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The social welfare function and individual responsibility: Some theoretical issues and empirical evidence

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ABSTRACT

The literature on income distribution has attempted to evaluate different degrees of *inequality* using a social welfare function (SWF) approach. However, it has largely ignored the source of such inequalities, and has thus failed to consider different degrees of *inequity*. The literature on egalitarianism has addressed issues of equity, largely in relation to individual responsibility. This paper builds upon these two literatures, and introduces individual responsibility into the SWF. Results from a small-scale study of people's preferences in relation to the distribution of health benefits are presented to illustrate how the parameter values of a SWF might be determined.

1. Introduction

How to allocate resources in the public sector so as to achieve a fair and efficient distribution of benefits has been a major concern for economists. A social welfare function (SWF), which seeks to show the trade-off between the maximisation of benefits and an equitable distribution of those benefits, is often used to analyse distributional issues. There are a number of ways in which the SWF can be specified and there has been much theoretical work in this area. There have been some, though far fewer, attempts to estimate SWFs from the stated preferences of individuals. In an extensive programme of research over many years, Amiel and Cowell (1999) have, in various ways, asked respondents to choose between different distributions of income in order to explore the extent to which axioms used in the income distribution literature are supported by the lay public. Devooght (2003) has used similar questions to explore popular support for different aspects of inequality. The results from these studies can be used to determine the SWF for income.

These studies have focused on the extent to which people are willing to trade-off overall benefits for a more equal distribution of benefits. In other words, they have looked at *equality*-efficiency trade-offs on the assumption that "none of the income differences is resulting from personal fault or voluntary choice" (Devooght, 2003). But is an unequal distribution necessarily an inequitable one? Might some inequalities (in income, health or whatever) be considered fair? To answer these questions – about *equity*-efficiency trade-offs – we would need to know something about the reasons for the inequalities. If, for example, they were caused by factors outside people's control, then we might be willing to pay a higher price (in terms of overall benefits foregone) in order to reduce them. If, however, the inequalities were the result of

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people's autonomous choices, then we might see them as the acceptable consequences of expressions of free will (Miller, 1992).

There has been much debate in the literature on egalitarianism about the role that individual responsibility should play in judging the fairness of various inequalities in society. The central question for any egalitarian theory is "equality of what?". This question involves identifying those things that ought – and ought not – to be equal across individuals. Dworkin (1981a,b) draws a distinction – referred to as Dworkin's cut – between an individual's "preferences" and his "resources", holding him responsible for inequalities that result from differences in the former but not the latter. Cohen (1989) redefines this distinction to be one between "choice" and "luck" (also see the works of Rawls, 1971; Arneson, 1990; and Roemer, 1993). Fleurbaey (1995a,b) distinguishes further between kinds of responsibility (by individual "control" or by social "delegation") and the object of responsibility (over "factors" or over "outcomes"), and argues for the equality of delegated outcomes. Whatever the details of the different approaches, the key egalitarian concept is that inequalities for which individuals can be held responsible may not be unjust. We recognise that the unfairness or otherwise of a given distribution will depend on a number of factors (not least the quantity that is being distributed) but here we are concerned with the issue of responsibility.

If we are to say something meaningful about equity-efficiency trade-offs, and hence to express this in a SWF, we need to go beyond consequences and consider the *causes* of, and whether individuals can be held responsible for, any inequalities in addition to their extent. If people were concerned about unequal distributions but, at the same time, were not equally averse to all inequalities, then we would need to address these two factors separately. Section 2 sets out the functional form of the SWF used in this study, and then considers health as the desideratum to be distributed between individuals. Section 3 discusses the relevance of different causes of health inequality, and Section 4 illustrates how, based on empirical data, the parameters of the SWF can be determined. Section 5 presents the results from an empirical study that elicited the general public's preferences over the equity-efficiency trade-off in health, and these data are used to determine the parameters of the SWF. Section 6 discusses the implications of the results for estimating the parameters of SWFs across different contexts.

2. The social welfare function

There are a number of functional forms that the SWF can take. In order to deal with varying degrees of inequality, an additive SWF with convexity to the origin to allow for inequality aversion has been widely used in the literature (Layard and Walters, 1994; Ray, 1984; Little and Mirrlees, 1974; Wagstaff, 1994). This kind of generalised Benthamite SWF can be traced back to Atkinson (1970). In this paper, a SWF with a constant elasticity of substitution (CES) for the two-party case is assumed, so that

$$W = [\alpha U_A^{-r} + (1-\alpha)U_B^{-r}]^{-\frac{1}{r}}, \quad U_A, U_B \geq 0, \quad 0 \leq \alpha \leq 1, \quad r \geq -1, \quad r \neq 0, \tag{1}$$

where W is the level of social welfare and U_A and U_B are the total level of individual well-being (u_i) of groups A and B so that $U = \Sigma u_i$. What U and u_i actually represent can be kept fairly open so long as (a) it is a measure of well-being which is capable of being expressed on a cardinal ratio scale; (b) the individual well-being functions are identical across individuals; and (c) the level of u_i associated with being dead is zero. The groups A and B are of equal size, homogeneous, and identical in terms of their non-responsibility attributes.

This specification utilises two separate parameters, which is convenient for the purpose of this paper. As is well established, parameter r of Eq. (1) represents the degree of inequality aversion, ranging from the inequality neutral utilitarian-type SWF at $r = -1$, to the maximum Rawlsian-type SWF as r approaches infinity. The parameter α reflects the weight given to one group relative to the other, and is reflected by the steepness of the iso-welfare contours about the 45° ray. If both groups are weighted equally in the social welfare calculus, then $\alpha = (1-\alpha) = 0.5$, thus resulting in contours that are symmetric around the 45° ray, with a gradient of −1. When $\alpha \neq (1-\alpha)$, the contour will be asymmetric, and the gradient at the intersection with the 45° ray will be less steep when $\alpha < (1-\alpha)$, and more steep when $\alpha > (1-\alpha)$.

