On the economic foundations of CEA. Ladies and gentlemen, take your positions!

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Abstract

There are still many ongoing debates about several aspects of the methodology of economic evaluations of health care interventions. Some of the disparities in recommendations on methodological issues may be traced back to different viewpoints on cost-effectiveness analysis (CEA) in general. Two important views are the welfarist approach, which aims at embedding CEA into traditional welfare economics, and the decision maker’s approach, which takes a broader and more pragmatic view on CEA. The focus in welfarism may be on utility while that of the decision maker’s approach may be considered to be on health. In this paper it is examined how these two views differ and how these differences may subsequently lead to debates in methodological areas. It is indicated that embedding the practical operationalisation of CEA in welfare economics seems impossible. In a strict welfarist approach it is necessary to view QALYs as being utilities, although one may question whether such an approach to QALYs is appropriate. Also, equity considerations may play an important role in cost-effectiveness analysis and these should preferably be taken into account in a way that reflects societal attitudes towards an equitable distribution of health care. These equity considerations may not always be directly related to utility or efficiency. Furthermore, both camps may prefer different methods for cost measurement in areas such as productivity costs and informal care. A better recognition of the contents and

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1. Introduction

The general methodology of economic evaluation in health care (cost-benefit analysis, but especially cost-effectiveness analysis and cost-utility analysis) and its economic foundations are increasingly becoming a matter of discussion. Recently, in the *Journal of Health Economics* for instance, there was a discussion on economic foundations of cost-effectiveness analysis (CEA) in relation to the inclusion of unrelated future health care and non-health care costs (Garber and Phelps, 1997; Meltzer, 1997; Weinstein and Manning, 1997). In addition, there is an ongoing debate on several other methodological issues, like whether and how to incorporate productivity costs (e.g., Koopmanschap et al., 1995, 1997; Brouwer et al., 1997a,b, 1998; Johannesson and Karlsson, 1997; Weinstein et al., 1997), how to incorporate equity principles in CEA (e.g., Wagstaff, 1991; Bleichrodt, 1997; Williams, 1997), how to incorporate and value informal care (e.g., Gold et al., 1996; Drummond et al., 1997; Brouwer et al., 1999) and how to discount costs and especially health effects in CEA (e.g., Gold et al., 1996; Gyrd-Hansen and Sogaard, 1998, Van Hout, 1998). Some of these debates or the lack of consensus on specific subjects may originate from the fact that divergent views on economic evaluation prevail among analysts. Weinstein et al. (1996) write that some of the disparities in the methods that investigators employ ‘...reflect divergent views on key methodological choices’. Whereas some authors prefer to see economic evaluation as founded in traditional welfare economics, others follow a more pragmatic ‘decision maker’s approach’ (DMA). Although one might claim that both approaches aim at aiding policymakers in decision making on health care services, welfarists may try to base methodological recommendations on often individualistic welfare economic models, whereas adherents of the decision maker’s approach base their recommendations on societal values and pragmatic assumptions.

Welfarists may criticize the DMA, claiming it has no theoretical framework, as it is not embedded in standard welfare economic theory. The foundation for the methodological choices within the DMA can be viewed as ‘maximizing health effects from a given budget’. In addition, the economic foundations of the welfarist approach to economic evaluation are not indisputable either. It may be

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1 See for instance Johannesson and Karlsson (1997) in their reply to the friction cost method.
questioned whether many of the often individualistic, microeconomic theoretical models for determining optimal solutions and recommendations, with their underlying assumptions and specific viewpoints, are fully valid for and instrumental to societal decision making in the health care sector.

In this paper, we will discuss the decision maker’s approach and the welfarist approach in societal economic evaluations of health care. While the main focus will be on cost-effectiveness analysis, which here includes so-called cost-utility analysis, economic evaluation will be discussed more broadly. It is indicated how these different views may lead to disparities in methodological recommendations. Some practical and theoretical viewpoints will be appraised on their usefulness and consistency. Section 2 points out the main differences between the decision maker’s and the welfarist approach. In Section 3 the divergent views these two approaches have on several methodological issues in economic evaluation are discussed. Finally, Section 4 gives a conclusion and discussion.

2. Competing views on economic evaluation

The general aim and rationale of CEA is to aid decision making in health care, with the goal of maximizing health benefits from a given budget, taking a societal perspective (Gold et al., 1996). Economic evaluation has come into fashion because it can provide a rationale for choosing certain programs over others, which is convenient when budget constraints do not enable policymakers to implement all possible health care interventions and programs. Taking a societal perspective means that all costs and health effects should be incorporated, regardless of who bears those costs or experiences the health effects. Although there may be a broad consensus on these general outlines of CEA in particular and economic evaluation in general, the subsequent operationalisation of methods shows that different views on economic evaluations may still be encountered. Welfarists may aim at making economic evaluation consistent with welfare economics, for instance using willingness to pay and CBA, while following the DMA, one may consider economic evaluation as an imperfect aid to decision making. Some may claim that welfarism in contrast to the DMA can provide guidance in methodological choices. For instance, Weinstein and Manning (1997) state that the DMA or extra-welfarism ‘provides little guidance in controversies about what should be counted in the C/E-ratio and how’. However, this view may be questioned. Taking the aim of economic evaluations to be maximizing the number of health effects with a given health care budget while considering other resource changes in society, e.g., through indirect costs, is in itself a frame for

