands. Interpreted literally this means that there is less inequality in health in the Netherlands than in Britain. The bottom line of Table 6 indicates that though the index of horizontal inequity is positive in the case of the 'health not good' indicator, it is *negative* in the case of the chronic conditions indicator. Since it is the latter that comes closest to the indicator used by Hurst, the implication is that whilst the delivery of health care in Britain is associated with inequity favouring the rich, the delivery of health care in the Netherlands is associated with inequity favouring the poor. Thus in the case of the Nether-

lands the expenditure concentration curve lies *above* the concentration curve for chronic illness (see Figure 8).

Table 7 presents the distributions of illness and health care expenditure for Italy. The data were derived from the 1985 *Health Care Consumption Survey*, conducted by the Centro Europa Ricerche. Income here is the *gross* income of the respondent's family. As in the case of the Netherlands we use two alternative health indicators: (i) the presence or absence of chronic conditions, and (ii) whether the person viewed his health as being 'not good' (*non buono*). The expenditure figure is derived from information on (i) the number of physician consultations (general practitioners *and* specialists), and (ii) the number of spells in hospital.²⁹ Again both categories were weighted by their unit costs.³⁰

From the last-but-one line in Table 7 it is evident that inequalities in health between rich and poor exist in Italy as in our other two countries. However, comparing Tables 5, 6, and 7 reveals that inequalities in chronic ill-health seem to be less pronounced in

²⁹ Later we hope to produce more precise estimates of expenditure per person by distinguishing between visits to general practitioners and visits to specialists, and by using information on length of stay per hospital spell.

³⁰ For physician visits we have used a weighted average of the cost per GP visit and the cost per specialist visit, where the weights are the share of each type of visit in the total number of physician visits. Both costs are based on public sector costs. Our figure for cost per visit was Lire 31,077 (1985 prices). For hospitals we have used the cost per case for those private hospitals providing services to the state on a contractual basis (*ospedali convenzionati*): apparently it is impossible with the existing data collection system to compute cost per case for Italian state-owned hospitals. Our figure for cost per case was Lire 4,001,375 (1985 prices). Details of the calculations are available from the authors on request.