Whilst the asymmetric case of $\alpha \neq (1-\alpha)$ is presented as the "generalised" form of the Benthamite SWF, the literature typically assumes symmetry and thus $\alpha = (1-\alpha)$. In relation to income distribution, for example, the argument is that the social welfare calculus should ignore information about individuals other than their income levels (Musgrave, 1959; Boadway and Bruce, 1984; Harsanyi, 1982). This *anonymity* requirement implies that all parties are equally deserving of any given gain in well-being, but in what follows this should be restricted to attributes beyond an individual's responsibility. If, for example, the extent to which individuals have control over their well-being is relevant, then the SWF needs to reflect this. The size of these two parameters r and α are not determined by preferences of individuals as private consumers but, rather, by the preferences of citizens detached from their own self-interest (Dolan et al., 2003).

Most SWFs rely on an individual's subjective assessment of her own *utility*. Whilst there has been increasing interest in the *source* of an individual's utility – for example, correcting it for mistaken beliefs (Broome, 1991) or excluding certain 'antisocial' preferences, such as envy and malice (Harsanyi, 1982) – all standard economic models are concerned with the distribution of individual utility. As a result, the *reasons* why one individual may obtain more utility than another from the consumption of a good is not an issue: one may have different needs or one may simply be a more effective 'pleasure generating machine' i.e. he may be easier to please.

However, ignoring the source of differences in individual utility may also have damaging limitations in the context of interpersonal comparisons of well-being (Sen, 1987). The utility that an individual gets from a given input is to some extent determined by her past investment (for example, a poorly educated person may be less productive, or resourceful, in generating utility from unit consumption) and by her expectations (a socially disadvantaged person may adapt not to expect much). And because of this, a deprived poor person might generate less utility from a given health improvement, say, than a richer person. In addition, if utility is captured with reference to compensating or equivalent variation, then the same health improvement will register as a larger utility improvement when it is given to a richer person than to a poorer person. If health care were to be distributed so as to maximise utility, then in such circumstances the rich person would be given priority. This is a solution that would contradict many people's conception of fairness.

This has led to alternative conceptions of welfare that, in various ways, use 'objective' criteria to define well-being. For example, Sen (1987) has argued that attention should be focused on an individual's *basic capabilities*, which looks at what certain goods (such as health care) can do for her, rather than at the utility she derives from them. Sen's work has been influential in the debate about why health care is considered to be more important than many other commodities. For example, Culyer has argued that health care, through its impact on health, enables an individual to 'flourish' (Culyer, 1989). So people *need* health care that improves their health. Thus, in the case of distributing health care, what matters is not an individual's subjective assessment of her own utility from health care but rather an 'objective' assessment of the improved health that health care may produce.

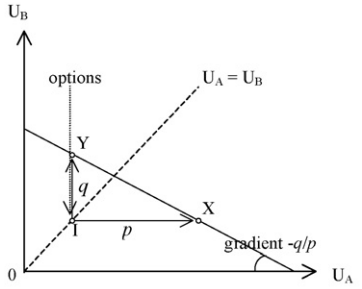
When the objective is to distribute health (rather than utility), the SWF approach is potentially useful in a policy context since health is more readily interpersonally comparable than utility is (Olsen, 1997; Dolan, 1998). Of course, health is a multidimensional good and, although there is a well-established literature on 'health-related quality of life' that attempts to represent its value in preference-based single indices, this concept is not easy to convey to lay participants in empirical studies. In the study we report here, we use two simple measures of health: one is survival, and the other is the prevalence of long-term illness. We recognise that a richer person may derive more overall well-being from a given level of health than a poorer person but simply consider health to be one possible measure of well-being for policy purposes and not necessarily the only or most complete one. In this regard, our view of health is similar to how many economists view income.

3. The causes of health inequalities

Some inequalities in health might be considered less inequitable than others if they are attributed to individual responsibility. For example, see Dias and Jones (2007) where the relevance of this literature to health economics is reviewed. Furthermore, le Grand (1991) has argued that entitlements to public services depend in part on the goodness of social actions, and so a citizen who has been destructive to her health might be called upon to contribute more in order to enjoy the same services as somebody who has not (also see Cappelen and Norheim, 2005). And Roemer (1993) suggests that different choices in relation to lifestyle etc. are legitimate grounds for different entitlements – provided that proper allowance has been made for the fact that some 'types' of people need to expend less effort to make the same choices as others. There is obviously much controversy around the issues e.g. insofar as the degree of control that people have over their own actions is concerned, and the extent to which there exists a relationship between a particular action and subsequent ill health. We make no substantive claims about these issues here (see Wikler, 2004, for a review of the theoretical literature, where the relationships between responsibility, freedom, choice, and luck in the context of public health are discussed): for our purposes, we need assume that all conditions can be located along an analytical spectrum from being *exogenously* determined (e.g. due to 'bad luck') through to being *endogenously* determined (e.g. as a result of well-informed 'own choices').

