Utilities vs. Rights to Publicly Provided Goods: Arguments and Evidence from Health-Care Rationing

Paul Anand and Allan Wailoo
January 2000

NUMBER 14
Utilities vs. Rights to Publicly Provided Goods: Arguments and Evidence from Health-Care Rationing.

Economica forthcoming

Paul Anand - The Open University
Allan Wailoo - University of Leicester and The Open University

Dr Paul Anand
The Open University
Walton Hall
Milton Keynes MK7 6AA
Email: P.Anand@open.ac.uk
This paper challenges the QALY maximising approach to rationing health care on the grounds of consequentialist (and sometimes approximately utilitarian) moral framework on which it is based. An alternative methodological approach is suggested and, in addition to consequences, four normative determinants of health-care entitlements are identified: rights, public opinion, social contracts, and community values. Survey evidence is presented which shows support for these alternative frameworks and a rejection of consequentialism. The paper suggests that a (if not the) major challenge facing the designers of rationing guidelines is that of pluralism: i.e. the need to integrate considerations from a set of frameworks.

Introduction

In recent years the rationing debate has become one of the most salient in health services research. It is often claimed that an ageing population, coupled with technological advances, have combined to create cost pressures in health services to the extent that explicit rationing of services is inevitable. It is ironic that as changes in health care systems provide an opportunity for such explicit rationing, so moral philosophers, Korsgaard (1993) and Scheffler (1988), economic and social choice theorists, Sen (1979, 1985a) and Kolm (1994,1995), are dispensing with the utilitarian theory that underpins the economic tools for rationing.

The most conspicuous contribution of neo-classical economics to policy debate is the concept of the Quality Adjusted Life Year (QALY). This concept recognises that people value medical interventions for the benefits they bring both to length of life and quality of life. The QALY is thus a measure which incorporates both of these aspects of benefit. Whilst there have been criticisms of the QALY as a measure of health gain these considerations are excluded from the present discussion since our concern here is with the decision rule of QALY maximisation. Therefore, for our purposes, health maximisation will be assumed to be what the QALY maximisation rule attempts to formalise.

The proponents of QALYs have generally advocated that the aim of a rationing frame should be to maximise the total number generated, since this is in keeping with an economic interpretation of efficiency, Williams (1996), but there has been little examination of the relation to alternative normative frameworks, despite the fact that without such examinations it is often difficult to see whether objections help establish a coherent foundation for some alternative approach, or whether they merely identify conflicting goals that have, inevitably, to be traded off. In health economics the usual moral framework associated with QALY maximisation is utilitarianism though there is
some recognition that these terms are not coterminous, for example Wagstaff (1991) and also the discussion of evaluation foundations in Birch and Gafni (1992)3.

This paper looks at the problem of priority setting at a fairly high level of aggregation3. QALY maximisation as a method of allocating scarce health care resources at this level has met with mixed success on the policy side4 and some health economists have attempted to address this using contingent valuation. Methods such as willingness-to-pay (or accept) claim superiority over QALY maximisation as they are rooted in utilitarian economic theory, Donaldson (1993), and are therefore able to incorporate wider concerns than preferences for health outcomes5. Notwithstanding potential measurement problems in contingent valuation, Olsen (1997), NOAA Committee (1993), we draw on work on the economics of health care rationing but are concerned with its relations with the general critique of welfarism that has been discussed for some time by social choice theorists. The contingent valuation critique of QALY maximisation advocates more respect for actual preferences as evidenced by (hypothetical) willingness-to-pay values, while our concerns push in a different direction. Our argument will be that a defensible (normatively desirable) rationing system needs to incorporate claims from outside utilitarianism (and to anticipate, evidence presented in Table 5 suggests widespread rejection of various forms of utilitarianism).

We suggest that QALY maximisation has limited appeal because it is a consequentialist approach which has little to say about the multiplicity of rights that dominate the way in which medics, health ethicists and the public think about decision problems in this area; a characteristic it shares with utilitarianism. Furthermore, this may not be particular to health, as work on social choice theory by Sen (1979) argues. Indeed the issue currently lies at the heart of work on social choice theory and it is our hope that the kind of empirical work we present will contribute to the development of non-consequentialist social choice theory, Suzumura (1999)6. An understanding of the main categories of reasons for individuals rejecting the QALY maximisation rule will help health economists and social choice theorists alike. The paper does not assume that consequences of some sort (whether QALYs, utilities, or some other outcome) should be excluded from the determination of entitlements but it provides reasons and evidence for the bringing in, and integration of, other moral claims.

The structure of the paper is as follows. Section I presents three objections to the health maximisation approach whilst section II explores the potential role that alternative moral frameworks might play in grounding an explicit rationing system. A survey of voter preferences is used to test these theories with methods and results presented in section III. Concluding remarks are contained in section IV.

Objections to Health Maximisation

In this section, three objections to the health maximisation doctrine are discussed. The first concerns a generalised rationing problem in which the incorporation of QALY differences into the decision rule leads to allocations that entail potentially arbitrary exclusions from treatment. Objection number two revolves around a recent attempt to provide contractual grounding for health maximisation based on choice under a Rawlsian veil of ignorance while a third issue deals with questions of causation that are excluded from all consequentialist approaches. Sometimes such exclusions are of debatable
significance (e.g. cancer through smoking, discussed most recently by Persaud (1995)) but it will be shown that there are strong socio-demographic reasons why some elements of QALY differences should be eliminated from the determination of entitlements.

i) The arbitrary exclusion problem

Suppose society is divided into two mutually exclusive groups X and Y. Members of each group are affected by a disease (that could, but need not, be different for each group) which is fatal if not treated but otherwise completely treatable. All population members have the same life expectancy and differ only in terms of the age at which the disease strikes. Members of group X contract the disease with probability \( P_x \) at age \( a_x \). Corresponding facts hold for members of Y (see Table 1 below):

<table>
<thead>
<tr>
<th>TABLE 1  THE ARBITRARY EXCLUSION PROBLEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Group Size</td>
</tr>
<tr>
<td>Proportion Affected</td>
</tr>
<tr>
<td>Age at which disease strikes</td>
</tr>
</tbody>
</table>

Treatment for everyone costs one unit and is funded from a health care budget size \( B \). The budget is sufficiently constrained that it would not be possible to treat all patients in either group, i.e. \( B < \min(n_x, p_x, n_y, p_y) \). This simple but quite general account of the rationing problem helps us ask how the health care budget should be spent.

Health care maximisation makes a clear prescription and gives treatment to all those in the group where the disease strikes first, since a greater number of (quality adjusted) life years are generated. Whilst in principle those who hold deep health maximisation intuitions must favour such a choice even where \( |a_x - a_y| \) is small, perhaps only one year, it could be argued that in practice individuals may exhibit indifference between the groups for cognitive reasons.

However, where the affliction ages are wider, but still small, it seems reasonable to assume that health maximisation may be deemed unfair because members of one group (all 45 year olds for example) end up being excluded from treatment for reasons which seem somewhat arbitrary (40 year olds have priority). Even many of the ‘40 year olds’ might feel that a small age difference (hence a QALY difference) is not sufficient to entirely exclude one group from the opportunity of treatment, particularly in the extreme where treatment may be a matter of life and death. It is perfectly true that if a member of the 45 year old group struck had been a member of the 40 year old group, health maximisation would have preferred them so there is a sense in which health maximisation does provide equality of opportunity. However it is an equality that depends on the truth
of a counterfactual which seems only artificially relevant. For many people, the fair solution is one that gives an equal opportunity of treatment to those who are in need. In this case, that means the set of affected individuals who are in either category. People with these intuitions do not accept that being five years older is enough to exclude a person from being considered for treatment.

Those who hold that health maximisation is not appealing do not need to commit themselves to saying that the QALY measure is irrelevant in all rationing decisions where age plays a role, just that they reject the decision rule in which QALYs are counted equally regardless of where they are produced.

Without excluding other possibilities, one way to sum up objections to the health-maximisation position is to say that full recovery and the restoration of a complete life, is of equal value to each and every person treated regardless of whether they happen to be 40 years old or 45 years old. Furthermore, and this is the point, society wants to treat their entitlements to health care resources in a way that reflects this equality. Whilst it may be that utilitarianism in this situation would prescribe equal priority to both groups this is not necessarily the case and it is not therefore clear if health maximisation and utilitarianism stand, or fall, together. Shifting treatment between groups may increase the amount of ‘good’ done, to borrow the language from John Broome’s (1993) project, for example by gaining economically productive years. Given this interpretation utilitarianism would advocate treating the younger group as would health maximisation. However, it is difficult to imagine how such arbitrary exclusions would be avoided by alternative interpretations of utilitarianism. It is feasible that the preferences of those out with the immediate treatment decision, for example the families of potential treatment recipients, could determine entitlements with such a framework, even for an issue as personal as health care.

One method of allocating resources that reflects equality of entitlements is to create a pool of potential patients, size $n_xP_x + n_yP_y$ and to randomly select from within the pool until the budget constraint is satisfied. Each person in need would have a probability of being treated equal to $B/(n_xP_x + n_yP_y)$ irrespective of who they were (which group they belonged to). There are other possibilities: one might think the fair thing to do is to allocate resources equally between the groups and then to randomly select within each group. In this case, the probabilities of being treated conditional on being in need are $B/2n_xP_x$ and $B/2n_yP_y$. This proposal may, however, be less appealing than the first one: it could mean that members of a very large group are virtually excluded from access to treatment compared, say, with members of small groups and we shall return to the interpretation of such issues in section 2.

ii) Rational Egoism and the Problem of Uncertainty

The Rawlsian veil of ignorance is a technique much discussed in philosophy, economics and medical ethics, to assess justice in social institutions. This theory suggests that the course of action undertaken by rational egoists from the hypothetical position of not knowing their own position in society may be deemed just both in procedural and distributive terms.
Singer et al. (1995) support the cause of health maximisation using a veil of ignorance argument. Two examples are given to illustrate their case but we choose to concentrate on the second of these as the first deals with the concept of a 'stronger interest in continuing to live' which, in addition to being of questionable coherence, is compatible with utilitarianism rather than health maximisation\textsuperscript{12}. The problem they discuss is one in which two rational egoists must agree principles for allocating health care where both are in need of a heart transplant without which they will quickly die. However, one has a lower quality of life score due to a physical condition unrelated to the heart problem (this is not sufficient to give a negative quality of life score i.e. the individual still wants to go on living). In addition, we also assume (for sake of explicitness) that both individuals choose principles they would wish to prevail at the time the decision has to be made, that is that they are dynamically consistent.