2 See for instance Drummond et al. (1997), page 18.
analysis and this pragmatic frame may also just as well provide guidance in methodological choices. In addition, Weinstein and Manning (1997) acknowledge that conclusions derived from certain welfare economic models ‘may be unsettling to many practitioners of CEA’, for instance because ethical considerations overrule basic assumptions of welfare economics.

2.1. Welfarism

Welfarists have tried to embed economic evaluations into welfare economics. This should ensure that from a welfare economics perspective optimal choices are made in the allocation of health care funds. Also, investments in health care are considered in a framework similar to that for other allocations of scarce resources. Culyer (1991) describes this viewpoint as:

One approach in health economics, which has become the traditional one in economics as a whole, is what Sen (1977a) calls ‘welfarist’. This is very much in accord with liberal political opinion and asserts that social welfare…is a function of only individual welfare (or utility) and judgements about the superiority of one state of the world…over another are made irrespective of the non-utility aspects of each state. Moreover, the individual welfares (or utilities) are a function only of goods and services consumed (page 67).

In drawing conclusions from these models for society as a whole, one of the key assumptions underlying the aggregation of individual results is that society’s preference or utility is a perhaps weighted sum of individual’s preferences or utility. 4 Also, strict application of welfarism makes it necessary to view QALYs as utility measures. However, the practice of economic evaluation involves interpersonal comparison and aggregation of these utilities in terms of QALYs, to be able to conclude on a societal level whether or not a program is worthwhile. The question of whether such use of QALYs is fully in line with welfare economics is not easily answered (see Section 3). A possible solution that does not require the interpretation of QALYs as utilities is the use of contingent valuation, performing a cost-benefit analysis in which health effects are expressed in

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3 Harley (1998) writes: ‘The welfare economic framework…rests squarely on notions of individual utility or preference as the foundation for analysis’.

4 For instance Loomes and McKenzie (1989) write, in response to Weinstein (1986): ‘Implicit in Weinstein’s approach…seems to be the view that the values to be used in social decision making should be some aggregate of individual’s values. But this is not the only possible view: for example, the socio-political system may designate certain people to make decisions on society’s behalf, and the values these decision makers use may not be some aggregate of individual’s values, but may reflect some other notion of what represents society’s overall best interests’. (page 94)
monetary terms. Pauly (1995) even argues that in general CBA is more appropriate than CEA in the assessment of health care technologies. While within CBA subsequent aggregation and comparison of results is perhaps without problems, the fact that the results reflect ability to pay causes many to be suspicious of the consequent allocation of health care resources, especially since programs may yield health effects in specific socio-economic groups in society. Also, there are serious concerns about the reliability and consistency of WTP-answers (e.g., Pauly, 1995; Johannesson et al., 1996; Krabbe et al., 1997). In addition, there is evidence that the monetary willingness to pay per QALY gained can vary depending on the distribution of wealth and the size of risk-reduction (e.g., Jones-Lee, 1976; Viscusi, 1979; Pratt and Zeckhauser, 1996). A more pragmatic point perhaps in favour of non-monetary outcomes is that policymakers and clinicians may relate less to them than to health outcome measures such as QALYs.

A recent example of an attempt to embed cost-effectiveness analysis in welfare economic theory is given by Garber and Phelps (1997). One implication of their approach is that individual optimality holds when ‘at the margin the wage rate is equal to the willingness to pay for an additional unit of time . . . ’. This result implies a strict relationship between productive possibilities and acquiring additional life-years. No explicit societal utility is derived from the mere fact of being alive in the model, or the ‘simple’ things that make life valuable, like social contact. This type of ‘optimality’ may be unsettling, probably both for DMA-adherents and welfarists, since the WTP for less productive time, e.g., of severely handicapped, is consequently low. This demonstrates a gap between these models and real-life valuation of effects in societal decision making. From a societal perspective, ethical and perhaps also efficiency considerations may lead to opposite conclusions, favoring the health promotion of less fortunate and less productive persons in society. Basing methodological conclusions on models like these should also be performed with caution. It seems important to assess assumptions used in welfare economic models in terms of their ability to reflect the values and judgements endorsed by society or policymakers. In that respect it may be more useful to use social welfare functions rather than individualistic models, incorporating distributional considerations of wealth and health or utility (e.g., Bleichrodt, 1997; Dolan, 1998).