So far as the exogenous causes of ill health are concerned, some people might simply have been unlucky in the biological lottery to be born with an inherited disease, whilst others may have been the innocent victims of an identified cause of their ill health, e.g. being hit by a car on the pavement. In such circumstances, where an individual experiences ill health through no fault of her own, it would seem that she has a relatively large claim to improved health through publicly funded health care. With endogenous causes, ill health would rarely be entirely attributable to a person's own actions – for example, with smoking-related conditions there is much unexplained variation in who contracts those conditions. Nevertheless, most people would consider ill health as a result of smoking to be located closer towards the endogenous end of the spectrum than ill health through genetic inheritance, and that is all that is required here for smokers to be afforded a relatively smaller claim to improved health from health care than those with inherited diseases.

There is now empirical evidence that many people wish to give less priority to those who are considered to be in some way responsible for their ill health. For example, a large-scale general population survey found that about 50% of the UK general public support discrimination against smokers (Jowell et al., 1998). Further, in a study that explicitly explored the location of Dworkin's cut, Schokkaert and Devooght (2003) found that the modal preference was not to compensate smokers with lung cancer who incurred extra treatment costs – in contrast with the case of genetic disorders, where the overwhelming majority supported full or partial compensation of the extra cost. However, on the other hand, there are also studies where the majority of those surveyed did not wish to give less priority to people who are in some way responsible for their own ill health (see for example Dolan et al., 1999; NICE, 2002).



U_A: well-being, or health, of the group that has not taken care of themselves

U_B: well-being, or health of the group that has taken care of themselves

I: initial point

X: outcome offered by programme 1: save $p = 100$ individuals from group A

options: the set of options offered by programme 2: save q individuals from group B

Y: the point at which a given respondent is indifferent between the two programmes

Fig. 1. Eliciting the value of α.

If people with the same level of health are seen to have different claims depending on where they fall on the endogenous/exogenous spectrum, then it should also be the case that those granted smaller (larger) claims would continue to do so even when their health is worse (better). Our proposal is to capture this in terms of the relative weight parameter, α. Based purely on concerns for equality, those in worse health (such as smokers) have the potential to be given a larger weight due to the parameter r in Eq. (1). But if smoking is to some extent a matter of individual responsibility, and if this means that their health counts less in the social welfare calculus, then this can be represented by $\alpha \neq 0.5$ in favour of non-smokers, which will work to partially or even fully cancel out the effect of inequality aversion. An interesting issue, then, is whether or not individual responsibility associated with smoking is strong enough to overturn the concern for the smokers' poorer health. To answer this question, we need empirical data to determine the parameter values of both r and α in the SWF.

4. Using empirical data to capture aversion to inequality and degree of responsibility

In order to calculate the values of r and α, we need to identify two points on the same contour that are judged to be equally good *in terms of social welfare*. Note that this requires respondents to identify points that they consider to be equally good for society, rather than points they consider to be equally good for them personally, or for any particular party. As such, the exercise taps into the respondents' detached and unbiased preferences *as citizens*, rather than *as consumers* (Dolan et al., 2003).

We can calculate the value of r if we know two points on the same contour, and the value of α. An empirical study should identify two points, X and Y, that are equally good in terms of social welfare, lying on the same side of the 45° ray. Then, the marginal rate of substation (MRS) at the midpoint of X and Y along the contour can be expressed as

$$-\frac{dU_B}{dU_A}\bigg|_{\frac{1}{2}(X+Y)} = \frac{\alpha}{(1-\alpha)}\left[\frac{U_B}{U_A}\right]^{(1+r)} = \frac{\alpha}{(1-\alpha)}\left[\frac{((U_B(X_B)+U_B(Y_B))/2)}{((U_A(X_A)+U_A(Y_A))/2)}\right]^{(1+r)}.$$

Further, by definition,

$$\frac{dU_B}{dU_A} \approx \frac{U_B(Y_B)-U_B(X_B)}{U_A(Y_A)-U_A(X_A)}$$

applies as an approximation at the same point. By taking the logarithms of these, and solving for r,

$$r \approx \frac{\log[(U_B(X_B)-U_B(Y_B))/(U_A(Y_A)-U_A(X_A))] - \log[\alpha/(1-\alpha)]}{\log[(U_B(X_B)+U_B(Y_B))/(U_A(X_A)+U_A(Y_A))]} - 1. \tag{2}$$

Thus, the value of r is approximated as a function of α, and it is straightforward to show that there is only one value of r for each value of α.

Along the 45° diagonal, where $U_A = U_B$, the MRS is independent of r and is entirely a function of α, and this fact can be used to calculate the value of α. Starting from an initial point, where $U_A = U_B$, an empirical study could seek to identify another set of states, X and Y, with the same level of social welfare (see Fig. 1). Under state X, group A will enjoy a

Table 1
Person trade-off question.

No. of people who have not cared for their health (p)	No. of people who have cared for their health (q)	Distribution of responses $n = 56$	Implied α	Implied weight for those who have not taken care of their health at initial point
100	100 or more	1	0.5	1.000
100	97.5	4	0.49	0.975
100	77.5	21	0.44	0.775
100	45.0	24	0.31	0.450
100	17.5	1	0.15	0.175
100	5 or less	5	0.05	0.050

health improvement of p whilst the health of group B will remain the same. Under state Y, group B will enjoy a health improvement of q whilst the health of group A will remain the same. If p and q are sufficiently small, then the gradient of the tangent at the initial point can be approximated by the ratio $-q/p$, and the gradient of the indifference curve will be

$$-\left.\frac{dU_A}{dU_B}\right|_{U_A=U_B} = -\frac{\alpha}{1-\alpha}$$

so that by equating these two,

$$\alpha \approx \frac{q}{p+q}. \tag{3}$$

Therefore, values for r and α can be calculated by designing appropriate empirical studies that identify the relevant points on the U_A–U_B plane. Moreover, since the MRS_{AB} along the contour represents the importance of the well-being of group A relative to the well-being of group B, it will also represent the relative weights at the margin given to the well-being of the two groups. This 'equity weight' is thus calculated as

$$\mathrm{MRS}_{AB} \equiv -\frac{dU_B}{dU_A} = \frac{\partial W}{\partial U_A}\frac{\partial U_B}{\partial W} = \frac{\alpha}{(1-\alpha)}\left[\frac{U_B}{U_A}\right]^{(1+r)}. \tag{4}$$

