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A nonparametric elicitation of the equity-efficiency trade-off in cost-utility analysis

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Abstract

We performed an empirical elicitation of the equity-efficiency trade-off in cost-utility analysis using the rank-dependent quality-adjusted life-year (QALY) model, a model that includes as special cases many of the social welfare functions that have been proposed in the literature. Our elicitation method corrects for utility curvature and, therefore, our estimated equity weights are not affected by diminishing marginal utility. We observed a preference for equality in the allocation of health. The data suggest that the elicited equity weights were jointly determined by preferences for equality and by insensitivity to group size. A procedure is proposed to correct the equity weights for insensitivity to group size. Finally, we give an illustration how our method can be implemented in health policy.

JEL classification: D63; I10

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1. Introduction

The common procedure to aggregate health benefits in economic evaluations of health care is by unweighted aggregation, also referred to as quality-adjusted life-year (QALY)-

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utilitarianism. This procedure weights the health gains of each individual equally and leads to a maximization of health gains. Several authors have raised concerns about the equity implications of QALY-utilitarianism and have argued that it may be necessary to differentiate between individuals based on, for example, age, health status or previously enjoyed health (Harris, 1987; Nord, 1995; Williams, 1997; Williams and Cookson, 2000).

Empirical evidence supports these concerns and indicates that people, when choosing between different allocations of health gains, not only consider efficiency, the total amount of health gains, but also equity, the distribution of the health gains (e.g. Nord, 1993; Dolan, 1998; Abellan and Pinto, 1999). These findings suggest that it may be preferable to replace QALY-utilitarianism by some sort of equity-weighted aggregation rule. Unfortunately, the available empirical research offers little guidance as to which rule should be used and how the equity weights could be elicited.

Several authors have proposed theoretical models to incorporate equity considerations into cost-utility analysis (Wagstaff, 1991; Bleichrodt, 1997; Williams, 1997; Dolan, 1998). Both Wagstaff (1991, 1993) and Dolan (1998) proposed to use an iso-elastic social welfare function to allow for a trade-off between efficiency and equity. Within this class of social welfare functions, Dolan (1998) suggested, in particular, to use a Cobb–Douglas function. Wagstaff (1991) and Dolan (1998) did not derive the assumptions underlying their proposed social welfare functions, which complicates an assessment as to why the equity-efficiency trade-off should take the form they proposed. They did not explain either how the parameters in their social welfare functions could be assessed.

Bleichrodt (1997) proposed a multiplicative social welfare function, derived the conditions on which it depends, and showed how its equity parameter could be elicited. The range of equity concerns that the multiplicative social welfare function can address is, however, limited. Williams (1997) suggested that individuals should be weighted according to their 'fair innings', the difference between the amount of health they already enjoyed and the amount of health they are entitled to over their lifetime. Williams' proposal suggests that he had in mind some sort of weighted aggregation rule, but he did not specify what form this weighted rule should take nor did he explain how the equity weights could be elicited.

Bleichrodt et al. (2004) recently proposed a new social welfare function to incorporate equity considerations into cost-utility analysis, the rank-dependent QALY model. Their model has several desirable characteristics. First, it is consistent with several social welfare functions that have been proposed in the literature, including QALY-utilitarianism, the Rawlsian social welfare function in which all weight goes to the worst-off individual, and the Gini social welfare function, which is widely used in inequality measurement. The rank-dependent QALY model can also accommodate Williams' fair innings approach. Second, as Bleichrodt et al. (2004) showed, the rank-dependent QALY model depends on assumptions that have normative appeal. A third advantage of the model is that the elicitation of the equity weights is straightforward. Finally, the model is tractable: once the equity weights have been elicited, the model can easily be used in cost-utility analyses.

The aim of this paper is to elicit the equity weights under the rank-dependent QALY model. For reasons explained in Section 2, we used a more general model than the model proposed in Bleichrodt et al. (2004). In Bleichrodt et al. (2004), the social utility function over QALYs is linear, whereas in this paper, we allow for a nonlinear social utility function over QALYs. We refer to this extended model as the nonlinear rank-dependent QALY