Note that such models do not fully fall within Culyer’s definition of welfarism, as indicated above. Equity weights may imply that individual utility may be ‘corrected’ or weighted from a societal level. Classical utilitarianism which sets social welfare equal to the sum of individual utilities is abandoned therefore. Also, one could also examine whether other traditional welfare theoretic elements, such as the Pareto-criterion, or even the ‘potential Pareto-criterion’, may be violated in such models. Moreover, as pointed out by Bleichrodt (1997) one needs an interpersonally comparable utility measure to determine which groups or persons to give priority in allocation of health care resources. As discussed in Section 3 it is questionable whether QALYs may be interpreted as being such a measure.
2.2. Extra-welfarism

The alternative view on CEA has been put forward by Culyer (1991) and Williams (1993). Culyer calls the alternative view ‘extra-welfarism’ and indicates that this view includes (or is able to include):

an important class of ‘extra’ welfare sources… the non-goods characteristics of individuals (like whether they are happy, out of pain, free to choose, physically mobile, honest). Extra-welfarism thus transcends traditional welfare: it does not exclude individual welfares from the judgements about the social state, but it does supplement them with other aspects of individuals (including even the quality of the relationships between individuals, groups and social classes).

Thus extra-welfarism ‘transcends traditional welfare’, and does not merely focus on individual utilities. More precisely, within extra-welfarism one does not necessarily have to translate all these aspects into utility-weights in order to take them into consideration in the analysis. As Hurley (1998) notes, extra-welfarism rejects ‘the conceptual foundations of the neoclassical framework, particularly the exclusive focus on utility-based notions of welfare’. Referring to Culyer he continues by stating that this framework ‘replaces utility with health as the primary outcome of interest for evaluation’.

Indeed, the extra-welfarist view is often interpreted as merely aiming to ‘maximize health from a given budget’. Culyer (1989) provides arguments for seeing health outcomes or QALYs less as utilities and more as ‘capabilities’ brought on by good health. When considering QALYs as representing health capabilities rather than utilities and assigning an equal value to these capabilities for all, one could conclude that maximization of these health outcomes or ‘health’ in general is an appropriate goal in the health care sector. Indeed, the health care budget seems to be particularly aimed at providing individuals a return to good health or to reduce suffering from bad health (while also considering relevant resource changes in other parts of society). The emphasis on health rather than utility may be justified by considering the utility of those suffering from disabilities and diseases. These individuals may perhaps live a life of fulfillment involving a level of utility higher than that of some healthy persons, but still they are entitled to health care in order to minimize their health problems. This demonstrates that the aim of providing health care may at best indirectly be utility maximization.

However, extra-welfarism should not be defined as focusing exclusively on health. Culyer (1991) states that the emphasis on health ‘is not in principle exclusive, and it seems unlikely that any extra-welfarist would assign zero weights to… factors only remotely causally linked to health’. (page 96). Therefore, non-health implications may also be incorporated in the analysis and the weights attached to the capabilities of different persons or groups in society may be
differentiated for reasons of equity or efficiency. For instance, health effects in elderly may be valued lower than those gained in children (Williams, 1997). By using a broad notion of QALYs as a preference-based health outcome measure that may be corrected for equity and efficiency considerations (see Sections 3 and 4), one might claim to try to optimize the production of health benefits from a given health care budget.

Besides more conceptual work like that of Culyer, the development of practical methodological guidelines and instruments for CEA has probably influenced our thinking about CEA as well. The way the field has developed may to some extent be a result of attitudes of for instance policymakers and researchers from different fields towards certain methodological choices. For instance, the way in which quality of life instruments have been constructed, focusing on certain aspects of human life and explicitly or implicitly excluding others, e.g., income changes, probably reflects an existing opinion on what should be measured in terms of quality of life and what not. Moreover, a preference for CEA and non-monetary measures of health effects may be seen as reflecting an implicit rejection of monetarizing health effects by policymakers and analysts.

What we shall call DMA is therefore a pragmatic common sense approach taking as its theoretical framework the aim of optimizing (weighted) health benefits from a given budget. Also, in this approach the evaluation is aimed at informing decision makers rather than prescribing what decision should be made or providing a strict ranking of all possible health care interventions. Decision makers are provided with all relevant information including non-health information and then have to make a decision by considering all different aspects. Implicit in the DMA is the general notion that society wishes to maximize a social welfare function. In this respect it is not different from traditional welfare economics. In theory, welfarism may be able to incorporate all relevant information by assigning utility impacts to all relevant changes related to a health care program and specifying a complete and acceptable social welfare function. However, adherents to the DMA may have reservations concerning the possibility to incorporate all relevant information, ethical values and interactions present in society validly in a formal societal welfare function. Also, DMA-adherents may feel health, for instance captured in terms of QALYs, to be a better maximand than utility with a given health care budget and considering other resource changes and ‘non-utility’ equity considerations, such as considerations of equal access. The manner by which all aspects are weighted and by which a decision is reached is considered to

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6 There may, however, be differences in how this social welfare function is defined and which elements should be included in it.