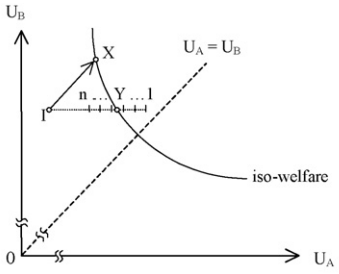
5. An empirical study

Letters inviting potential respondents to attend a one-to-one interview were sent out to 1500 individuals randomly drawn from the electoral register in three wards in York. From the 467 who agreed to take part, 140 were selected for interview based on the background characteristics they supplied in a reply slip. Of these, 130 turned up for interview. The achieved sample was broadly representative of the population of Yorkshire and Humberside in terms of sex, age, employment status, number of years of schooling and the percentage of smokers. All interviews were carried out at the University of York by three trained interviewers. Each interview consisted of a series of questions, which in total took about an hour to complete.

There were a number of versions of the questionnaire that were administered over two rounds of interviewing (full details of the study design can be found elsewhere Shaw et al. (2001)). However, the general structure of the interview was that each respondent was asked questions relating to: (1) inequalities in life expectancy at birth by social class or by sex; (2) inequalities in rates of long-term illness by social class or by smoking status; (3) inequalities in rates of childhood mortality by social class; and (4) the treatment of two groups of people, one that has taken care of their health and one that has not. The second question concerning smoking status, and the fourth question are relevant to this study. (These questions are reproduced in Appendices 1 and 2; see Dolan et al. (2002) for the other questions in the survey.) Given different versions of the questionnaire, 31 respondents answered the second question in relation to smoking status and a separate 56 answered the fourth question. We make no claims about the representativeness of this sample, but merely draw attention to the general nature of the results obtained and their ability to estimate parameters in a SWF.

Responses to the fourth question can be used to calculate α. Respondents are told that there are two groups of people in equal health. The groups are the same in all relevant respects except that those in the first group (A) have not cared for their health whilst those in the second group (B) have taken care of their health. Without an intervention, all individuals are expected to die soon, but there are not enough resources to save all. Respondents are asked to choose between two programmes: Programme 1 will save 100 lives from group A and Programme 2 will save q lives from group B. Both programmes cost the same and all saved individuals will have equal health gains. To identify the relative importance of these two programmes, respondents are offered a series of pair-wise choices between $p = 100$ and decreasing values of q. This is illustrated in Fig. 1.

The values of q used are: 100, 95, 60, 30 and 5, and a respondent is assumed to be indifferent between the two programmes at the midpoint of the last pair where Programme 1 was chosen and the first pair where Programme 2 was chosen. Values for



U_A: health of the less advantaged group

U_B: health of the more advantaged group

I: initial point

It is assumed that $\alpha = 0.5$

X: outcome offered by programme 1

the horizontal broken line: the set of options (1 to n) offered by programme 2

Y: the point at which the median respondent is indifferent between the two programmes, and thus the point through which the iso-welfare curve crosses the broken line

Fig. 2. Eliciting the value of r.

α and the resulting implied weights are presented in columns 3 and 4 in Table 1. The table shows that the median respondent is indifferent between saving the lives of 100 people from group A and saving the lives of 45 people from group B. Thus, using Eq. (3), the value of α is 0.31. The implication of applying this to Eq. (4) is that, in the absence of health inequalities, the weight given to a marginal health improvement for someone who has not cared for her health is about half (0.45) as much as that for someone who has cared for their health.

This value of α can then be applied to the responses to the question where an inequality in health exists between smokers and non-smokers, which the smokers are to some extent responsible for. This is question two, where respondents are first presented with information on the existing inequality in the prevalence rates of long-term illness amongst smokers and non-smokers. They are then asked to choose between Programme 1 that will reduce the prevalence of long-term illness by equal amounts for the two groups, and Programme 2 that is targeted at smokers. If a respondent chooses Programme 1, she is asked no further questions. If a respondent chooses Programme 2, then this means that reducing inequalities matters despite the worse off group having some responsibility over their disadvantageous situation, and so the next set of questions explores the extent to which this is so by making Programme 2 less effective until the respondent switches from Programme 1 to Programme 2. As before, it is assumed that the respondent is indifferent between the two programmes at the midpoint of the options immediately before and after switching. Thus, the exercise will lead to identifying two points on the same iso-welfare curve. This is illustrated in Fig. 2, under the $\alpha = 0.5$ assumption. When $\alpha < 0.5$, the contour will pass through the same two points, but the gradient at the 45° ray will be less steep.

The value of r can be calculated from Eq. (2), for different values of α. Table 2 presents values of r for three values of α, from the case where $\alpha = 0.5$ (i.e. both smokers and non-smokers are given the same weight) to the case where $\alpha = 0.3$ (as

Table 2
Question on limiting long-term illness in smokers and non-smokers.