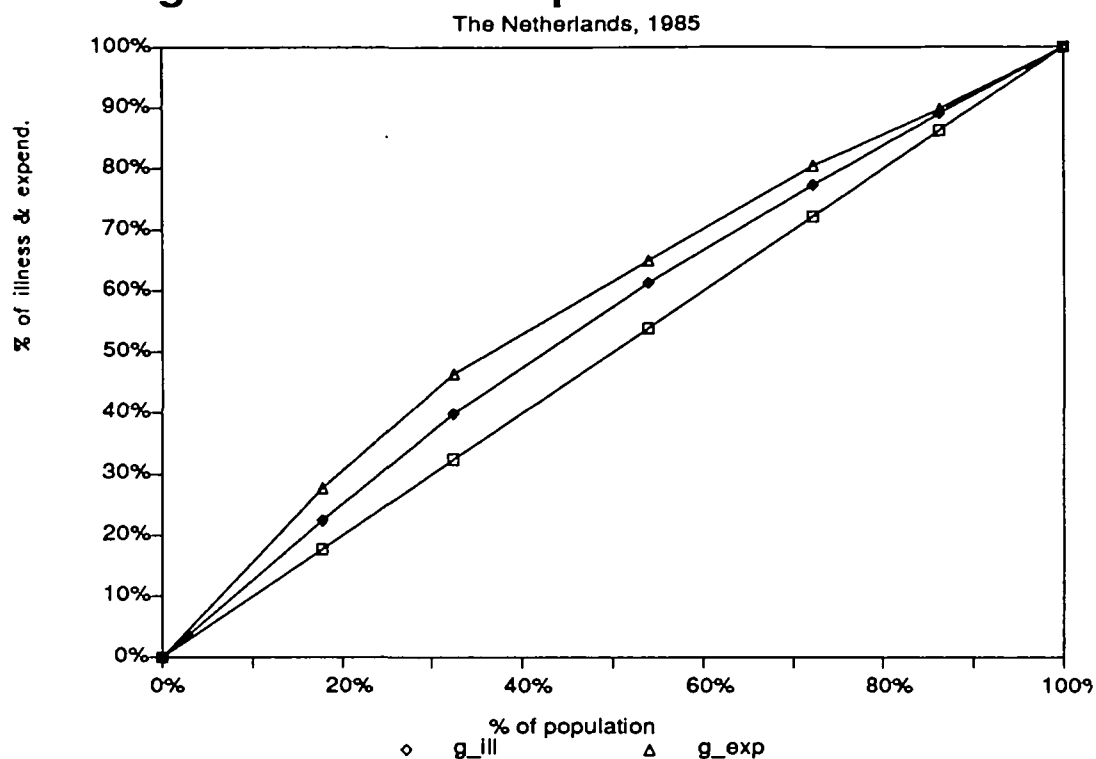
Fig 8: Illness and expend. conc. curves

Table 7
Distribution of Health Care Expenditure in Italy, 1985

Income range (Lire m.)	% of population	% of expenditure	% persons chronic illness	% persons health not good
-12	18.1	23.1	22.6	31.3
12-18	15.4	13.6	16.0	15.6
18-25	21.8	22.3	19.1	19.0
25-50	23.3	20.1	22.6	17.9
50+	21.4	20.9	19.8	16.2
Conc index		-0.047	-0.052	-0.165
HI			0.005	0.118

Source: Based on data from *Health Care Consumption Survey* conducted by Centro Europa Ricerche 1985.

Italy than they are in both Britain and the Netherlands. The ranking of Italy and the Netherlands is unchanged if the 'health not good' indicator is used instead. The indices of inequity provide a rather different picture. The index is positive for Italy for *both* health indicators, though in the case of the chronic illness indicator the index is close to zero and is substantially smaller than that of Britain. Thus though there is apparently some inequity favouring the rich, the degree of inequity is small both in absolute terms and relative to the degree of inequity present in Britain. It is worth noting that the indices of inequity in Tables 6 and 7 present a fairly consistent picture: the two indices for Italy are both larger than their Dutch counterparts (suggesting greater inequity in Italy than in the Netherlands), and the 'not good health' indicator presents a less favourable picture in both countries.

VI. DISCUSSION

Before summarizing and discussing what we *have* done, it may be worth pointing out what we have *not* done. First, we have looked only at egalitarian definitions of equity: we have said nothing about minimum standards definitions. For countries which do not aspire to egalitarian goals (such as the United States), this is an important omission. Second, in the measurement part of the paper we have looked only at vertical equity on the finance side: the issue of how to measure horizontal equity on the finance side was not discussed. Finally, in the measurement part of the paper we have looked only at one definition of (horizontal) equity on the delivery side: we have not discussed how, for example, the concept of equality of access might be operationalized.

Our results may be summarized as follows. Of the three countries whose financing systems we examined—the Netherlands, Britain, and the United States—two were found to have regressive financing systems (the Netherlands and the United States) and one a mildly progressive financing system (Britain). According to the index of progressivity used (the Kakwani index), the Dutch system was marginally less regressive than the American. Out-of-pocket payments were found to be particularly regressive in the United States, whilst in the Netherlands sick fund contributions and private insurance premiums combined were found to be

significantly regressive. Of the three countries whose health care delivery systems we looked at—Britain, Italy, and the Netherlands—two were found to exhibit inequity favouring the rich (Britain and Italy), though of the two Britain seemed less equitable. In the case of the Netherlands we discovered inequity favouring the rich only in the case of the 'health not good' health indicator: in the case of the chronic illness indicator the inequity favoured the poor. All three countries displayed inequalities in chronic ill-health. Of the three, Britain recorded the highest degree of inequality.

The implication of these results is that Britain tends to fare well in respect of equity in the finance of health care (at least in so far as progressivity is concerned) but badly in respect of equity in the delivery of health care. The opposite seems to be true of the Netherlands. Our results ought, however, to be interpreted with some caution, particularly on the delivery side.

One of the problems has already been touched on, namely the assumption implicit in our approach that it is only persons who are classified as ill who receive health care. There is, however, another difficulty that has not been mentioned. This is the possibility—discussed by Le Grand (1982)—that the results reported in Tables 5, 6, and 7 may be statistical artefacts. They may be caused simply by differences in the age and sex composition of the income deciles. It may well be the case, for example, that the expenditure concentration curve lies below the illness concentration curve in Italy and Britain because (i) age affects the amount of expenditure a person receives when they fall ill, and (ii) age and income are correlated. Suppose, for example, that the over-65s receive less treatment when ill than the under-65s and that the over-65s are concentrated in the bottom income decile. Then even if there is no inequity associated with income, the system will still appear to be inequitable, since the concentration of over-65s in the bottom income decile will mean that the share of health care expenditures received by this decile will be less than their share of ill-health. As a result, the expenditure concentration curve will lie below the illness concentration curve. This suggests that in order to be able to measure equity properly one really needs to take into account inter-group differences in demographic structure.

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