From behind the veil of ignorance agents must decide between two positions. Position A is one in which there is a 50:50 chance of receiving the treatment and therefore living, regardless of your quality of life (H=High, L=Low). Position B is one in which you are treated and live with certainty (conditional on having the higher quality of life) or you die. According to Singer et al. (op cit.) voting for position B, consistent with QALY maximisation, will be chosen by the rational egoist since this gives an equal probability of dying as position A but if s/he lives it will be with a better quality of life. Our rebuttal of this argument depends on a claim similar to that levelled by Harsanyi in his critique of Rawls\textsuperscript{13}. For clarity the situation is summarised in figure 1.

After voting for A or B, nature determines first whether you are the high quality of life generator, and then, if you voted for A, whether you should be treated with a 0.5 probability. QALY-maximisation allocates treatment to the person capable of generating more utility and Singer et al claim this is what a rational egoist must choose. However at the decision node, a vote for B involves a choice of the outcome (utility) set \( \{1, 0\} \) over the set \( \{1, k, 0\} \). The choices are in fact equivalent under either maximin or maximax. If we apply insufficient reason and treat H and L as equally probable, the expected utility of B is 0.5 while the expected utility of A is \( 0.25 + 0.25k \) which by the inequality on k is less than 0.5. This is the result that Singer et al want but note that it depends on two assumptions which were implicit in their discussion of the setting: first they had to assume that the rational egoist applies insufficient reason and secondly that k is less than one. Neither assumption is necessary. Insufficient reason is unacceptable as a foundation for probability and only one of many possible and reasonable attitudes to ignorance. Further, it is highly questionable to argue that the utility of full recovery for a disabled person (or someone who just happened not to be very happy) is less than for anyone else. In any case, there is no reason in the economic theory of decision-making under partial ignorance to think that rational agents must follow insufficient reason and so we reject the generality of Singer et al's claim.
iii) The Relevance of Causes

Health maximisation is blind to causes. It matters not why or how a patient generates additional QALYs, just that they do. By contrast, frameworks that make allowance for causes in their evaluations of states cannot be consequentialist as they go beyond values of the states. There is at present a debate about the extent to which people engaged in risky activities should be eligible for publicly financed health care. In France, mountaineers pay for their own rescue services (via insurance) whilst in the UK, part of such rescues is often provided by voluntary contributions of time and money. Those who believe that the extent to which a person is responsible for their medical needs should influence their access to publicly funded health care cannot be consequentialists and a fortiori cannot be advocates of health care maximisation.

Our point about causation, however, goes beyond issues to do with personal responsibility. Recently there has been discussion of the fact that QALY estimates of drug efficacy based on traditional clinical trials (conducted on non-representative samples) may lead to biased estimates of value compared with those based on prescribed drug use with, say, an older population Balthussen et al (1996). In some contexts, the point is one that must surely be taken into account. However, in entitlement decisions there are, we suggest, situations in which QALY differences due to socio-demographic variables should be factored out rather than in\textsuperscript{14}.

Consider, for example, a situation in which treatments for stress-related conditions have been ranked according to the average QALY for three groups, each with a distinct socio-demographic mix. All health-maximisers need to know about the nature of the groups is summarised in the QALY data. However, imagine that we find out that the groups respectively comprise mainly the following: well-off businessmen, women who work outside the home and who are bringing up young children, and men from a poor, ethnic
group characterised by high levels of unemployment. Let us also assume that the quality improvements in people's lives from treatment are fairly similar as are the average ages of members in different groups but that QALY differences between groups exist mainly as a result of disparities in life expectancy between the groups. If the QALY ranking is businessmen first, working women with children second and poor minority group members third, then this is how health maximisers must prioritise the treatments that apply to each of these groups.

This is inappropriate. We know that life expectancy is positively correlated with socio-economic status but we do not expect entitlements to publicly funded health services to depend on this status, directly or otherwise. If poor people suffer simply because the expected QALYs generated following successful treatment are less (the poor die younger), then there is no doubt that QALY differences should be ignored.

On the other hand, it could be that expected benefits from treatment for the poor are lower, however, because they tend to lack the resources necessary to complete a course of treatment or adhere to a new set of behaviours. This is the case, for example, in the treatment of TB in developing countries which seems to be an area where it is harder to say that the QALY difference should not be taken into account in determining entitlements. As we shall note later, one area where doctors are willing to be somewhat more explicit about rationing at the patient level is where the probability of successful treatment is low.

Alternatives to Consequentialism

Objections to health maximisation draw support from four main sources: rights, social contracts, voice and community values. In the following section we discuss how each of these non-consequentialist values may be important in determining entitlements to health care. However, it should be remembered that we are advocating they be integrated into a rationing scheme that depends also on consequences, of which the QALY as a measure may be appropriate.

Rights

Famously Bentham thought rights were nonsense on stilts - though it is difficult to ignore the fact that government intervention seems premised in part on the notion of a right to some level of health care, Buchanan (1984). Philosophers have, nevertheless, questioned whether we need rights talk at all and the conclusion seems to be that although utilitarianism might be capable of incorporating rights, it leads to a rather unnatural and forced characterisation. Scanlon (1977), for example, adopts a two tier approach which allows that (1) rights might exist because ultimately they help promote people's interests (preferences) but that (2) at the level of applied ethical debate, rights are more clearly discussed outwith the utilitarian frame. Whilst accepting that part of the reason for rights might be analytical convenience and that most rights exist for consequentialist (if not necessarily utilitarian) reasons, there are examples in which a person's individual rights will always outweigh the preferences of others. See for instance Sen's (1982), example, in which a gang of sadists would get pleasure from beating someone up, and yet it seems wrong regardless of utilities derived.
The value of introducing rights based discussions into an analysis of rationing may, nonetheless, be qualitative. No individual or group has a right to any specific health treatment regardless of cost but it may be that the language of rights more closely corresponds to rationing decisions as they are debated. What needs to be said about rights and rationing requires more empirical methods than are customarily used in philosophy or economic theory.

The first point is most comfortably expressed within the context of Sen's (1985) theory of capability rights. It is, as Sugden (1993) notes, a theory being developed but its formulation as a critique of welfare economics carries a simple truth: the capability to do something is often more important than achievement itself. In development contexts, this pushes us away from simple measures of economic growth like GNP towards other statistics (literacy levels, calorie consumption etc.) which may give a richer measure of the choices people have. In health, doctors now recognise the fact that an increasing number of patients prefer to have options presented and explained. Patients want not just the achievement of good health but also the capacity to make choices concerning their health state.

The issue goes beyond questions of language. Consider an example in which parents have to choose between allowing a pair of Siamese twins to continue living in a joined state, and separation. If they remain joined, each twin's quality of life will be 0.8 (on a zero to one scale, one is best). If, on the other hand, the twins are separated there is an independent chance p that each will survive and 1-p chance that each will die. It is easy to verify that the expected QALY measure of the operation is 2p, if the probabilities of survival are independent. Health maximisation requires the operation to go ahead if 2p > 1.6 (i.e. the probability of survival is greater than 0.8). For the parents however, this is a one shot decision in which their attitudes to risk might matter. Intuitively one can see that the more risk averse the parents are, the higher the probability of success needs to be for the operation to be attractive (formally, von Neumann and Morgenstern parents will choose the operation if u(two children tied) < p2u(two children separate) + 2p(1-p)u(one child). The problem is that total expected health maximisation sets priorities according to risk neutral preferences that do not necessarily characterise the preferences of individual patients. In most cases, we would presumably let the patient choose though this does not maximise health: capabilities rights (by linking choice and benefits) provide a descriptively closer, normative model of what public health services seek to achieve.

Earlier, we mentioned a literature that attempts to ground rights in the utilitarian benefits they ultimately generate. Here we want to suggest a link that moves in the opposite direction (see Table 2):
TABLE 2 OUTCOMES BY INCOME AND ETHNIC BACKGROUND

<table>
<thead>
<tr>
<th>Income</th>
<th>High</th>
<th>Low</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnic Group</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Average QALY</td>
<td>21</td>
<td>20</td>
<td>22</td>
<td>13</td>
</tr>
<tr>
<td>Average Options</td>
<td>4.2</td>
<td>3.5</td>
<td>4.1</td>
<td>3.7</td>
</tr>
</tbody>
</table>

The table depicts data on patients categorised by income level and ethnic background (group A covers a large proportion of the population and group B covers a 'minority' group - average ages for each of the four categories are roughly similar). They have all been treated by the same clinical department and the underlying model of results is one in which an interaction term between income and ethnic grouping is significant (in both senses). From the table, it is clear that health maximisation gives health care to rich members of the minority group first and so on. We have already indicated that we believe many people would find this result inappropriate. However, we could also see these results as providing some indicator of the unit's performance in terms of meeting its goals of equality of access. Many purchasers in the UK health service are keen to monitor the extent to which various subgroups have equal access to health-care system and the deeper the notion of access one has, the more valuable output measures become. Sen's theory is motivated, in part, by an interaction between rights and states of affairs which suggests that one needs to measure both choices directly as well as their values. The data in Table 2 are illustrative of the kinds of data Sen's theory would require to be collected - in this case though more choices are offered to higher income groups, low income group members of group B appear to be given fewer choices and generate substantially fewer benefits. This data should not cause us to allocate a low priority to this group as health maximisation demands, but rather prompt health care officials to ask if certain rights are being denied systematically to members of a particular group.

ii) Promises/Actual Social Contracts

Recently an elderly person denied access to care within the NHS reminded us of the phrase 'from cradle to grave'. Many people have been paying national insurance contributions in the belief that this contributed, in effect, to an insurance policy being administered by the state and they feel the failure to meet the health needs of an ageing population is a form of contract violation. The Rawlsian veil of ignorance is a rather nice device for imagining what people might want if they were to form a just agreement ab initio but there are constraints on the extent to which the device can be applied where there are actual agreements, even if these are somewhat implicit.