Percentage without long-term illness: 95% and 67% is equivalent to 90% and . . .	Distribution of responses $n = 31$	$\alpha = 0.5$, $-\alpha/(1-\alpha) = 1.00$		$\alpha = 0.4$, $-\alpha/(1-\alpha) = 0.67$		$\alpha = 0.3$, $-\alpha/(1-\alpha) = 0.43$	
		Implied r	Implied weight	Implied r	Implied weight	Implied r	Implied weight
72% (or more)	27	−1.00	1.00	0.42	0.67	1.96	0.43
71.75%	0	−0.82	1.07	0.59	0.71	2.12	0.46
71.25%	0	−0.44	1.24	0.95	0.83	2.47	0.53
70.5%	0	0.20	1.58	1.57	1.06	3.06	0.68
69.5%	2	1.28	2.39	2.61	1.60	4.07	1.03
68.5%	1	2.87	4.40	4.17	2.93	5.59	1.88
67.5%	0	6.22	15.90	7.49	10.60	8.88	6.81
67% or less	1	Infinity	Infinity	Infinity	Infinity	Infinity	Infinity

For example, the first row indicates that there were 27 respondents who were indifferent between a situation where 95% of non-smokers and 67% of smokers have a limiting long term illness and another situation where 90% of non-smokers and 72% of smokers have a limiting long term illness, and if we assume that they are in favour of $\alpha = 0.5$, then this implies $r = -1.00$, and an implied weight for a marginal health benefit of smokers of 1.00. Further along the first row, the last two columns indicate that if we now assume that they are in favour of $\alpha = 0.3$, then this implies $r = -1.96$, and an implied weight for a marginal health benefit of smokers of 0.43.

identified from the responses to the fourth question). The implied equity weights for a marginal health improvement at the initial point (derived from Eq. (4)) are given for each value of α. When there is no concern for how health is distributed and no concern for the extent to which individuals are responsible for their health (i.e. $r = -1$, $\alpha = 0.5$), the relative weight given to smokers (and non-smokers) is one. When there is some concern for equality but more concern for responsibility, the weights given to smokers are smaller than one, but as the concern for inequality in health grows (i.e. in the lower rows), this will begin to outweigh the responsibility factor so that the weight will eventually be larger than one. From responses to this study, the relative weight given to a marginal health improvement to a smoker in poorer health relative to a non-smoker in better health could be as low as 0.43 (on the assumption that the poorer health of smokers is entirely their responsibility).

6. Discussion

The SWF specification (1) used in this study has two parameters that represent two things – the trade-off between equality and efficiency and the relative weight given to different individuals or groups. Some empirical studies have attempted to measure people's preferences regarding the former, assuming that $\alpha = 0.5$. However, there are good philosophical reasons for supposing that some inequalities (in health or whatever) are less inequitable than others. In particular, an inequality only translates into an inequity if an individual cannot be held responsible for his disadvantage. There is some empirical evidence on equality-efficiency trade-offs, but very little in relation the trade-off between equity and efficiency. In the empirical studies to date that have not distinguished between equality and equity, two people with very different preferences – one who cares a lot about inequalities but who wishes to blame the worse off for those inequalities and one who cares less about inequalities but who also blames the worse off less – might give precisely the same answer to the questions that have been asked.

In the study reported in this paper, we have tried to estimate not only the value of r, but also the value of α in the health-related SWF. The responses suggest that people who have not cared for their own health are given about half as much weight as those who have cared for their health. And, on average, respondents were unwilling to reduce inequalities in health that were due to smoking behaviour. Of course, it is very difficult to calculate precise values for α independently of r – they may be formally separable from one another but are inextricably related in any empirical investigation. And it is difficult to discern respondents' beliefs about (a) how much control individuals have over their actions, such as their smoking behaviour, and (b) the causal relationship between those actions and resulting inequalities, such as in rates of long-term illness.

There are two practical approaches in response to these challenges: one is for the researchers to impose a given level of responsibility and to ask respondents to accept this; the other (adopted in this study) is to allow respondents to bring to the exercise their own notion of the degree of responsibility. The obvious difficulties of the first approach are that it will be difficult to devise a simple and meaningful scale of responsibility and, even if this were possible, respondents may not agree with the level of responsibility set in the question. The shortcoming of the second approach is that we do not know the level of individual responsibility that each respondent had in mind. This is why, instead of eliciting the precise level of α for smokers, we elicit the value of α for those who have simply not taken care of their health and treat this as indicating the lower limit of α that can be attributable to smokers. The implication is that there is a potential mismatch between the question for r based on a specific behaviour of smoking, and the question for α based on a general and highly abstract scenario. Therefore, the results presented here should be seen to represent a lower limit on the weight given to smokers vis-à-vis non-smokers, rather than as a precise weight.

Furthermore, the sample is small and not representative. The question scenarios used do not reflect the full complexity around individual choice and behaviour, nor around the causality between individual choice and health outcomes. They only address one type of behaviour (smoking), whereas different types of behaviours may attract different preferences. The study scenarios do not allow for heterogeneity (say, in income) amongst the smokers, whilst there may be interactions between multiple relevant factors. In addition, the design only concerns the level of health outcomes as opposed to health care finance and/or health care delivery, and it is likely people's views will depend on the aspect of health (or health care) inequality.

There are at least two more general reasons for treating the results with caution. First, it is well recognised that people's preferences are to some extent constructed during the process by which they are elicited (see Rabin, 1998, for an excellent review). Whilst many of the well-known framing effects were controlled for, it is impossible to remove all possible sources of bias. For example, it is now well established that respondents may give greater weight to the losses of one group as compared to an equivalent gain to the other group (Schweitzer, 1995). Therefore, the questions were designed so that neither programme in the smoking question involved any losses, and so that neither programme was presented as representing the status quo. However, loss aversion may also be present when considering *potential* as well as actual losses from a particular reference point (Dolan and Robinson, 2001) and, if some respondents to the second question adopted the potential gains available to both groups in Programme 1 as their reference point, then Programme 2 would involve a 'loss' to the non-smokers.