7 Again note that this implies an important broadening of the concept of welfarism compared to the definition of Culyer. For instance, it seems necessary to have interpersonally comparable utilities, a complete set of societal valuations of individual utilities, allowing possible violations of the (potential) Pareto-criterion et cetera.
Table 1  
Methodological issues in economic evaluation using the welfarist or the decision maker’s approach

<table>
<thead>
<tr>
<th>Issue</th>
<th>Welfarist approach</th>
<th>Decision maker’s approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operationalisation of societal perspective</td>
<td>(Weighted) aggregation of individual preferences in social welfare function</td>
<td>Societal preferences based on an implicit social welfare function</td>
</tr>
<tr>
<td>Valuation of health effects</td>
<td>Monetarisation (WTP or a statistical value of a life) or QALYs as utilities</td>
<td>In principle natural units or QALY’s (less specific interpretation)</td>
</tr>
<tr>
<td>Valuation of time/productivity costs</td>
<td>WTP for time gains/Human capital method</td>
<td>Human capital method/ Friction costs method</td>
</tr>
<tr>
<td>Valuation of informal care</td>
<td>WTP or wage rate (shadow price)</td>
<td>Shadow price or QALY?</td>
</tr>
<tr>
<td>Discounting costs</td>
<td>Long term interest rate</td>
<td>Long term interest rate</td>
</tr>
<tr>
<td>Discounting health effects</td>
<td>Average of individual time preferences for health</td>
<td>Societal/governmental time preference for health</td>
</tr>
<tr>
<td>Equity considerations</td>
<td>Equity-efficiency trade-off is possible, but is a divergence from unweighted individual utility as maximand</td>
<td>May be explicated and weighted separately</td>
</tr>
<tr>
<td>Weighting other consequences</td>
<td>Possible, but difficult to translate into utility or “overruling” individual utility</td>
<td>May be explicated and weighted separately</td>
</tr>
</tbody>
</table>
be the task of a policymaker, and weighting by analysts should be aimed at representing societal values and should be made explicit in any economic evaluation. Society may have ‘higher goals’ than purely following the individual preferences, for example by promoting health care for mentally handicapped or attaching more weight to future effects than individuals do. The inability to fully capture and weight all of these different aspects, their real utility impact and their interactions in fully outlined and defined theoretical terms and decision rules, does not lead to an inability to make decisions. Rather, the policymaker will have to weight different aspects of a program, aided by analysts.

2.3. Does it matter which side one takes?

Given the differences in both approaches, it appears that different starting points may indeed lead to different methods of analysis and consequently to different conclusions. Table 1 provides the reader with an overview of some of the areas in which the difference in viewpoint may lead or has led to differences in methodological choices, while Section 3 further discusses some of these differences and controversies.

3. Differences in methodology and viewpoint: some examples

3.1. QALYs

A first difference between welfarism and the DMA is their view on QALYs. Within the DMA QALYs may be interpreted as an imperfect, yet quite appropriate tool to operationalize health effects. These health benefits are what ultimately should be maximized from a societal perspective using the health care budget, while minding positive and adverse effects on other sectors in society and equity considerations. Culyer (1989) suggests an alternative way to interpret QALYs instead of as utilities, because ‘the idea of utility focuses too much on mental and emotional responses to commodities and characteristics of commodities and not enough on what they enable you to do’. He feels that when using QALYs we should focus more on capabilities that good health brings us rather than on utility, a move away from strict welfarism. QALYs as a measure of capabilities brought

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8 Hurley (1998) insists that ‘...as a society we have a responsibility to assess systematically the effects of policies in an attempt to ensure that they contribute towards social objectives in ways that reflect social values’.

9 One of the problems of focusing on these emotional responses is for instance adaptation (e.g., Hurley, 1998).
on by good health then in principle are a good thing to maximize with a health budget. However, some preference (or utility) indication or valuation is still needed to see which health (or capability) gain is greater than another. Only with some kind of cardinal ranking order is it possible to come to ‘the maximand which is a cardinal ‘utility’ index of health’ (Culyer, 1991). The fact that we see one health gain as greater than the other shows some societal or other preference or a normative judgement, rather than anything else. The source of this preference does, however, not necessarily have to be strict individual utility. In terms of Culyer: QALYs may indicate the extent of people’s deprivation and health care may be used to remove this.