Health care expenditure is highest for the young and the old so unbridled health maximisation would presumably lead to cuts in geriatric linked services. Yet the substantial redistribution of resources this implies seems to violate an actual contract between state and citizen which may also serve to undermine trust in the state's ability to
form any solid agreement with its citizenry (and not just in health care). Although surveys have shown the plausible fact that many old people would vote for treatment to be given to a young person, other things being equal, if more attention is given to what might be regarded as paid for entitlements to primary goods for elderly (e.g. access to residential care), then a contingent argument against age-based rationing may prove less easy to reject.

Our view is that social contracts are implicit but binding up to a point that is often ill-defined. In any formalisation this would have the effect that we might know what kinds of considerations to take into account, but not know a priori, what weight to give them. There is possibly one thing of use that we can say, and that is that whatever weights are given, no one expects these to endure unchanged. In decision-analytic terms, this suggests making use of appropriate variants of utility theory, in a way that draws more heavily on empirical evidence about the weights that people actually assign at any particular point in time, von Winterfeldt and Edwards (1988).

iii) Votes/Public Opinion

Voting is (said to be) an important part of democracy. Relevant to rationing are not only the substantive rights to primary goods but also procedural rights to voice and representation. Citizens have rights to express views concerning the kinds of treatments that should be provided by the state, even though these rights are rarely exercised directly. Direct action (beyond occasional demonstrations against expenditure cuts) is still rare, though district health authorities are increasingly using focus groups and surveys to determine priorities while media coverage of particular cases serves to elicit, and perhaps shape, views on rationing principles in certain specific areas.

Whether moral or otherwise, the acknowledgement of public opinion does have a normative value that may lead to conflicts with health maximisation. Advocates of health maximisation might argue that their doctrine is what voters would support if given the choice - though evidence seems to run counter to this proposal (see for instance survey work by Bowling (1996), or experimental work by Frohlich and Oppenheimer (1992)). If, however, we return to the exclusion problem it is easy to see that rational egoists would vote for treatment for members of the group to which they belong (assuming they knew which group they were in but not whether they themselves would actually contract a disease). Treatment would then go, not to members of the group first afflicted, but to members of the largest group resulting in exclusion - albeit possibly of a different group and for different reasons. Our view is that exclusion on the basis of votes has no more fairness than exclusion on the basis of QALYs and that this is the tip of an iceberg. Majority voting for a system which systematically discriminates against the needs of certain groups would lead to an unfair distribution of health-care resources, however democratic. Nevertheless organisations need public support if they are to perform their functions and this has led to the employment of a variety of needs assessment methodologies (including qualitative methods such as focus groups). Recent survey evidence, for instance, reported by economists Frey and Bohnet (1995) finds that process oriented mechanisms (c70% of their sample preferred negotiation) are preferred to decisions based solely on expert opinion and that use of economic measures like willingness-to-pay are least popular of all (acceptable to 20%).
iv) Communitarianism

Communitarianism developed as a response to problems in liberal philosophies. It sets itself against rights (Etzioni (1995) calls for a decade long moratorium on the creation of new rights) and emphasises three things: the concept of the self, political epistemology and the importance of communities, Bell (1993). Humans are conceived of as social animals with high social needs about which individualistic theories (e.g. Nozick (1974)) have little to say. Political philosophies are regarded as being located within a particular time and place which makes the search for a unique timeless framework (like utilitarianism) seem inappropriate.

As communitarianism undercuts the value of individual rights it is tempting to think that it might remove some of the constraints on health maximisation imposed by rights. In one sense it is difficult to tell, as health maximisation and communitarianism are such different kinds of theories that a comparative evaluation is not easy. It could be that health maximisation is not a universal account of health care rationing but one that suits the UK at this point in time. Further, it allows for the aggregation of preferences in determining trade-offs between expected life years and quality adjustments via the construction of the QALY measure so it might be said to have a social aspect to it. However, communitarians emphasise the importance of exchange between individuals and the local communities to which they belong. Individuals have duties to their communities, (which might well extend to minimising activities like smoking that might impose unnecessary costs on their communities) while at the same time communities value family units and act to preserve their structure. Respect for the elderly, for instance, might mean that their health is given a priority that is not sufficiently reflected in the QALYs the elderly generate. In other words communitarians might want to provide or withdraw health for reasons that are more comfortably accommodated outside health maximisation. The emphasis on duties is as non-consequentialist as is the emphasis on rights.

As far as we know, the implications of communitarianism for health care rationing have yet to be elaborated by those who advocate the doctrine. However, the doctrine is interesting in the context of this paper as it represents an emerging philosophical framework that is anti-rights and yet still suggests reasons why one might want to temper the entitlements defined under health maximisation.

v) Theoretical overview.

Drawing these issues together we argue that any normative rationing guidelines must integrate several things, the main items being: consequences, rights, votes, actual social contracts (promises). Health maximisation deals only with one of these frameworks. For empirical purposes, it is also important to factor out variables that may play a role in determining entitlements whether they are of normative significance or not - lobbying and the opinion of medics are two such variables illustrated.

If one accepts that a rationing agency might not need to adopt one approach lock, stock and barrel, then the moral theories reviewed should not be regarded as competitors but rather as complementary parts of a framework that integrates different kinds of claims. There is growing survey evidence that health maximisation is only appealing in certain contexts. For instance, Nord et al (1995) in discussing some extremely important and valuable empirical results, nevertheless closely associates the empirical rejection of health
maximisation with concern about the contribution an economic approach might make to
erationing. Our conceptualisation of rationing as a synthetic task shows that the rejection
of a decision rule like QALY maximisation is perfectly compatible with the use of
outcome measures like the QALY.

We can also use this conceptualisation to track the actual development of normative
frameworks over time. For example, the first ranking of treatments by Oregon State in
1990 was based only on an analysis of benefits and costs (consequences). However,
forced a year later to produce a more 'intuitive approach' (Peters (1995 p502)), the Health
Services Commission combined consequences with professional judgement and their own
interpretation of community values. However, this too was rejected by the Federal
Government on the grounds that it violated rights of the disabled. Though the charge was
contested, a revised version of the plan dropped reference to quality of life and used a
ranking based on mortality, with cost as a tie-break, and placed greater weight on
preventive services in recognition of community preferences. The final version of the
plan then reflects consequences (though not in the way health maximisation prescribes)
and to a small extent votes and community values. It seems to be protected from direct
lobbying influences but makes no explicit allowance for any previous social contracts or
health expertise. Whilst our analysis supports the integration on non-consequentialist
issues, there is nothing in it to recommend the wholesale eradication of quality of life
issues. One can argue that discussion of what relative weight should be given to votes
over consequences, has no analytical solution. In this sense, the communitarian concern
with universal doctrines seems right. In any case the pattern that emerges from the
Oregon experiment is one in which a relatively simple, consequence based framework, is
elaborated to incorporate normative sensitivities excluded by health maximisation.

Survey Methods and Results

Health care entitlements, we have argued, should be functionally dependent on
consequences, rights, votes, actual social contracts and community values. The decision
rule of health maximisation focuses on just one of these which is why, so we contend, the
doctrine seems so alien to many. In the following sections we test the validity of our
criticisms of health maximisation and the level of support for alternative frameworks
which we have advocated using a self-administered, anonymous questionnaire. It
identifies elements of frameworks that the public believe are important and that we
believe should be integrated with health outcomes to form an acceptable health care
rationing mechanism.

Our empirical results relate to a number of the conceptual links between QALY
maximisation, its problems, and the alternative frameworks we have discussed. First, we
shall provide evidence relating to the problem of arbitrary exclusion and people's concern
for equal treatment for those in equal need. Second, we shall provide evidence that shows
many people believe that extending the health-care benefit to incorporate various utilities,
as utilitarians would want, is inappropriate. Third, we provide evidence that indicates
many people are sensitive to information about causes and duties, as non-consequentialist
theories suggest might be appropriate. Fourth, we provide evidence that sheds light on the
extent to which people believe health-care rationing is a social choice about which voted
related information should be collected.
Specific framing issues are dealt with separately in subsequent sections but some general points about the survey design are appropriate here (see also footnote 22). Firstly, the survey was piloted using three variations of the questions before arriving at the final version. These pilots were used mainly to address individual question wording (see for instance Moser and Kalton (1971) and Dillon (1990)) but issues such as the order of questions and response rates were also examined. It was decided that none of the questions should mention costs directly but control for this by making it clear that potential patients differ only in terms of the criteria mentioned in the situation descriptions. This approach was decided on in order to avoid overly complex descriptions whilst still controlling for this obviously crucial component in decision making. Feedback at the pilot stage supported this approach.

The final version of the survey was sent out to a sample of Leicestershire residents drawn from the electoral register. This was considered the most reliable and up to date sampling frame with postal addresses available. A usable response rate of 31% was achieved (n=144). A covering letter was also sent which introduced the concept of rationing/priority setting. As a result of feedback from the pilot surveys it also explicitly stated that the study was not related to the level of funding for the National Health Service. In addition to this respondents were asked for a small number of socio-economic details. Exact, binomial confidence intervals (C.I.s) are reported where appropriate, Armitage and Berry (1994).