Second, there are questions relating to the reliability of stated preference data, particularly of the kind gathered in this study, which asked respondents to consider their detached and unbiased preferences as citizens over benefits to other

people. As with other studies that have sought to elicit citizen-type preferences over different public policies, it is not possible to test our results against the preferences that respondents reveal in their private consumer-type behaviour. In addition, we cannot rule out the possibility that some respondents may have given what Miller refers to as 'Sunday Best' responses; that is, "the views that people think they ought to hold according to some imbibed theory as opposed to the operational beliefs that would guide them in a practical situation." (Miller, 1992) However, most respondents were willing to discriminate against those who have not cared for their health, so evidence of this would appear to be weak.

In general terms, this study has shown that, when considering inequalities in health, people seem to give weight to the extent to which individuals can be held responsible for those inequalities. It is unclear whether the same results would be found in other contexts. The study by Schokkaert and Devooght (2003) referred to above used examples of health care delivery and also of the redistribution of labour income. They found that these two contexts invoke significantly different patterns of responses regarding which inequalities should be compensated for, and how. Unfortunately, the question on health care delivery was related to *additional* expenditure whilst the question on income concerned redistribution *within* the two groups, and so the results are not strictly comparable across these two contexts. However, their results, like ours reported here, suggest that 'responsibility' matters in addition to 'inequality', and future empirical studies should take due account of this. There is certainly the need for more empirical work in the area of efficiency-equity trade-offs in health and other concepts of well-being, and the general SWF approach we have set out here represents one promising way forward.

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Appendix A. The second question on the *r* parameter

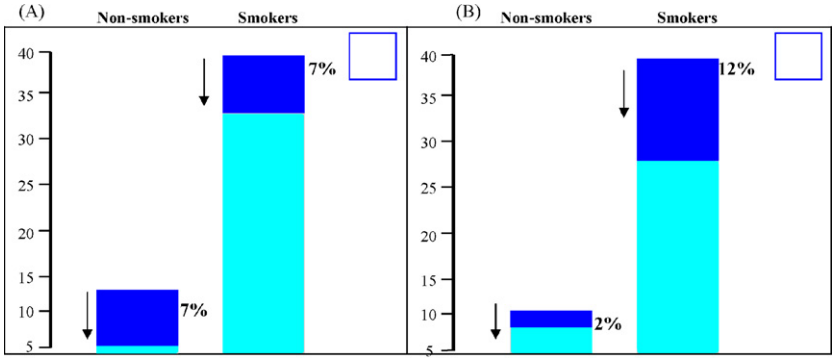
The number of people who report having a long-term illness differs between smokers and non-smokers.

In the age group 45–64, **12**% of non-smokers report long-term illness.

In the same age group, **40**% of smokers report long-term illness.

Imagine that you are asked to choose between two programmes which will reduce the percentage of people reporting long-term illness. Both programmes will cost the same. Programme A is aimed at smokers and non-smokers equally and Programme B is aimed more at smokers.

The graphs show the rates of long-term illness amongst smokers and non-smokers. The dark part shows the reduction in illness for each of the programmes.

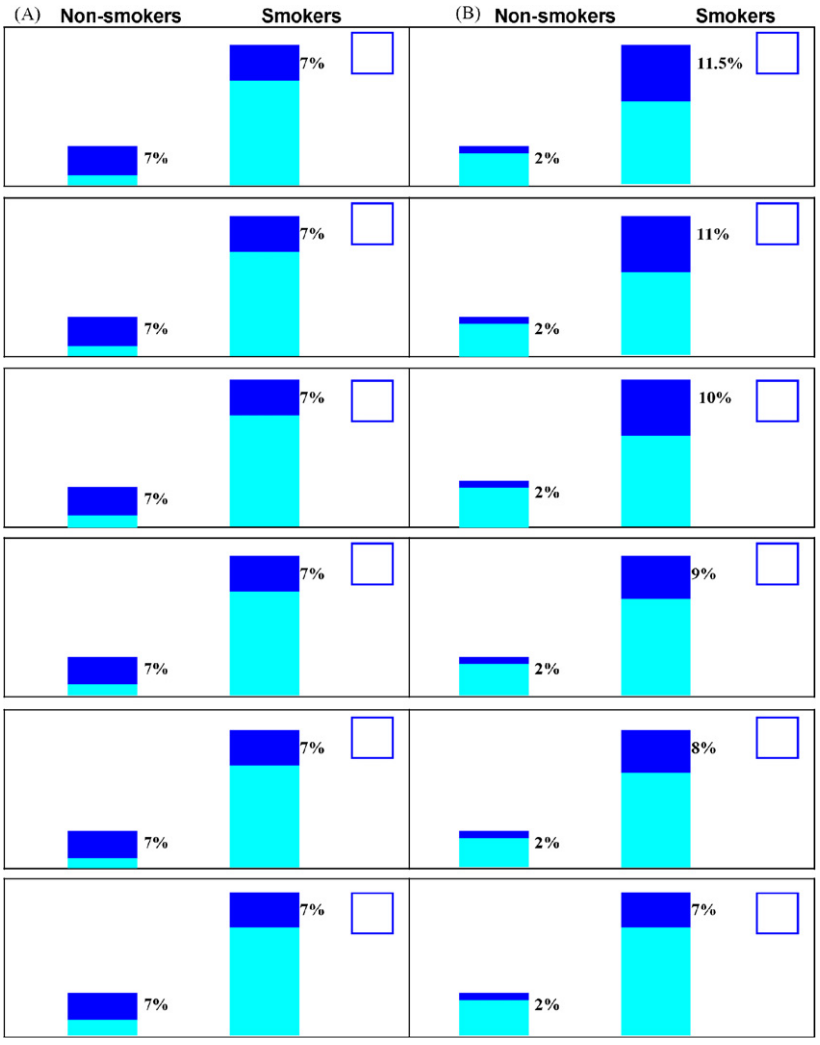


If you choose A, please go to the next question.