If we look at the use and interpretation of QALYs within CEA, the attempt to fully embed CEA in welfare economics seems heroic and at this point far from accomplished. The interpretation of QALYs as utilities, needed to firmly embed CEA in welfare economics, is not indisputable if we consider how QALYs are used in CEA, i.e., not only comparing the valuation of health states for one person, but comparing interpersonally and aggregating QALYs. The comparability of utility between persons or groups of persons is problematic, yet for societal decision making unavoidable. One might differentiate between different types of utility comparison (Sen, 1977b). As indicated by Bleichrodt (1997), when comparing and aggregating QALYs and weighting QALYs/utilities for considerations of equity, one needs to assume cardinal full comparability. Many economists, however, may consider full interpersonal utility comparison off limits. People may rank their own preferences, but since the underlying amount of absolute utility is unavailable, comparing these rankings cardinally between persons seems inappropriate. Although rescaling preferences between 0 and 1 will lead to comparable rankings, obviously this does not necessarily relate to absolute amounts of utility.

Utility measurement for individuals is often based on the theory of expected utility by Von Neumann and Morgenstern (1944). Von Neumann and Morgenstern themselves use utilities in their book as means for exchange and comparison, which might tempt one to extrapolate this possibility of interpersonal comparison to QALYs. However, Von Neumann and Morgenstern in several places in their book assure that they assume a monetary notion of utility (‘a quantitative and even monetary notion of utility’), facilitating comparisons and exchange (‘substitutable and unrestrictedly transferable between the various players’). Such restrictive assumptions do not apply for QALYs, since these are not interpersonally comparable units in themselves, as the underlying absolute level of utility is unknown. Indeed, Culyer (1989) is correct to assert that an optimistic arthritic may obtain a

\[\text{As Broome (1993) states: ‘I am impressed by a point made by Culyer that using QALYs does not commit one to a narrow — he calls it ‘welfarist’ — conception of good. QALY analysis assigns values to states of health and leaves it open whether these values are determined by how people feel when in these states, by their preferences about them, or perhaps by some objective principles’.}\]
higher utility level than a healthy Calvinist convinced he is not among the chosen. Rescaling utility into numbers between zero and one hides the absolute levels. Interpersonal comparison and aggregation of QALYs can therefore not be based solely on the work of Von Neumann and Morgenstern. Interestingly, the monetary notion of utility used by Von Neumann and Morgenstern seems more related to contingent valuation such as willingness to pay and the use of CBA rather than to QALYs and CEA.

The use of two fixed endpoints (death is 0, perfect health is 1) is sometimes indicated as being a rationale for comparing between persons. If one assumes that utility is equal for all persons then one may compare the values given by different persons between these two extremes (disregarding states worse than death). One may also interpret this as meaning that the value of health is equal for all in a DMA-like approach. By in principle attaching equal values to similar health changes across persons or groups, one may add, compare and average scores. Although this procedure of assigning an equal value (in terms of utility) to every person may be considered an ethical way of dealing with health, it effectively constitutes a divergence from welfare economics. Interpersonal differences in the absolute amount of utility are ignored. Therefore, not real individual utility is the basis of the analysis, but rather a normatively attached value of health, i.e., one equal for all persons. This may be considered inconsistent with for instance the model of Garber and Phelps (1997) since productive possibilities and income now may not determine the value of the QALY which is set equal for everyone. Since it cannot be denied that certain persons or groups in society or even in a certain health program may have higher utility levels than others, utility maximization is abandoned. In addition, both interpersonal differences within ‘the health domain’ and societal preferences of improving one person’s health over that of another person are not considered in such an approach. Investigating individual trade-offs concerning health, for example with standard gamble techniques, are however still useful, not in the least for policymakers, to see how individuals come to decisions on health state changes and to find good approximations of individual’s preferences for health. It is the direct comparison of outcomes between persons and groups that should be considered with caution and we should especially be careful about how we interpret and present the results. At this point, the concept of QALYs and therewith the concept of cost-effectiveness analysis may better be categorized as an imperfect measure of health related quality of life, especially in the context of societal decision making, but may be conveniently used as an aid to decision making. This health outcome may very well indicate the ‘health possibili-

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11 Torrance (1986) for instance indicates that: ‘The central basis for this method is that the difference in utility between being dead and being healthy is set equal across people. In this way, the method is egalitarian within the health domain; that is, each individual’s health is counted equally’.

12 See Williams (1993) for a discussion on using average scores.
ties’ for reaching the optimal amount of utilities, but should not be mistaken for cardinal, interpersonally comparable utilities.

In short, at this point completely embedding QALYs as utilities and therefore CEA in welfare economic theory seems impossible for programs in which interpersonal utility comparisons are necessary. This makes the criticism that the DMA is not fully embedded in welfare economic theory rather pointless. Currently, there appears to be no complete economic foundation of cost-effectiveness analysis that is applicable to it’s practical use.