**Socio-economic characteristics of sample**

Respondents were asked to report details on four dimensions of socio-economic status in order for checks to be made on the representativeness of respondents to the population (Leicestershire residents). Responses to these questions are reported in table three. Also included as a means of comparison are results from the 1994/95 General Household Survey (GHS). These calculations were made after excluding all respondents aged under 16. Due to the fact that an individual must be aged 16 or over to appear on the electoral register and that the list used was compiled in October 1996, nine months previous, there is a slight under-representation of those aged under 18 in our sample. Our sample also shows a lower proportion of respondents in the age range 26-45 years and a higher number in the category 46-64 years, in comparison with the GHS. There is a significant under-representation in our sample of those in the highest income category (over £25000) whilst other
TABLE 3  SOCIO-ECONOMIC DETAILS OF SAMPLE

<table>
<thead>
<tr>
<th></th>
<th>Male N (%)</th>
<th>Female N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Age (yrs)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>18-25</td>
<td>5</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>26-45</td>
<td>23</td>
<td>14</td>
<td>37</td>
</tr>
<tr>
<td>46-64</td>
<td>25</td>
<td>31</td>
<td>56</td>
</tr>
<tr>
<td>&gt;65</td>
<td>18</td>
<td>14</td>
<td>32</td>
</tr>
<tr>
<td><strong>B. Gross Household Income (£'s per annum)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5000</td>
<td>12</td>
<td>23</td>
<td>35</td>
</tr>
<tr>
<td>5000 - 16000</td>
<td>30</td>
<td>31</td>
<td>61</td>
</tr>
<tr>
<td>16000 - 25000</td>
<td>15</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>&gt;25000</td>
<td>10</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td><strong>C. Occupation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>37</td>
<td>32</td>
<td>69</td>
</tr>
<tr>
<td>Self Employed</td>
<td>3</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Retired</td>
<td>22</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Other e.g. student, housewife</td>
<td>2</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td><strong>D. Vote in 1997 election</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservative</td>
<td>5</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Labour</td>
<td>47</td>
<td>35</td>
<td>82</td>
</tr>
<tr>
<td>Liberal</td>
<td>9</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Income categories reflect a relatively close alignment with respondents in the GHS. Notable differences occur within occupational categories, the most prominent of which is the proportion of retired persons which is lower in the GHS. Differences in other occupational categories do not exceed 5%. Further information included in table three for comparative reasons is from the 1997 general election results for Leicester. Our sample indicates a proportion of 57% of respondents voted for the Labour party in the last election, whilst only 11.1% and 10.4% voted for the Conservatives and Liberals respectively. Whilst this would appear to be a major bias in the sample, election results indicate that this is not excessive. Labour voters are over-represented only by a 10% margin whilst the variation between sample results and general election figures codes not exceed 5% for the other parties. Whilst the decision to return a usable questionnaire was a self selected action the authors believe that there are no major biases in this sample on the four socio-economic dimensions tested.
Prioritisation issues.

i) QALY maximisation and arbitrary exclusion

In this section of the survey we test the extent to which respondents agree with QALY maximisation as a rationing device by using age differences between groups of patients as a proxy for health gain. Whilst there is existing evidence to suggest that there is limited support for rationing by age\(^2\), questions here explicitly test health maximisation by controlling for factors such as prognosis after treatment.

Respondents were asked to consider how funds should be allocated between two kinds of disease if it were not possible to treat all those affected when patients differ only in age. Whilst uncertainty may be characteristic of medical decision making in practice it was decided to abstract away from this for reasons of simplicity. QALY issues were further exaggerated in the decision problem by equating treatment with full recovery, including normal life expectancy, and lack of treatment with death. Four options were presented:\(^3\)

'QALYM\textsc{AX}' (QALY maximisation) is where all resources are used to treat those in the lower age group first with those in the older group receiving treatment only if there are funds left over.

'FAV\textsc{YOUNG}' entails allocating more resources to the treatment of the disease which affects the younger group. It does give a degree of preference to the younger group and consequently does reflect a concern for health outcomes but does not necessitate the complete exclusion of a patient group from health care entitlements on grounds of age, which may be seen as somewhat arbitrary, as would occur with a health maximising approach.

'EQUAL' indicates the option of equal allocation of resources between the two diseases. 'DON'T KNOW' was also included for the undecided.

Initially respondents were asked to choose between groups where age differences were large (80 years versus 40 years). This differential was gradually reduced until groups differed by just one year (41 years versus 40 years). We would expect support for health maximisation to be more likely where age differences are largest and, given the potential for respondent anchoring, this was the first question presented. If anchoring does prevail in this context, the question format will therefore favour QALY maximisation. Results are shown in table four.

<table>
<thead>
<tr>
<th>A. Age Differentials (yrs.)</th>
<th>MEAN(^2)</th>
<th>95% C.I.'s</th>
<th>QALYMAX</th>
<th>FAV\textsc{YOUNG}</th>
<th>EQUAL</th>
<th>DON'T KNOW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>80 vs. 40</td>
<td>0.8357</td>
<td>0.7638-0.8929</td>
<td>23</td>
<td>16</td>
<td>27</td>
<td>18.8</td>
</tr>
<tr>
<td>70 vs. 40</td>
<td>0.8865</td>
<td>0.8223-0.9337</td>
<td>16</td>
<td>11.1</td>
<td>27</td>
<td>18.8</td>
</tr>
<tr>
<td>60 vs. 40</td>
<td>0.9650</td>
<td>0.9203-0.9886</td>
<td>5</td>
<td>3.5</td>
<td>15</td>
<td>10.4</td>
</tr>
<tr>
<td>50 vs. 40</td>
<td>0.9930</td>
<td>0.9617-0.9998</td>
<td>1</td>
<td>0.7</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>41 vs. 40</td>
<td>0.9930</td>
<td>0.9617-0.9998</td>
<td>1</td>
<td>0.7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Some of the more obvious, or at least commonly used statistical tests (chi and z) are not strictly applicable in this situation as responses to questions are not independent. We therefore used a replicated measures test, the Cochran Q test for differences between proportions in k (greater than two) related samples with categorical or naturally dichotomous data (Siegel and Castellan, (1988 p171). Using p to denote the proportion of subjects choosing in a way that is consistent with QALY maximisation and subscripts in an obvious fashion we conduct the test, $H_0: p_{0} = p_{1} = \cdots = p_{i} vs H_a: H_0$ false . The test statistic, Q, has a value of 58.90 and is approximately chi-squared distributed with k-1degrees of freedom when n ≥ 4 and nk ≥ 24. As n = 144 and k = 5, these conditions are met. We can, therefore, reject the possibility that the answers to the different versions of the question are drawn from the same population. A more approximate approach to our data here would be to note that in all variations, the percentages of those choosing in a manner consistent with QALY maximisation, as evidenced by the confidence intervals and as we discuss below, are always closer to 0% than 100%.

Those concerned purely with health maximisation must choose option one in all situations, irrespective of the size of age differences. The decision problem was described such that even where the age differences may be small, failure to choose this option involves a deliberate sacrifice of QALY's. Results show that support for such an approach is limited. Even in the first scenario, where one would expect support for QALY maximisation to be strongest since the age difference between the two groups of patients is largest, 95% confidence intervals indicate that the proportion of those rejecting this approach ranges from 76% - 89%. Furthermore, as age differences are reduced the proportion of respondents not agreeing with QALYMAX increases. This reaches a maximum range of 96% - 100% at a ten year age gap. These figures indicate an overwhelming rejection of the health maximising approach. Respondents generally do not agree that age should be used as a rationing device even when there are large differences between groups and therefore large differences in potential life years saved (or lost). A similar pattern is found when examining the number of respondents opting for the intermediate FAVYOUNG option with a significant level of support (19%) where age differences are largest, falling to zero when ages differ by just one year.

Whilst these results indicate a rejection of the health maximising approach to rationing they should not be seen as demonstrating a complete lack of concern over health outcomes, particularly when age differences are large. The sample mean, indicating the proportion of respondents rejecting any skewing of resources based on age, is 0.6429 (95% C.I.s, 0.56-0.72) when the first group are aged 80 years old. Although sample means increase dramatically as the age of the first group of patients is reduced, responses indicate that the proportions of those indicating any concern for health outcomes is also significant. To further understand these data, we conducted a confirmatory cluster analysis of the responses to these questions. We hypothesised that there might be three groups of respondents: strict QALY maximisers who preferred to treat the youngest in all cases; strict 'equal righters' who preferred to allocate funds equally between diseases affecting younger and older groups; and 'trade-offers' who would increasingly prefer QALY maximisation to equal priority setting as the QALY difference got larger. The results of this analysis appear in Fig 2 (a through e). What we find is that the largest of these three groups is in fact one that looks like our postulated 'equal righters' group. Two smaller clusters can also be identified, although these two groups only depart significantly in their choices from equal priority when the QALY difference is large. Cluster 1
comprises a distribution of people, though the modal choice is to allocate resources to both diseases but more to that which affects the younger patients. Cluster 3, which is slightly smaller and more homogenous than cluster 1, comprises mainly people who support QALY maximisation when the QALY difference is great. However, notice that this cluster is not equivalent to our postulated QALY maximisation group as members of it switch to equal priority as the QALY differences between the groups diminish. Using a non-parametric (chi-squared, contingency table) test, we also examined whether there were any socio-economic differences (age, sex, employment status, income category and voting behaviour) between these three clusters but were unable to find any of statistical significance.

ii) Limited appeal of forms of consequentialism
The decision rule of QALY maximisation is a variant of consequentialism since alternatives are judged only in terms of the health outcomes produced. There has been a tendency to use the term in a positive prescriptive sense despite the fact that there is not the philosophical tradition of argument for health maximisation as there is for utilitarianism, upon which traditional economic tools are based. This section tests four competing types of consequentialism that are derived from utilitarianism in that they widen concern away from the individuals health (which is the concern of QALY maximisation) towards a more utilitarian metric which would include the welfare of all actors affected by a medical procedure, rather than the individual patient.

As noted earlier, potential confounding influences were controlled by an explicit instruction to subjects to treat patients as being equal in all respects other than those which appeared in the question. However, included from the beginning of this section was the general statement that patients are similar in all aspects other than those specified. This served as a security measure against response bias without making the questions excessively repetitive or lengthening the survey. Results are shown in table five.

TABLE 5  VARIETIES OF CONSEQUENCES.