If you chose B, please read on.

Aiming the intervention at smokers might mean that the decrease in long-term illness is less overall.

For each of the five choices on the next page, please tick one box to indicate whether you would still choose B, or whether you would now chose A.



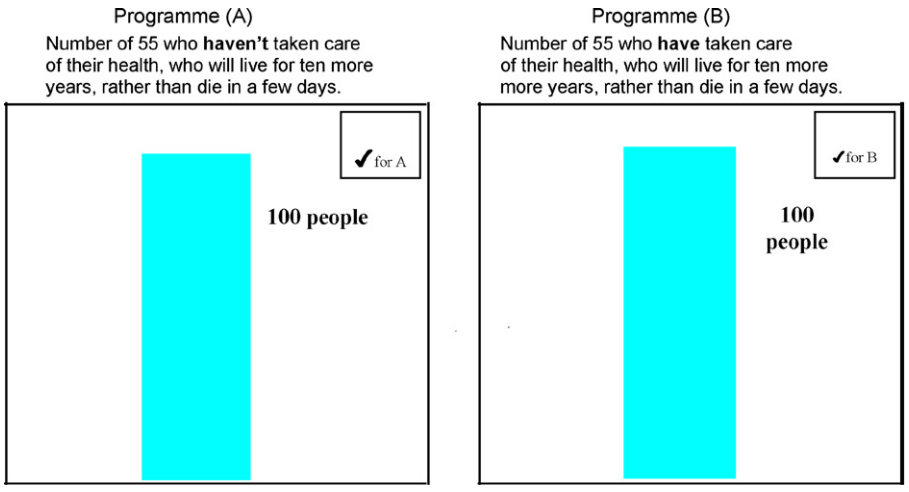
Appendix B. The fourth question on the α parameter

Imagine that you are asked to choose between two programmes which could benefit two different groups of people. Both programmes cost the same.

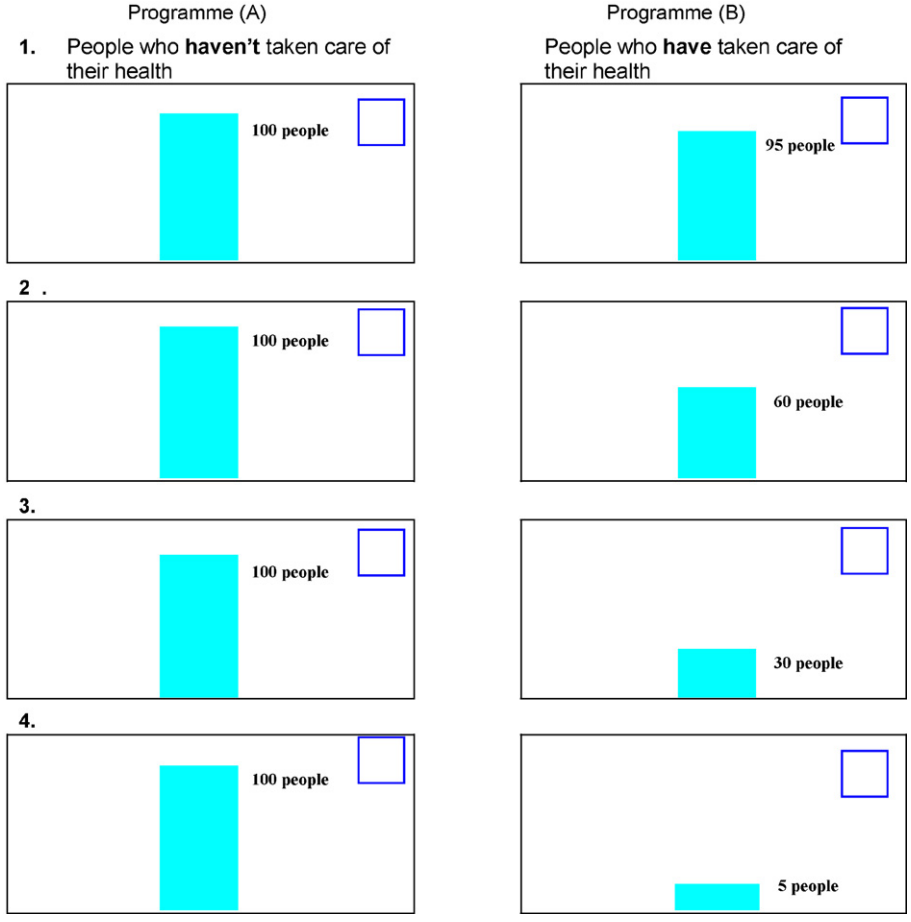
Without the intervention, patients will die within a few days but with the intervention they will live for another 10 years in good health and then die.

People in both groups are 55 years old. They are similar to one another except that those in Programme A have not taken care of their health, whilst those in Programme B have.

Please indicate whether you would choose A or B by ticking one box.



If you chose A, you have now finished.
If you chose B, please read on.
Choosing Programme B might mean that fewer people can be treated.
For each of the four choices below, please tick one box to indicate whether you would still choose B, or whether you would now choose A.