3.2. Equity

Society and policymakers may incorporate equity concerns in decisions on the allocation of health care resources. One consequence in many western European countries is the existence of public health insurance, funded by obligatory contributions, which are at least partly based on income. This should ensure equal access to basic health care for all members of a particular country. Within the health care system, the distribution of health benefits or health care is mostly related to the need of a patient and not to ability to pay. Indeed, as ability to pay therefore is often rejected as a method of distributing health care, the use of theoretical models in which an individual trades off health and wealth may be considered less appropriate to reflect real societal decision making. The trade-off between equity and efficiency in health care is important, both on an aggregated level (e.g., Van Doorslaer et al., 1993, 1997) and for specific health care programs, for example for cervical cancer screening diminishing socio-economic health differences (Koopmanschap et al., 1990). Both welfarism and the decision maker’s approach have difficulties in fully incorporating equity considerations explicitly. Hurley (1998) even considers both welfarism and extra-welfarism to have a ‘rather limited scope for accomodating equity concerns in the analysis’. One may feel that the scope for considering equity is even more limited in welfarism in which the Pareto-criterion and the initial distribution of wealth may be viewed as restricting the possibilities for redistributing health effects considerably (e.g., Rice, 1998). Also within welfarism, where the emphasis is on utility, it is again necessary to compare utility between persons and groups in order to assess which group should receive more or less weight (Bleichrodt, 1997). Moreover, if the weighting-process is not reflecting individual utility including altruistic preferences, some may consider weighting health effects as having no foundation in welfare economics (Johannesson, 1999).

If willingness to pay is used to value health effects, health care programs for people with higher socio-economic status would show higher benefits, ceteris paribus. In the case of mortality prevention, using a monetary value of a life saved may be considered equity neutral using an average value for all citizens, but this can hardly be reconciled with utility maximization principles underlying welfarism. A differentiation of the value by participation in paid work (or income) or
by utility level again may have adverse equity implications. The US Panel on Cost-Effectiveness also encountered the difficulties of incorporating equity implications in an evaluation from working with welfarist models and principles. Weinstein and Manning (1997) for instance mention that ‘…there were equity implications of the economic welfare view that they were unwilling to accept’.

Weighting results, i.e., health effects, for different persons or groups is sometimes advocated as a means to incorporate equity considerations into the analysis. An important example hereof is the fair innings principle used by Williams (e.g., 1997), but others have also investigated the equity weights one might attach to health gains in different groups and persons (e.g., Johannesson and Gerdtham, 1996; Dolan, 1998). In the recent discussion in the Journal of Health Economics between Dolan (1999) and Johannesson (1999) again a strict welfarist approach to societal decision making versus a broader opinion about the nature of concepts of fairness and how these may ‘shape the social welfare function’ is encountered. Johannesson essentially takes a classical utilitarian social welfare viewpoint, i.e., that social welfare is a sum of individual welfare. The additional element compared to the definition of welfarism provided by Culyer is that individuals are now allowed to be affected by the utility of others. On the other hand, Dolan asserts: ‘… I hypothesise that people may have preferences (for example, about social justice or fairness) that are extrinsic to individual utility’. By claiming that fairness may be something more than merely being affected by the utility levels of others in society, or extrinsic to individual utility as mentioned by Dolan, we move beyond strict welfarism. Moreover, following an approach such as that of Johannesson, one might feel to be dealing only with efficiency. Although one may therefore agree with Johannesson that Dolan’s approach of determining equity weights for gained QALYs has no theoretical foundation in welfare economics, this may sooner be the direct result of the narrow definition of social welfare used within strict welfare economics than anything else.

In the social welfare function there may be different ways of assigning weights to QALYs gained in different groups in society or to their relative opportunity of gaining QALYs (see for instance Bleichrodt, 1997). It may, however, in both views prove difficult to make all relevant weights and considerations explicit. The equity weights may differ per program, as these may be aimed at different groups in society. Furthermore, it involves not only distribution of health effects within one program, but also over different programs. In that context, besides age a priori quality adjusted life expectancy of recipients of health effects from a certain program may influence equity weights as well (Brouwer and van Hout, 1998; Waugh and Scott, 1998). Obviously, these different rationales for adjustments may interact and therefore it may prove difficult to formulate one strict decision rule. If the health care sector is aiming at producing health rather than utility, relevant

\footnote{Dolan (1999) points out that ‘altruism is an efficiency consideration’.}
equity considerations may also focus on health rather than on utility. Moreover, some equity principles may prove to be irreconcilable with the Pareto-criterion. In this respect the DMA provide analysts with more freedom to incorporate societal equity considerations in the analysis and societal preferences for health gains in certain groups that cannot be traced back to altruism.

3.3. Time costs and productivity costs

There has been a lot of debate concerning time costs and productivity costs related to absence from paid work in economic evaluations of health care. An interesting discussion in the current context is that between advocates of the human capital approach and those of the friction cost method. The former is sometimes praised for being consistent with neo-classical economic theory (e.g., Johannesson and Karlsson, 1997; Liljas, 1998). The latter however is seen as reflecting real possibilities for replacing ill and disabled persons (e.g., Koopmanschap et al., 1995, 1997). Welfarists may consider the human capital approach as being superior for its foundation in welfare economics, but adherents to a more DMA-like approach may consider the standard neo-classical models as being inappropriate to reflect economic reality, especially from a societal perspective.