<table>
<thead>
<tr>
<th>Types of outcome</th>
<th>Mean</th>
<th>95% C.I.s</th>
<th>Consequentialist N</th>
<th>%</th>
<th>Anti- consequentialist N</th>
<th>%</th>
<th>Egalitarian N</th>
<th>%</th>
<th>Don’t Know N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Utility</td>
<td>0.8810</td>
<td>0.8113-0.9318</td>
<td>15</td>
<td>10.4</td>
<td>n/a</td>
<td>111</td>
<td>77.1</td>
<td>18</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Spouse Utility</td>
<td>0.9650</td>
<td>0.9203-0.9886</td>
<td>5</td>
<td>3.5</td>
<td>1</td>
<td>0.7</td>
<td>137</td>
<td>95.1</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Family Utility</td>
<td>0.9301</td>
<td>0.8752-0.9660</td>
<td>10</td>
<td>6.9</td>
<td>2</td>
<td>1.4</td>
<td>131</td>
<td>91</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Economic Utilitarianism</td>
<td>0.9859</td>
<td>0.9500-0.9983</td>
<td>2</td>
<td>1.4</td>
<td>14</td>
<td>9.7</td>
<td>126</td>
<td>88</td>
<td>2</td>
<td>1.4</td>
</tr>
</tbody>
</table>
Notes
1. This option was not considered relevant to this question.
2. Though our main interest is in the fact that mean proportions, as indicated by the confidence intervals, are nowhere near 0 as they would have to be if “consequence maximisation” held, we also test $H_0: p_{PU} = p_{SU} = ... = p_{EU}$ vs $H_a: Ho$ false using the $Q$ test previously discussed. In this case, $Q = 15.47$ with 3 degrees of freedom which is highly significant (i.e., $p < 0.01$). We can reject the hypothesis that the proportions choosing the “consequence maximisation” consistent choice are the same for four conditions summarised in table 5.

The first question in this section asks whether a broader measure of outcome than the health or utility of an individual patient should be used in determining entitlements to health care. Results indicate a sample mean of the proportion of people disagreeing with personal utilitarianism of 0.88 (95% C.I., 0.81-0.93). Despite the magnitude of responses favouring equality of access for patients irrespective of the effect on personal utility, there is still a greater degree of support for this type of consequentialism than the other more inclusive types tested in this section.

The three other questions included in this section were concerned with consequences outside the individual sphere. Choices were offered between patients who differ only in marital status (Spouse utility), whether they have children (family utility), or income (economic utilitarianism). Options presented corresponded with a consequentialist ideology, an anti-consequentialist view, and an egalitarian view.

Firstly, when faced with a choice between a married and an unmarried person, the proportion of those who disagree with giving priority for treatment to the married person, as indicated by the sample mean, is 0.97 (95% C.I., 0.92-0.99), indicating an overwhelming rejection of this type of consequentialism. Another criticism of the health maximising approach to prioritising health services is that it does not incorporate the effects on a patient’s dependants. Respondents were therefore presented with a choice between patients with and without children. A proportion of over 0.93 of respondents disagreed with the view that those with children should be given a higher priority than childless patients (95% C.I., 0.88-0.97), opposing the choice advocated by a consequentialist decision rule. Economic welfare was the broadest consequence respondents were asked to consider. In this question a choice between high and low wage patients was presented. In the absence of market failures, economic consequentialism advocates prioritising services for high wage earners yet our estimates show confidence intervals of the proportions rejecting this approach between 96% and 100%. Interestingly, the option to give priority to low wage earners received a significant degree of support (10%). Not only does this reinforce the strength of opinion against rationing by economic consequence but may also indicate that the concept of access to health services according to need should incorporate the ability to pay for such services privately.

Results in this section indicate that attempts to find a publicly acceptable rationing device based solely around a utilitarian philosophy will be inadequately based. Indeed, when compared to results concerning the QALY maximising approach (where age differences are largest) each of these alternatives based on broader consequences receives a lower level of support. It therefore appears that QALY maximisation is not deficient due to the
nature of the consequence (health) that is its sole concern, but because of its consequentialist nature per se. An acceptable rationing framework must incorporate broader concerns than QALY maximisation but these concerns are not consequential in nature. Subsequent sections of the survey test the acceptability of such alternative frameworks that may complement concerns for outcomes such as health gains.

iii) The Relevance of Causes.
Health maximisation focuses only on outcomes in terms of health. In common with all brands of consequentialism, it is blind to the underlying reasons for these outcomes. We focus here on the extent to which health care entitlements are affected by how treatment-needs came to be generated\(^1\). Questions are asked both in terms of specific conditions and with respect to risky behaviour in general.

In each of the scenarios presented we ask about priority setting between groups of patients suffering from the same condition such that the expected health gain from receiving treatment would, on aggregate, be the same for both groups. Results are shown in table six.

### TABLE 6  THE IMPORTANCE OF RESPONSIBILITY AND CAUSE.

<table>
<thead>
<tr>
<th>Condition and Cause</th>
<th>Mean</th>
<th>95% C.I.'s</th>
<th>Relevant N</th>
<th>Relevant %</th>
<th>Not relevant N</th>
<th>Not relevant %</th>
<th>Don't know N</th>
<th>Don't know %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS: Illegal drugs vs. blood transfusions</td>
<td>0.5954</td>
<td>0.5062-0.6802</td>
<td>78</td>
<td>54</td>
<td>53</td>
<td>37</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Lung cancer: Smokers vs. non-smokers</td>
<td>0.4706</td>
<td>0.3845-0.5580</td>
<td>64</td>
<td>44</td>
<td>72</td>
<td>50</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Mountain rescue</td>
<td>0.8529</td>
<td>0.7821-0.9078</td>
<td>116</td>
<td>81</td>
<td>20</td>
<td>14</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>General disease: Risky lifestyle vs. caution</td>
<td>0.4031</td>
<td>0.3177-0.4930</td>
<td>52</td>
<td>37</td>
<td>77</td>
<td>54</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Life expectancy: socio-economic group</td>
<td>0.9236</td>
<td>0.8674-0.9613</td>
<td>QALY max.</td>
<td>0</td>
<td>12</td>
<td>8</td>
<td>130</td>
<td>92</td>
</tr>
<tr>
<td>Life expectancy: lifestyle</td>
<td>QALY max.</td>
<td>Anti-qaly max.</td>
<td>Equal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

1 We tested \(H_0: \rho_{HIV} = \rho_{LC} = ... = \rho_{PL} vs H_a: H_0 \text{ false}\) as before. In this case, \(Q = 67.40\) with 3 degrees of freedom which is highly significant (i.e. \(p < 0.01\)).

2 We tested \(H_0: \rho_{SOC} = \rho_{PL} vs H_a: H_0 \text{ false}\). For related pairs of responses the McNemar test is used and the sample size is sufficiently large to justify using a chi-square approximation. The value of the test statistic is 9.09 allowing for a continuity correction and carries 1 degree of freedom. The null is rejected at the significance level, \(p = 0.01\).

Question one asks if priorities for treatment should differ between HIV positive persons who have become infected through the use of illegal intravenous drug use (and may be seen as responsible for their condition) and those infected through contaminated blood transfusions. Confidence intervals at the 95% level indicate that the proportion of those...
advocating preferential treatment for those infected through contaminated blood transfusions (and therefore rejecting a pure health maximising policy) ranges from 50% to 68%. A slightly lower proportion of respondents accept that cause is relevant in scenario two which presents choices between smokers and non-smokers requiring treatment for lung cancer. Confidence intervals in this situation indicate that the proportion of those choosing for non-smokers to receive a higher priority for treatment than smokers ranges from 38% to 56%. These results show that, in these specific situations, health maximisation is unpopular as it is blind to how health gains are generated.

Question three presents a similar situation in very general terms. Two groups of patients require medical treatment in a situation where there are insufficient funds to treat all those in need. One group require treatment as a result of engaging in risky behaviours whilst the other group are suffering as a result of events beyond their control. Respondents are asked to consider whether or not the cause of disease is relevant to the priority for treatment that patients should receive. In this general situation there is a slightly higher level of agreement with viewpoint that patients in each group should receive an equal priority, as consistent with consequentialism. The proportion of respondents indicating that the cause of disease is relevant in this general case, as indicated by the sample mean, is 40% (95% C.I., 0.32-0.49).

In order to provide a comparison, question four frames the problem in an area outside the health service. Respondents were asked to consider whether mountaineers should be obliged to take out insurance to cover the costs of any rescue services they may require. This situation mirrors that faced in the health service but was included to identify differences in opinions between the NHS and other services supported by resources provided by a combination of public and voluntary sources. Results show that there is a far greater level of support for non equal access to such services than in the health sector. The sample mean of the proportion of the sample supporting compulsory insurance is 0.85 (95% C.I., 0.78-0.91).

Results in this section as a whole indicate that there is a moderate level of support for allocating priorities to patients on grounds other than expected health gains. Respondents are concerned with how health care needs are generated and are prepared to discriminate against those who fail to take precautions to protect their own health. The significance of this rejection of consequentialism, and therefore QALY maximisation, is particularly important given the framing of the questions. In each of the scenarios presented, equality of opportunity for patients equated to a health maximising viewpoint. Given what we know about attitudes to the NHS this meant that the questions were biased in favour of the health maximisation standpoint. This effect is apparent from the results gained in question four which show a greater level of rejection for the QALY maximising approach outside the immediate health service. Yet despite this results indicate a high level of support for cause relevance. Two supplementary questions in this section address this bias by framing the issue in an alternative manner. Both questions present a situation where two groups of patients are suffering from similar conditions but have differing life expectancies. In the first instance this is due to economic status, with those from a wealthy background enjoying a higher life expectancy. In the second case the patient group with lower life expectancies lead lifestyles that are generally considered to be risky for health. In each of these scenarios, QALY maximisation advocates allocating priority to the group with the higher life expectancy. Results however, show an overwhelming
rejection of the QALY approach. Not one respondent opted to allocate a lower priority to the lower income group in order to generate greater health gains, with the majority opting for equal treatment of both groups. There were however, a small proportion (8%) who expressed a preference for the opposite view, that is, to give a higher priority to the low income group.

Similarly, in the second question in this section, there is little evidence of a willingness to adhere to the position advocated by the health maximising approach when this entails giving priority to a group of patients with healthy lifestyles. 95% C.I.s indicate that the proportion of persons holding a view that contradicts QALY maximisation is in a range from 87% to 96%.

Finally, we conducted an analysis of the impact of socio-economic variables on responses and found evidence only of a link with political affiliation—see table 7 below.