References

Amiel, Y., Cowell, F.A., 1999. Thinking about Inequality. Cambridge University Press.
Arneson, R.J., 1990. Liberalism, distributive subjectivism, and equal opportunity for welfare. Philosophy and Public Affairs 19, 158–194.
Atkinson, A.B., 1970. On the measurement of inequality. Journal of Economic Theory 2, 244–263.
Boadway, R., Bruce, N., 1984. Welfare Economics. Basil Blackwell.
Broome, J., 1991. Weighing Goods. Basil Blackwell.
Cappelen, A.W., Norheim, O.F., 2005. Responsibility in health care: a liberal egalitarian approach. Medical Ethics 31, 476–480.
Cohen, G.A., 1989. On the currency of egalitarian justice. Ethics 99, 906–944.
Culyer, A.J., 1989. The normative economics of health care finance and provision. Oxford Review of Economic Policy 5, 34–58.
Devooght, K., 2003. Measuring inequality by counting 'complaints': theory and empirics. Economics and Philosophy 19, 241–263.
Dias, P.R., Jones, A., 2007. Giving equality of opportunity a fair innings. Health Economics 16 (2), 109–112.
Dolan, P., Cookson, R., Ferguson, B., 1999. The effect of group discussions on the public's views regarding priorities in health care. British Medical Journal 318, 916–919.
Dolan, P., 1998. The measurement of individual utility and social welfare. Journal of Health Economics 17, 39–52.
Dolan, P., Tsuchiya, A., Smith, P., Shaw, R., Williams, A., 2002. Determining the parameters in a social welfare function using stated preference data: an application to health. Health Economics and Decision Science Discussion Paper Series 02/2 <http://www.shef.ac.uk/scharr/sections/heds/discussion.html> accessed August 15, 2008.
Dolan, P., Olsen, J., Menzel, P., Richardson, J., 2003. An inquiry into the different perspectives that can be used when eliciting preferences in health. Health Economics 12, 545–551.
Dolan, P., Robinson, A., 2001. The measurement of preferences over the distribution of benefits: the importance of the reference point. European Economic Review 45, 1697–1709.
Dworkin, R., 1981a. What is equality? Part 1: Equality of welfare. Philosophy and Public Affairs 10, 185–246.
Dworkin, R., 1981b. What is equality? Part 2: Equality of resources. Philosophy and Public Affairs 10, 283–345.
Fleurbaey, M., 1995a. Equal opportunity or equal social outcome? Economics and Philosophy 11, 25–55.
Fleurbaey, M., 1995b. Equality and responsibility. European Economic Review 39, 683–689.
Harsanyi, J.C., 1982. Morality and the Theory of Rational Behaviour. In: Sen, A., Williams, B. (Eds.), Utilitarianism and Beyond. Cambridge University Press.
Jowell, R., Curtice, J., Park, A., Brook, L., Thomson, K., 1998. British and European Social Attitudes: the 15th Report, Ashgate, Aldershot.
Layard, R., Walters, A.A., 1994. Allowing for Income Distribution, in: Layard, R., Glaister, S. (Eds.), Cost-Benefit Analysis. Cambridge University Press (reprinted from Layard, R., Walters, A.A. (1978), Microeconomic Theory, McGraw-Hill).
le Grand, J., 1991. Equity and Choice: An Essay in Economics and Applied Philosophy. Harper Collins.
Little, I.M.D., Mirrlees, J.A., 1974. Project Appraisal and Planning for Developing Countries. Heinemann Educational Books.
Miller, D., 1992. Distributive justice: what do people think? Ethics 102, 555–593.
Musgrave, R.A., 1959. The Theory of Public Finance. McGraw Hill.
NICE Citizens Council, 2002. Report of the First Meeting: Determining "Clinical Need" <http://www.nice.org.uk/archivedsite/newsarchive/news2002/report_of_the_first_meeting_of_the_citizens_council.jsp> accessed August 15, 2008.
Olsen, J.A., 1997. Theories of justice and their implications for priority setting in health care. Journal of Health Economics 16 (6), 625–639.
Rabin, M., 1998. Psychology and economics. Journal of Economic Literature 36, 11–46.
Rawls, J., 1971. A Theory of Justice. Harvard University Press.
Ray, A., 1984. Cost-Benefit Analysis: Issues and Methodologies. World Bank/Johns Hopkins.
Roemer, J.E., 1993. A pragmatic theory of responsibility for the egalitarian planner. Philosophy and Public Affairs 22, 146–166.
Schokkaert, E., Devooght, K., 2003. Responsibility-Sensitive Fair Compensation in Different Cultures. Social Choice and Welfare 21, 207–242.
Schweitzer, M., 1995. Multiple reference points, framing and the status quo bias in health care financing decisions. Organisational Behaviour and Human Decision Processes 63, 69–72.
Sen, A., 1987. On Ethics and Economics. Blackwell.
Shaw, R., Dolan, P., Tsuchiya, A., Williams, A., Smith, P., Burrows, R., 2001. Development of a questionnaire to elicit public preferences regarding health inequalities. Centre for Health Economics, University of York.
Wagstaff, A., 1994. Qalys and the Equity-Efficiency Tradeoff, in: Layard, A., Glaister, S. (Eds.), Cost-Benefit Analysis. Cambridge University Press (reprinted from Journal of Health Economics, 10:21–41, 1991).
Wikler, D., 2004. Personal and social responsibility for health. In: Anand, S., Peter, F., Sen, A. (Eds.), Public Health, Ethics, and Equity. Oxford University Press.