The US Panel on Cost-Effectiveness in Health and Medicine (Gold et al., 1996) also discussed this issue and advocated a new approach to incorporate productivity costs in an economic evaluation, incorporating productivity losses through income changes in terms of health benefits rather than in terms of costs. Although the US Panel begins by advocating a broad societal perspective in which CEA is an aid to decision making rather than a full prescription for social choice (Weinstein and Manning, 1997), a view quite in line with the DMA, a quite restrictive individualistic welfare economic model, i.e., that of Garber and Phelps (1997), is used as a justification for their recommendation on productivity costs (Gold et al., 1996). Therefore, the societal DMA is not followed consistently, but is sometimes substituted by individualistic welfarism, which may lead to conclusions that are difficult to reconcile with the general DMA perspective on CEA. Garber and Phelps show that in their model incorporation of production losses (which are equivalent to income changes) as either effects or costs will lead to consistent results. The US Panel subsequently recommends production losses to be measured in terms of QALYs, through consideration of income by respondents. To express productivity costs in monetary terms seems to be viewed by the US Panel as a movement towards CBA (Gold et al., 1996, page 182), and since income depends partially on health income changes may be seen as health effects.

Savings in terms of reduced productivity costs may have equity implications for the results of an analysis. Inclusion of production losses and gains in economic evaluation may favour health care programs directed at employed persons over those affecting unemployed persons, since an equal reduction of illness may save more productivity costs in the former group. This situation could be easily avoided
by excluding productivity costs from economic evaluations. However, this would ignore the fact that production losses influence the scarcity of resources and hence decrease the wealth of society. To give a full picture of indirect costs one should also value lost production related to unpaid work, diminishing adverse equity consequences. Furthermore, it would be advisable to report direct and productivity costs separately and to show the possible equity implications of including indirect costs. It is the responsibility of decision makers to decide on the relative weight that they want to attach to the equity considerations, separate from the relative efficiency of interventions.

3.4. Informal care

For many chronic and lethal diseases the role of informal care is substantial and probably growing, as a consequence of the aging population. Economists agree on the fact that if informal care is a non negligible part of a specific health care program, it should be incorporated into economic evaluation as it involves the use of scarce resources. Regarding the valuation of informal care health economists are often somewhat vague. However, it appears that welfarists prefer to value informal care monetarily, using individual estimates of the opportunity costs of time (paid work, unpaid work and leisure). Mostly, this is approximated by the wage rate, assuming that the labour market is capable of equalizing the marginal value of a unit of leisure time or unpaid work and the market wage rate. If informal caregivers do not have paid work, a general age and sex specific wage rate is often used as an approximation.

Following the DMA, some analysts would simply present the amount of informal care, without a valuation, whereas others would use the actual wage rate, a reservation wage rate for those currently not working or the market wage for household work in case of unpaid work. A third possibility was suggested by Brouwer et al. (1999). They proposed to value informal care not only monetarily. In valuing the time input they suggest the friction cost method for paid work and a market price for household services as a shadow price for unpaid work. The positive or negative process utility related to the caregiving process as such should be valued by quality of life measurement. For leisure time sacrificed, Brouwer et al. does not advocate a monetary value, since the end of leisure time is not production but enjoying the pleasant things in life. Hence, they propose to value lost/gained leisure time of informal caregivers in terms of quality of life. Of course, following such a proposition again makes the result of a CEA more extensive than a simple C/E-ratio, as it is not without difficulties (if at all feasible) to combine both informal caregiver’s and patient’s quality of life. On the other hand, taking a societal viewpoint in economic evaluation does encompass considering all costs and health effects regardless of who bears these costs or who experiences those health effects. To confine this broad definition to patients only may be considered inappropriate.
3.5. Discounting

Most economists seem to agree that future costs related to a health care program should be aggregated over time using a discount rate which reflects the average return on relatively low risk investments such as long term government bonds (Drummond et al., 1997). Regarding time preference for health effects the views are more divergent. Some welfarists feel that individualistic preferences for current versus future health should be the basis for discounting effects. The available research on elicited time preference shows a wide variation in discount rates, but in general these rates turn out to be quite high: for example 19–24% per year according to Cairns (1994). Using these time preferences in economic evaluation would imply that health care programs that have some delay in producing health effects turn out to be quite unfavourable. This effect may be somewhat less when using a hyperbolic discount function, discounting the near future more than the far future (e.g., Cairns and van der Pol, 1996).

Within DMA, analysts tend more towards a discount rate for health effects set by the decision maker, reflecting societal time preference for health effects, probably correcting for myopic individual attitudes in a somewhat paternalistic way (Krahm and Gafni, 1993). Many analysts seem to choose for a 5% discount rate (equal to costs), because they are convinced by the Weinstein and Stason (1977) argument that a lower discount rate for health effects would lead to implausible results (for a discussion on the validity of this argument see Van Hout, 1998). Some may be convinced by Keeler and Cretin (1983) that using different discount rates for costs and effects leads to infinite postponing of programs. However, one may question whether this mathematically correct doom-scenario is relevant in the policy context of fixed health care budgets which have to be assigned to different programs each year. As an unfortunate consequence, analysts do not feel the need to underpin the choice for a specific discount rate for health effects. However, we expect that debate on this issue will continue in the nearby (undiscounted!) future.