**TABLE 7 MAJORITY VS. EXPERT OPINION AND POLITICAL AFFILIATION.**

<table>
<thead>
<tr>
<th>Conservative</th>
<th>Labour</th>
<th>Liberal Democrat</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Popular Opinion (provide)</td>
<td>6</td>
<td>46</td>
<td>1</td>
</tr>
<tr>
<td>Expert Opinion (don't provide)</td>
<td>8</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Don't Know</td>
<td>2</td>
<td>17</td>
<td>3</td>
</tr>
</tbody>
</table>

Given that three cells in table 7 have expected values of less than 1, a chi-squared test on the raw table is inappropriate. Further, given the meaning attached to each of the categories, it would be inappropriate to collapse cells. However dropping the 'other' category, involves losing information from only one observation and seems a small cost to pay for the appropriate hypothesis test (Ho is that the distributions are independent while Ha is just the negation of Ho). For the truncated 3x3 table, chi-square is 18.400 with 4 df, which is significant at the p= 0.001 level (though strictly two out of nine (22%) of the cells have expected values of less than five while the commonly quoted rules for applying the chi-squared require that no more than 20% of the cells have expected values below five.)

Overall a strong rejection of the QALY maximising decision rule has been demonstrated. Whilst these questions cannot isolate the reasons for this rejection, it seems reasonable to suggest that this is due to concern with the way in which expected health gains are generated. The most likely confounding factor in this section is the egalitarian nature of public attitudes to the NHS which has been addressed both by including a scenario dealing with a similar issue outwith the NHS and by equating QALY maximisation variously with equality and inequality of access.
iv) Votes/public opinion

**TABLE 8  VOTER OPINION**

<table>
<thead>
<tr>
<th>Role of consultation</th>
<th>Mean</th>
<th>95% C.I.'s</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Consultation</td>
<td>2.4406</td>
<td>2.2688-2.6123</td>
<td>25</td>
<td>7</td>
<td>58</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>Exercises</td>
<td>2.4861</td>
<td>2.3075-2.6647</td>
<td>26</td>
<td>18</td>
<td>55</td>
<td>38</td>
<td>37</td>
</tr>
<tr>
<td>Surveys of Voters</td>
<td>3.3287</td>
<td>3.1556-3.5017</td>
<td>6</td>
<td>4</td>
<td>27</td>
<td>19</td>
<td>41</td>
</tr>
<tr>
<td>Private Insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirror</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note

1 We tested $H_0: p_{CE} = p_{SV} = p_{PM}$ vs $H_a: H_0$ false. In this case, as the underlying response measure is ordinal (clearly agree to clearly disagree), we use the Friedman two-way analysis for $k$ related samples. The test statistic has an approximate chi-squared distribution when the number of either observations and/or treatments is large which is the case as $n=142$ (allowing for incomplete observations which had to be removed for the analysis). The value of the test statistic, $F$, with 2 degrees of freedom is 46.82 which is highly significant (i.e., at $p < 0.01$). A correction for ties is available but may not be unbiased - the uncorrected statistic is biased but known to be conservative so gives unambiguous underestimate of the significance level.

Table eight shows responses to questions concerning citizens procedural rights in health care. Respondents were asked to consider the extent of their agreement/disagreement with three types of consultation process. The first two of these refer to methods of measuring public opinion, namely public consultations such as citizens' juries, and voter surveys. The third question asked if health services should aim to mirror a private insurance based system as traditionally advocated by economists on the grounds that this is the most effective method of representing individual preferences.

Results show that there is general support for both forms of public consultation with point estimates around 2.4 (95% C.I., 2.3-2.6), where 3 is equal to neutrality and lower numbers represent agreement. This indicates that there is general support for health authorities involving the public in rationing decisions and that the form of consultation does not significantly alter the level of this support. Average opinion is slightly against distributing resources in a similar manner to private markets, with results indicating a point estimate of 3.3 (95% C.I., 3.2-3.5). Finally, note the non-parametric test for the entire $3 \times 5$ contingency table is highly significant: chi-square = 61.117 which with $df = 8$, is significant at less than the $p = 0.001$ level.
v) Relevance of Votes and Rights

TABLE 9 VOTING AND RIGHTS.

<table>
<thead>
<tr>
<th>Reason for difference</th>
<th>Mean</th>
<th>95% C.I.s</th>
<th>Health max.</th>
<th>Public opinion</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Minority Population</td>
<td>0.1318</td>
<td>0.0787-0.2026</td>
<td>112</td>
<td>78</td>
<td>17</td>
</tr>
<tr>
<td>Popular Treatment</td>
<td>0.5897</td>
<td>0.4950-0.6798</td>
<td>48</td>
<td>33</td>
<td>69</td>
</tr>
</tbody>
</table>

Note

1. We tested $H_0: p_{MP} = p_{PT}$ vs $H_a: H_0$ false using the McNemar test for related pairs. The value of the test statistic is 46.15 allowing for a continuity correction and carries 1 degree of freedom. The null is rejected at the significance level $p = 0.01$.

Table eight shows results relating to two questions which ask respondents to consider how health priorities should be decided when there is a conflict between health maximisation, voter opinions and the rights of individual patients. We are concerned here with the identification of rights based entitlements to health care without necessarily involving a trade-off with health outcomes and indeed, as previously suggested, it may be possible to judge outcomes in terms of their rights based implications.

The first of these questions presents a situation where a health authority must decide on the priority for a disease which affects only members of an ethnic minority group, meaning that there are relatively few voters advocating a high priority for this condition since they are unlikely to be at risk. The question does not directly specify the efficiency of available treatments since pilot studies revealed that this did not influence responses and only complicated the question. There are no grounds for rejecting treatment provision on health maximisation grounds. 95% confidence intervals indicate that the proportion of those who think the health authority should respond to public opinion and give this condition a low priority ranges from 8%-20%. There is therefore general agreement with the option supported on health maximisation grounds, although we suggest a rights based argument below for these responses.

The second section presents an alternative decision problem in which voter opinion is in direct conflict with clinical opinion. Respondents are asked to consider whether a health authority should provide a treatment which has a very low expected health gain and is therefore not supported by doctors, but which the public have said should be provided. In this scenario, results illustrate a much higher tendency for respondents to disagree with health maximisation with confidence intervals range between the 50% and 68% levels.

The difference (statistically significant) between the results gained in these two questions yield important implications for the importance of rights in the rationing debate. It is clear that health maximisation or voting alone, cannot explain these results. Our suggestion is grounded in health care rights. Firstly, broad support for a rights maintenance approach to rationing is exhibited. Respondents are generally willing to reject the option favoured by
voters in question one when this would entail the violation of the rights of a specific
group (an ethnic minority). This trend is reversed in the second question where there is a
much higher level of agreement with voter opinion rather than health maximisation since
the former option entails the provision of the service. Secondly, we argue that the results
suggest a possible judgement of outcomes in terms of their implications for group rights.
Question one in particular is demonstrative of Sen’s theory of capability rights where the
outcome of providing treatment may reflect concerns for equality of access for different
groups, specifically ethnic minorities, rather than a concern with health maximisation as a
value in itself.

In closing, we might propose the following. QALY maximisation suggests that the rule
for rationing between two individual patients, with the same condition, from possibly
quite different causes, is:

\[
p(t) = \begin{cases} 
1 & \text{if } \Delta Q > 0, \\
0.5 & \text{if } \Delta Q = 0 \text{ and} \\
0 & \text{otherwise},
\end{cases}
\]

where \( p(t) \) is the probability of being treated for a person with an expected QALY
improvement at least as great as that for the other patient (\( \Delta Q > 0 \)).

The moral attitudes of our sample, on the other hand, seem to suggest \( p \) is a multivariate
function of the equal rights to treatment accorded to most patients, acceptance of proper
responsibility and perhaps some recognition of benefit in terms of quality adjusted life
year where the difference is great, e.g.:

\[
p(t) = \begin{cases} 
0.5 + f(\Delta Q) & \text{if } \Delta Q > d \text{ and } r < r^* \\
0.5 & \text{if } \Delta Q \leq d \text{ and } r < r^* \\
0 & \text{otherwise}.
\end{cases}
\]

Here, we think of equal probability as the starting point with deviations allowed for
QALY differences larger than some threshold \( d \). In addition, a person’s responsibility for
their condition must not exceed some threshold \( r^* \) - if it does, their entitlement to
treatment is withdrawn. Of course, this is just a sketch - in developing theory and
empirical work further in this area one would want to explore just when people’s apparent
preferences are sensitive to a variety of issues, including cost - the experimental literature
shows clearly that people are often indifferent to cost issues (when they are high tech) but
that costs do feature in policy on some occasions e.g. in the provision of residential care.
What should be clear is that the normative views about rationing that people have cannot
be adequately captured as a ranking of benefit-cost ratios and that the multivariate nature
of these attitudes merits further work.
Concluding Remarks

The paper provides arguments for, and supporting evidence of, deeply non-utilitarian preferences in a real and substantive social choice problem. In doing so, it also helps illustrate the practical importance of theoretical concerns about welfare economics articulated by Sen and others. The inability of adults to produce expected health gains, even at the age of 80, has for many voters surveyed, no impact on entitlements. On the other hand, we find evidence, in the aggregate, that entitlements are a function of age so it would seem that any approximately true positive theory of normative judgements must be capable of integrating consequential and de-ontological considerations.

Our sample provides evidence of a strong desire to treat people equally regardless of age but not to use the health-care system as a way of compensating for socio-economic deprivations. We suspect that both mental accounting and equality issues may be playing a role in these results. The tendency to compartmentalise could reflect a desire to simplify but it might also reflect normative beliefs which insist that individuals, rather than the health outcomes they produce, be treated equally. Whether on further reflection and perhaps on the basis of some informed debate, our respondents would still hold these normative views we cannot say though in further developments of the work we should like to explore methodologies that allow such distinctions to be made.

