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Life-cycle preferences over consumption and health: a reply to Klose

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It is common practice in health economics to evaluate medical interventions on the basis of the cost per Quality Adjusted Life Year (QALY) saved, a procedure often referred to as cost-effectiveness analysis (CEA). In Bleichrodt and Quiggin (1999), we consider when this procedure is consistent with the results of a cost-benefit analysis (CBA) in which health outcomes are valued on the basis of monetary measures of willingness to pay. We derived the necessary and sufficient conditions that health status and consumption should be constant, that consumption should be the same for all individuals, and that the utility function should be multiplicatively separable in health status and consumption.

We interpret Klose's comment as making, in several different ways, the point that the necessary and sufficient conditions derived in Bleichrodt and Quiggin (1999) are quite stringent. This point was, perhaps, not stressed sufficiently in the original paper.

Klose begins by observing that CEA and CBA may differ for a number of reasons, "because—as B&Q analysed—WTP for QALYs depends on a number of factors e.g. wealth and remaining life expectancy." Naturally, we agree. The purpose of our paper was precisely to show when CEA and CBA differ.

Klose next takes issue with our proof that, if the utility of consumption conditional on death is constant, the component $w_t(c)$ in an instantaneous utility function of the form $U = v(c)q(h_t) + w_t(c)$ must also be constant, and can therefore be normalized to zero. Noting that our initial formulation allows for nonconstant $w_t(c)$, Klose asserts that $w_t(c)$ must be nonconstant in periods when health status is better than death, and "cannot be set to zero without further argumentation." We disagree. Our formulation allows for constant and nonconstant w_t , and we prove that only the latter is consistent with our conditions. Constant w_t does not exclude a preference for higher levels of consumption. If U increases

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in consumption then the individual prefers more consumption to less. In our model, U increases in consumption, even though w_t is constant, because v increases in consumption.

Klose also discusses the role of death in QALY models. It is unclear whether Klose is claiming that the worst possible health state should be valued at q=0. We wish to emphasize that, by the proof referred to above, death must have q=0 and states worse than death must therefore yield negative utility. Our analysis implies that, if such states exist, the multiplicative form is inconsistent with increasing marginal utility of consumption. Hence, CEA and CBA cannot be consistent if there are states worse than death.

Klose's third point of criticism is, in effect, that the (implicit) assumption of constant effectiveness of medical interventions is inconsistent with empirical evidence and that constant consumption is not in line with data showing a hump shaped pattern. Again, the stringency of our conditions is emphasised.

Klose also disagrees with our implicit treatment of the lifespan *T* as a continuous variable in taking derivatives of the Lagrangian for the individual's maximization problem. We view this point as a mathematical quibble rather than a serious criticism.

For those wishing to rely on CEA as an approximation to CBA, the most promising interpretation of our results and Klose's comments is that, given multiplicative utility, the approximation may be a reasonable one for working-age adults. In general, working-age adults tend to have relatively stable health status over the medium term, and, if they are near the hump in the consumption profile, relatively stable consumption.

In summary, we thank Klose for emphasising the point that our conditions are stringent. We do not believe that his comment discloses any analytical errors in our paper.

References

Bleichrodt, H., Quiggin, I., 1999. Life-cycle preferences over consumption and health: when is cost-effectiveness analysis equivalent to cost-benefit analysis? Journal of Health Economics 18, 681–708.