If and how costs and health effects which accrue to the next generation should be discounted is a related issue. It may be the case that our concerns for the health of our children and grandchildren are not adequately reflected by standard discounting. Notwithstanding this, Johannesson and Johansson (1996) asked people to elicit individual time preferences regarding health for future generation, resulting in discount rates of up to 25%. Gyrd-Hansen and Sogaard (1998) have recently tried to reconcile the individual and the societal viewpoint in discounting, proposing a two-stage discount model, as previously discussed by Libscomb (1989). Gyrd-Hansen and Sogaard propose a combination of social interpersonal time preference and individual time preference for discounting changes in life expectancy; the former is used for discounting the health benefits from the moment of risk reduction to present time, while the latter is used for the period the program affects the individual. This combination may also be considered related to


the view that individuals may have a discount rate that they ‘use’ in their private sphere, while they want policymakers to use another discount rate for the decisions in the societal domain.

Here, again the general view on CEA may determine in which direction a solution to the problem is sought. Where welfarists may strive to improve the determination of the discount functions in individualistic behaviour, DMA-adherents may leave the choice up to decision makers or try to find some more normative decision rules reflecting society’s time preference or which may be endorsed by society (but may be ‘paternalistically’ divergent from individual discount behaviour). In the end, decision makers have to decide between different opinions on this matter and on equity between generations.

4. Discussion, conclusion and recommendation

From the above discussion one may conclude that DMA puts the decision maker in a more difficult position, as one does not dispose of a clear-cut net benefit figure as in CBA or a simple C/E-ratio involving utilities in CEA. However, one could argue that providing the decision maker with a systematic overview of societal costs, health effects, together with equity implications, quality of life of informal care and other important considerations, would provide the decision maker with the opportunity to give explicit weights to the relevant criteria. This may enhance the transparency of the decision making process. It should be admitted that this requires the decision maker to have better insight in the strengths and weaknesses of economic evaluation, its inherent normative value judgements and the limitations of its use.

Also, it may be argued that in strict welfarist research economists may receive a dominant position in research, leaving only restricted room for psychologists and physicians in describing health effects. In the DMA the health economist may be seen to inherently receive a more modest position. Health effects are not monetarised or seen as strict utility and input from other scientific fields in assessing these health effects are indispensable. For instance the burden of informal care can be modeled taking non-economic and non-utility arguments into account. Consequently, economic evaluation may get a somewhat multicriteria analysis-like character, because not all aspects of health care programs can be fitted into a C/E-ratio.

Welfarists and DMA-adherents have different ways of aiding decision makers. Whereas adherents of the DMA want to make the process of decision making in the health care sector more uniform and rational, without focusing on strict compliance with welfare economics, welfarists may consider the latter to be more important. Moreover, depending on the general viewpoint taken on CEA, different methodological choices will prevail. It is good to keep this in mind and where possible try to specify the viewpoint chosen. Welfarists may wish to reconsider the
validity of interpreting QALYs as utilities in a setting of societal decision making. If CBA is chosen as the mode of analysis the monetarisation of health benefits (through willingness to pay) has to be investigated for equity implications. In general, it should be examined whether using a societal perspective in economic evaluation can be reconciled (also in practice) with the focus on (individual) utility in welfarism and basing methodological recommendations on individualistic models. Analysts following the DMA could recognize that the results of CEA/CUA contain much more than a cost effectiveness-ratio, and also may have the form of a multicriteria analysis. If the aim is to take a societal perspective, this starting point should be pursued in all aspects of the analysis, especially those concerning time and productivity costs, quality of life and discounting. There should be closer cooperation between researchers and decision makers, in order to outline the reporting format of economic evaluations, paying attention to explicating the value judgements underlying the results.

Finally, in this paper we may have overstated the differences between the welfarist view and the DMA in order to clarify our arguments. Of course, not all differences in opinion are consequences of these divergent views on CEA. In addition, the aim of both lines of thought may not be that different, but it may be more a difference in the way in which matters are operationalized and interpreted. However, we do hope that this overview of concepts used sheds more light on the contents and origins of current controversies and disputes between health economists involved in economic evaluation of health care. In addition, we hope that this paper contributes to constructive discussions on some of the issues raised and may help to attain a more uniform methodology in CEA, so that our choices in health care may be increasingly based on a sound decision making procedure and reasoning. As Sen (1995) writes ‘While Aristotle agreed with Agathon that even God could not change the past, he did think that the future was ours to make — by basing our choices on reasoning’.

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