Sen's theory of capability rights is the only theory currently discussed by economists which performs the integration task mentioned above, yet our evidence draws attention to two further considerations. The importance of being able to formulate rights is now well understood - even if their formulation is, itself, debatable. Communitarians, however, have emphasised the importance of duties and our evidence shows that people do indeed attribute significance to duties in determining health-care entitlements and that the onus on the individual varies considerably depending on the issue involved. In addition, we have added to the growing evidence that issues of procedural fairness, particularly rights to representation and consultation, are of importance in economic decision-making. For many voters, such issues are more important than trying to produce results which mimic the outcome of a market process, though the approach is fundamental to the economic analysis of public sector provision. Our evidence suggests that in the allocation of commodities by the public sector, outcomes matter, but so do rights, duties and beliefs about due process. At least in decision theory, axiomatic approaches have not been very quick to synthesise a wide variety of different kinds of issues that we know to be empirically important. If the same is going to be true in social choice, then perhaps there is room in that literature for work on the modelling of particular and general social choice rules. If one allows for non-axiomatic approaches, then we believe that many of the issues discussed here could naturally be formalised within the now easily implementable framework offered by non-linear programming.
Acknowledgements

For comments on earlier versions and/or research design, the authors wish to thank Alan Williams, Rianon Tudor-Evans, Jim Raftery, Jean Soper, various commentators and a number of seminar participants at the London School of Tropical Medicine and Hygiene. The first author would also like to thank Professor Wulf Gaertner and participants of the 1998 Osnabruck workshop on rights, for a number of helpful comments on ideas presented in the paper. Finally, the paper has greatly benefited from the many comments of two anonymous referees to whom we extend our thanks. The usual caveat applies.
References

Arrow, K. J. (1951) Social Choice and Individual Values, New York, Wiley
Klein, R. (1994) ‘Can we restrict the health care menu?’, Health Policy, 27, 103-112
Kolm S-C. (1994) ‘Rational normative economics vs “social welfare” and “social choice”’, European Economic Review, 38, 721-730
Lewis, P.A. and Charny, M. (1989) 'Which of two individuals do you treat when their ages are different and you can’t treat both?', Journal of Medical Ethics, 15, 28-32
Loomes, G. and McKenzie, L. (1989) 'The Use of QALYs in Health Care Decision Making', Social Science and Medicine, 28, 299-308
Suzumura (1999) An Axiomatisation of Non-Consequentialism, mimeo, London School of Economics
Williams, A. (1992) 'Cost-effectiveness analysis - is it ethical?', Journal of Medical Ethics, 18, 7-11
Wright, S.J. (1986) 'Age Sex and Health: A Summary of Findings from the York Health Evaluation Survey', Discussion paper 15, Centre for Health Economics, University of York
Appendix 1A. Questions testing QALY maximisation.

In each of the following scenarios you are asked to consider how funds should be allocated between two kinds of diseases. When doctors treat a person with either disease they can be expected to make a perfect recovery and have an average life expectancy. However, if left untreated, patients die quickly. The patients affected by each disease are similar with the exception of the age differences that are described in each of the particular scenarios below.

5i.
Disease A strikes members of one group when they are 40 years old while disease B strikes members of another group when they are 80 years old. How should funds be allocated?

• Funds should be used to treat all those affected by disease A (40 year olds) first. Only if there are funds left over should disease B (80 year olds) be treated.
• The funds should be used to treat those affected by disease A more than disease B.
• Funds should be allocated equally between both diseases.
• Don’t know

5ii.
Disease A strikes members of one group when they are 40 years old while disease C strikes members of another group when they are 70 years old. How should funds be allocated?

• Funds should be used to treat all those affected by disease A (40 year olds) first. Only if there are funds left over should disease C (70 year olds) be treated.
• The funds should be used to treat those affected by disease A more than disease C.
• Funds should be allocated equally between both diseases.
• Don’t know

5iii.
Disease A strikes members of one group when they are 40 years old while disease D strikes members of another group when they are 60 years old. How should funds be allocated?

• Funds should be used to treat all those affected by disease A (40 year olds) first. Only if there are funds left over should disease D (60 year olds) be treated.
• The funds should be used to treat those affected by disease A more than disease D.
• Funds should be allocated equally between both diseases.
• Don’t know

5iv.
Disease A strikes members of one group when they are 40 years old while disease E strikes members of another group when they are 50 years old. How should funds be allocated?
• Funds should be used to treat all those affected by disease A (40 year olds) first. Only if there are funds left over should disease E (50 year olds) be treated.
• The funds should be used to treat those affected by disease A more than disease E.
• Funds should be allocated equally between both diseases.
• Don’t know

5v.
Disease A strikes members of one group when they are 40 years old while disease F strikes members of another group when they are 41 years old. How should funds be allocated?

• Funds should be used to treat all those affected by disease A (40 year olds) first. Only if there are funds left over should disease F (41 year olds) be treated.
• The funds should be used to treat those affected by disease A more than disease F.
• Funds should be allocated equally between both diseases.
• Don’t know

Appendix 1B. Questions testing varieties of consequentialism.

Question 1.
Imagine a situation where there are two patients suffering from a similar condition. The patients are the same sex, age, and both are single. In such a case, do you think it is acceptable to decide which one gets priority based on an assessment of how much pleasure each person gets from living?

• The pleasure a person gets from life should be taken into account
• The pleasure a person gets from life should not be taken into account
• Don’t know

Question 2.
If it were necessary to make a choice between treating one patient or another, do you think that it is acceptable to give priority to a person who is married over someone who is not married?

• A married person should be given priority.
• A non-married person should be given priority
• Whether a person is married should not be taken into account when priorities are decided.
• Don’t know.

Question 3.
If it were necessary to make a choice between treating one patient or another, do you think that it is acceptable to give priority to a person who has children, if the patients were similar in all other respects?

• Priority should be given to people with children.
• Priority should be given to people with no children.
• Whether a person has children or not should not affect their entitlement to health care.
Question 4.
If it were necessary to make a choice between treating one of two kinds of diseases, do you think that it is acceptable to take account of the earnings of those groups of people affected by each disease?

- Priority should be given to the disease that affects people on higher incomes
- Priority should be given to people on lower incomes
- The incomes of people affected by a disease should not be taken into account when determining which disease to treat
- Don’t know

Appendix 1C. Questions testing the relevance of causes in health care rationing decisions.

Question 6.
Do you believe that those who contract HIV through injecting illegal drugs should be a lower priority for treatment than those who contracted the disease through being given contaminated blood transfusions?

- Those who contract HIV through injecting illegal drugs should be a lower priority than those who contract HIV through blood transfusions.
- Those who contract HIV via illegal drug use should be given the same access to treatment as those who contract HIV via contaminated blood products.
- Don’t know

Question 7.
Do you believe that smokers who contract lung cancer should be given the same access to expensive treatment as non-smokers who contract lung-cancer?

- Smokers who contract lung cancer should be given the same access to expensive treatment as non-smokers
- Non smokers should be given a higher priority for treatment of lung cancer than smokers.
- Don’t know

Question 8.
Do you believe that mountain climbers should be required to take out an insurance policy to pay for any rescue services that they might require in the event of an accident?

- Mountain climbers should be required to take out insurance policies to pay for any rescue services
- Mountain climbers should not be required to take out insurance policies to pay for any rescue services
- Don’t know
Question 9.
Do you believe that people who knowingly take risks with their health (for example, excessive eating of fatty foods, hang-gliding, reckless driving) should be given a lower priority for treatment compared with patients who suffer from events beyond their control (for example, genuine accidents or genetic disorders)?

- Knowing risk-takers should be given lower priority when determining access to health-care treatment
- Knowing risk-takers should be given the same priority as everyone else when determining access to health-care treatment
- Don’t know

Question 10.
Imagine a situation in which a disease affects two groups of people. Both groups are affected when they are 65 years old. Members of group A come from poor backgrounds and only have a life expectancy of 70 years whereas members of group B come from a wealthy background and have a life expectancy of 85 years. (On average, wealthy people live longer than the less well off). Which group should receive priority?

- The wealthy group with the higher life expectancy should have the highest priority for health care treatment.
- The less well-off group with the lower life expectancy should have the highest priority for health care treatment
- Each should have equal priority
- Don’t know

Question 11.
Imagine a situation in which a disease affects two groups of people. Both groups are affected when they are 65 years old. Members of group A only have a life expectancy of 70 years whereas members of group B have a life expectancy of 85 years due to different types of lifestyles. Which group should receive priority?

- The group with the higher life expectancy should have the highest priority for health care treatment.
- The group with the lower life expectancy should have the highest priority for health care treatment.
- Each should have equal priority
- Don’t know
Appendix 1D. Questions testing attitudes to procedural rights in health care priority setting.

Question 14.
Some people argue that health authorities should conduct consultation exercises (public meetings, asking groups made up from the public) to determine what health care treatments are provided for patients in their areas. Do you agree?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Question 15.
Some people argue that health authorities should conduct surveys of voters to determine what health care treatments are provided for the patients in their areas. Do you agree?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Question 16.
Some people argue that health authorities should try to base the provision of health services on what services people would buy if they had to take out private health-care insurance. Do you agree?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Appendix 1E. Questions testing opinions on health maximisation, rights and public opinion.

Question 12.
It is shown that only members of an ethnic minority are at risk from a particular disease. However, the general public in the area vote that it should only be given a low priority by the health authority. Do you think that the health authority should take this into account when deciding which services will be provided?

- The health authority should give this disease a low priority.
• The health authority should not listen to these opinions when deciding which treatments will be provided.
• Don’t know.

**Question 13.**
If a health authority conducts a poll which shows that the majority of people think that a particular treatment should be provided, but doctors argue that it is rarely successful and should not be provided, what do you think should happen?

• The treatment should be provided.
• The treatment should not be provided.
• Don’t know
Fig 2a: 80 vs 40 yrs
Fig 2b: 70 vs 40 yrs

[Graph showing the comparison between 70 and 40 years respondents across different response categories.]
Fig 2c: 60 vs 40 yrs
Fig 2d: 50 vs 40 yrs
Fig 2e: 41 vs 40 yrs

respondents

response category

cluster 1

cluster 2

cluster 3

response category
Burrows and Brown (1993) survey a number of pertinent objections based on concerns about the reliability and validity of the QALY measure. These considerations are excluded from the present discussion since our concern here is with the acceptability of the QALY as a rule: a discussion which precedes consideration of the QALY as a measure.

Health maximisation in the form of QALYs, utilitarianism and consequentialism are all distinct but related social choice objectives; the first two being species of the latter as each judges states of the world solely in terms of outcomes (health and utilities respectively). The recognition of this relationship is important. Whilst criticisms of consequentialism apply to both QALY maximisation and utilitarianism, there are also informative distinctions. For example, QALY maximisation typically excludes information about benefits to everyone except the patient and may therefore provide a better basis for public policy than utilitarianism.

The decision problem is one which, at the time of writing, faced district health authorities in the UK.

For example, the failed health maximisation rationing scheme of Oregon in 1990.

Studies have focussed on 'process utility' in specific treatment areas, see for example Ryan (1999).

The analogy here is with decision theory which has benefited in recent years from a close link between mathematical developments and behavioural evidence – see Machina (1989) or Anand (1993).

Questions asked are presented in appendices for referees not intended for publication. A copy of the survey instrument is available from the authors.

This is the conditional probability of contracting the disease, given membership of X.

An important feature of the example is that it frames the allocation decision as one in which group entitlements are set. Sometimes decision problems at the level of individual choice are adequate but the group setting is strictly a more accurate level of rationing at this level.

We thank an anonymous referee for this point.

Levin (1981) provides a useful discussion.

We believe, however, that similar comments could be made about both examples. Harris (1995) argues that rational egoists would only choose to allocate resources to the individual with the "stronger interest in continuing to live" if they also had a reason to suppose that he or she is more likely to be that person.

We thank an anonymous referee for this insight. Haranany (op cit.) is one of a number of people who argue that rational agents could be risk preferring or risk averse - a point perfectly compatible with the view that most people are risk averse in many everyday situations.

Of course, we are not saying that causes always matter - but even where they do not matter, there may be other reasons for rejecting QALY maximisation. For example, our arbitrary exclusion problem does not depend on the existence of causal relations that support the ascription of blame. We thank one of the referees for raising the issue.

The expectation is normative - in reality the relation is precisely what we would expect to find.

In a sense our argument is a relation to Harris's (1987) discussion of priority setting with the disabled and might be seen as an extension of his critique of health maximisation.

Dworkin (1977) proposes a view in which rights are regarded as moral trumps i.e. they enter into social decision-making processes lexicographically. Hart (1979) provides a stiff challenge to Dworkin's account but their exchange over the problem of double counting suggests that health policy clearly rejects the utilitarian position. The problem of double counting is just what health care entitlements to set for people on whose continued existence the pleasure of many depends. Hart's attempted counter argument is that no double counting is involved as all preferences are only counted once. Dworkin's complaint is really about the unequal final weight given to someone who just happened to be popular. This seems to be one area in which health maximisation seems to be closer to what might be regarded as appropriate for health policy than utilitarianism.

Sen suggests that people have capability rights, that is rights to be able to choose different functionings where functionings consist of the ability to achieve certain physical or social goals.

The reading of the data, we have suggested, is the one that would come most naturally to those who work in the NHS, though as Smith (1990) and Maynard (1995) point out, the outcome data is unlikely to exist. The vast majority of performance indicators in the NHS are process related.

Whether voting constitutes an ethical approach to social decision-making may be debatable but it is worth noting that the key difference between social choice (following Arrow (1951)) and utilitarianism is only the extent to which preferences are treated as cardinal measureable.

Recent economic theory deals with the most general mathematical characterisation of rights, see for instance Pattanaik (1994), Fleurbaey and Gaertner (1996). It is too early to say what contribution this
literature will have to rationing decisions where the respecting of rights is important but it may be that the literature will serve to provide a taxonomy of formal kinds of rights that health care allocation decisions address.

The questionnaire was designed to minimise the impact of a number of potential problems discussed in literature on survey design. First we ensured that question words were as neutral in the description of options as possible. In some cases, we used the phrase 'some people argue that...' to reduce bias due to perceptions of what might be socially acceptable answers - though we note also that in many cases, because different welfare/moral theories prescribe different courses of action - all responses could be argued to socially desirable. We also sought to describe options in as symmetrical a way as possible. By contrast, open form questions have been shown to elicit (Dillon op cit p118) more reports of socially undesirable behaviour but we felt that this was not a major concern here and that the demands of quantitative analysis more than justified our use of closed form questions. We included don't know and equal preference response options wherever possible as we did not want to force a preference where none existed. Introduction of 'don't know' options has been shown to reduce agreement with other substantive options but we found that very few respondents checked this item when given the option. In their discussion of the particular problems associated with opinion surveys, the statisticians Moser and Kalton (op cit.) identify two kinds of responses: the first tries to estimate (and put bounds on) the proportion of a population who agree with a particular opinion whilst the second asks individuals a series of questions in order to provide an overall measurement of attitudes. As our empirical analysis is driven by the theory of QALY maximisation, and as we have collected (ex ante and ex post) information establishing the relation of our sample to its population, our work, especially the confidence intervals we provide, primarily illustrates the former strategy. That said, the fact that most people seem to believe that patients should be given equal priority with some diminution of the effect when age differences are very large indicates evidence of overall attitudes also.

Figures for age, income and occupation are taken from the General Household Survey of 1994/95. (n=18237).

Voting behaviour taken from 1997 general election results, Leicester wards.

Source: Press Association.

See for example Nord et al. (1995) for survey work in Australia. Kuder (1993) for focus group evidence in USA. Bowling (1996) does include the topic of age in her survey work based in the UK but questions are not controlled in such a way that implications for QALY maximisation can be drawn.

Lewis and Charny (1989) offered a sample of Welsh voters choices between individuals differing only by age and found that, in two of the three examples, there was support for treating the younger patient. However, respondents were discouraged from choosing equal priority. Furthermore, in the example which had the smallest difference in age between the two individuals (35 year old versus a 60 year old), over half of those who chose to allocate resources to the younger patient reported doing so only with difficulty. Interestingly, in their third example, voters preferred to treat an 8-year-old in preference to a two-year-old.

See appendix 1A for the exact wording in this section.

We are grateful to one of the referees for pressing us on this point.

We used commonly employed techniques. Everitt and Dunn (1991). Ward's technique for assigning members to clusters is to used to avoid the problem of 'chaining' - that is the construction of artificial clusters that can arise if nearest elements to a cluster boundary are selected, regardless of their relation to the cluster centre. Distances between members were operationalised using the Euclidean distance - in the case of cluster analysis, the Euclidean distance is the n dimensional equivalent of the shortest distance between two points as specified by a straight line between them.

For exact questions see Appendix 1B.

For exact questions see Appendix 1C.

We used commonly employed techniques. Everitt and Dunn (1991). Ward's technique for assigning members to clusters is to used to avoid the problem of 'chaining' - that is the construction of artificial clusters that can arise if nearest elements to a cluster boundary are selected, regardless of their relation to the cluster centre. Distances between members were operationalised using the Euclidean distance - in the case of cluster analysis, the Euclidean distance is the n dimensional equivalent of the shortest distance between two points as specified by a straight line between them.

For exact questions see Appendix 1B.

For exact questions see Appendix 1C.

For exact questions see Appendix 1D.

For exact questions see Appendix 1E.

Sen (1985b) calls this the reflection test of rational choice.
<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Authors</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valuing the environmental impacts of open cast coal mining: the case of the Trent Valley in North Staffordshire</td>
<td>Andrew B Trigg and W Richard Dubourg</td>
<td>June 1993</td>
</tr>
<tr>
<td>2</td>
<td>Scarcity and stability in a very simple general equilibrium model</td>
<td>Vivienne Brown</td>
<td>February 1994</td>
</tr>
<tr>
<td>3</td>
<td>A conflict model, with rational expectations, of the disinflation of the early 1980s</td>
<td>Graham Dawson</td>
<td>February 1994</td>
</tr>
<tr>
<td>4</td>
<td>Foreign Investment. Globalisation and International Economic Governance</td>
<td>Graham Thompson</td>
<td>May 1994</td>
</tr>
<tr>
<td>5</td>
<td>Testing the Small Country Hypothesis for Developing Countries</td>
<td>Jonathan Perraton</td>
<td>December 1994</td>
</tr>
<tr>
<td>6</td>
<td>The Discovery of 'Unpaid Work': the social consequences of the expansion of 'work'</td>
<td>Sue Himmelweit</td>
<td>June 1995</td>
</tr>
<tr>
<td>7</td>
<td>Exit. Voice and Values in Economic Institutions</td>
<td>Graham Dawson</td>
<td>June 1995</td>
</tr>
<tr>
<td>8</td>
<td>Residential Summer Schools Attendance and Students' Assessed Performances on Open University Foundation Courses</td>
<td>Alan Gillie and Alan Woodley</td>
<td>June 1995</td>
</tr>
<tr>
<td>9</td>
<td>Putting Words into People's Mouths? Economic Culture and its Implications for Local Government</td>
<td>Maureen Mackintosh</td>
<td>December 1995</td>
</tr>
<tr>
<td>10</td>
<td>What is a Fair Wage? A Critique of the Concept of the Value of Labour-Power</td>
<td>Susan Himmelweit</td>
<td>December 1995</td>
</tr>
<tr>
<td>11</td>
<td>The Origin of the Poverty Line</td>
<td>Alan Gillie</td>
<td>December 1995</td>
</tr>
<tr>
<td>12</td>
<td>The Determinants of Product and Process Innovations</td>
<td>Roberto Simonetti, Daniele Archibugi, Rinaldo Evangelista</td>
<td>February 1996</td>
</tr>
</tbody>
</table>
Economics Research at The Open University

Throughout the 1990s, The Open University has been developing its research capacity in economics. Economists at the OU comprise a lively and expanding group with a wide set of interests ranging from development policy to decision theory, from Marxist theories of profit to libertarian foundations of environmental policy and from econometric analysis of large data sets through institutional economics to the use of case-studies in policy formation. Nearly a 1000 students from around the world register each year to study economics courses and their needs, together with the multi-disciplinary nature of social science at the university, shape out research. Through a variety of personal and group research projects, our work makes a strong contribution to areas like business, public policy and even philosophy where sharply focused analysis can inform decision-making as well as contribute to scientific progress.

In 1999, approximately £250,000 million worth of externally funded grants (3 from the ESRC) were held by discipline members, some of whom also act as consultants to national and international bodies. Approximately half a dozen students are currently reading for doctorates with members of the discipline and we are always interested in proposals from colleagues or potential students who would like to do research with us.