



Is silence golden?

A test of the incorporation of the effects of ill-health on income and leisure in health state valuations

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Summary

The objective of the present study was to evaluate whether people include the effects of ill-health on income and leisure in quality of life valuation when the measure is silent on both. A convenience sample of 20 health professionals had to rate a health status on a visual analogue scale (VAS) without being explicitly asked to consider the effects of ill-health on income and leisure. A majority of respondents (60%) does not consider income effects and 75% does consider the effects on leisure. Explicitly asking respondents to incorporate these effects lowers the valuation. Our results indicate that whatever separation between costs and effects is preferred, using quality of life measures which are silent on income and leisure, leads to either double-counting or ignoring real costs or effects. Copyright © 2005 John Wiley & Sons, Ltd.

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Introduction

In times of increasing pressures to contain health care resource consumption economic evaluations are increasingly being conducted in order to inform whether current and new technologies represent 'value for money'. The most popular method for comparing the costs and effects of health care interventions is cost–utility analysis where the costs are expressed in monetary terms and the health outcomes as quality-adjusted life-years (QALYs). Although this distinction seems clear enough, there has been much debate as to what should be counted as costs and what should be included in the QALYs (see e.g. [1] or [2] for an overview). In particular, there is an ongoing debate as to whether productivity costs related to paid work should be counted as costs in the

numerator of the cost–effectiveness ratio or as QALYs in the denominator of the cost–effectiveness ratio. This discussion was initiated in 1996, when the US Panel on Cost–Effectiveness in Health and Medicine published its methodological recommendations on cost–effectiveness analysis [3]. The US Panel recommended that 'For the reference case analysis, health-related quality of life should be captured by an instrument that, at minimum, *implicitly* incorporates the effects of morbidity on productivity and leisure' [3, p. 306]. That is, when using a health-related quality of life instrument that is silent (i.e. not explicit) concerning the consideration of lost income and leisure, it is assumed that financial effects of ill-health have been considered by the respondent. The US Panel also recommended, that 'Morbidity costs of an intervention (its impact of productive time and

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leisure time) should be excluded from the numerator of the cost-effectiveness ratio, because it is fully captured in the denominator in the reference case' [3, p. 209]. To make matters even more complicated, direct time investment by patients in the intervention (e.g. treatment time or travel time) should be captured in monetary terms according to the US Panel [3].

These recommendations have been seriously criticised by different authors (e.g. [4,5] (and subsequent discussion [6–9])). In particular, it has been questioned whether respondents actually do include the effects of ill-health on income when answering health-related quality-of-life questions when the instrument does not explicitly ask the respondent to do so. Moreover, in the presence of social insurance and payment compensation mechanisms it is unlikely that respondents include the accurate societal impact of ill-health because individuals do not bear the full consequences of their reduced productivity [4,9]. Replacement of ill workers within society, reducing productivity costs, will also not be reflected in individual considerations. On the other hand, there is consensus that the effect of ill-health on leisure time should be captured in the QALYs. It has been argued that the concept of quality of life without the incorporation of leisure would make it a hollow concept (e.g. [5]). Moreover, some health-related quality of life instruments such as the EQ-5D explicitly ask the respondent to value their ability to perform leisure activities. The recommendations of the US Panel, however, suggest that respondents may also consider the effect of ill-health on leisure time when the question is not explicit. But empirical evidence whether respondents actually do include the effects of ill-health on leisure time when the quality of life instrument is silent on it is lacking.

In the present paper we present the results from a small study to test whether respondents include the effects of ill-health on productive time related to paid work and leisure time when the instrument is silent on both. In order to ensure a consistent and valid separation between costs and effects in economic evaluations, information on what respondents consider in health state valuations is crucial however.

Some empirical evidence

The question

A convenience sample of 20 health professionals (5 medical doctors, 2 medical researchers and 13

nurses) were administered a questionnaire that described the health status of a 30-year old male patient suffering from multiple sclerosis (MS). The described disease condition would impact the patient's ability to work or enjoy leisure time (See the appendix). However, in the questionnaire we did not explicitly ask the respondent to consider the impact the disease may have on income and leisure time. Respondents were asked to value that health status on a visual analogue scale (VAS) ranging from 0 (death or worst possible health state) to 100 (best possible health state). After answering the VAS question, respondents were asked whether the impact ill-health may have on income and leisure was included in their valuation. In case either answer was negative, respondents were explicitly asked to consider these effects in the valuation of the health state described above in an identical second VAS question. The detailed questions asked are shown in the appendix.

The answer

The answers of the 20 respondents are shown in Table 1. Twelve (60%) respondents did not consider the effects of ill-health on income whereas only 5 (25%) respondents did not consider the effects of ill-health on leisure. The different possible combinations of answers with respect to (not) incorporating leisure and income in health state valuation are shown in Table 2. The mean *ex ante* VAS score was higher among respondents who did not consider income as opposed to those who did (48.33 versus 31.25) and the Wilcoxon rank-sum test was significant ($z = 2.08$, $p = 0.038$). Furthermore, the mean *ex ante* VAS score was higher among respondents who did not consider leisure as opposed to those who did (46 versus 40) but the Wilcoxon rank-sum test was not significant ($z = 0.49$, $p = 0.63$). The mean *ex ante* VAS score of those respondents who did consider the effects of ill-health on both income and leisure was lower than the *ex post* VAS score of those respondents who did not (28.57 versus 40.61) but the Wilcoxon rank-sum test was not significant ($z = -1.89$, $p = 0.06$). Among those 13 respondents who did not consider either leisure or income when answering the first VAS question, the mean VAS of the second question was lower when they were explicitly asked to do so (mean Δ VAS was 7.85) and the Wilcoxon signed-rank test was significant

Table 1. The results of 20 respondents answering the questionnaire

Respondent	Income ^a	Leisure ^b	<i>ex ante</i> VAS	<i>ex post</i> VAS	Δ VAS
1	0	1	30	30	0
2	0	1	40	40	0
3	0	1	30	30	0
4	0	1	40	30	10
5	1	1	15		
6	1	1	20		
7	1	1	50		
8	1	1	30		
9	0	0	20	20	0
10	1	1	30		
11	1	1	25		
12	1	0	50	40	10
13	0	1	60	60	0
14	1	1	30		
15	0	0	30	28	2
16	0	1	70	50	20
17	0	0	70	50	20
18	0	0	60	40	20
19	0	1	70	60	10
20	0	1	60	50	10

^aIncome=1/0 indicates whether the respondent did/did not consider the effects of ill-health on income.

^bLeisure=1/0 indicates whether the respondent did/did not consider the effects of ill-health on leisure time.

Table 2. Combination of answers with respect to considering the effects of ill-health on leisure and income in health state valuation (20 respondents)

	Did consider income	Did not consider income
Did consider leisure	7 (35%)	8 (40%)
Did not consider leisure	1 (5%)	4 (20%)

($z = 2.73$, $p = 0.0064$). However, five respondents (25%) who did not consider income in the first VAS question did not change their VAS score in the second question.

Discussion

Before discussing the implications of our findings, we need to stress that our study was based on a small, non-representative sample and therefore some caution is warranted in using the results.

Nevertheless, the main point we wish to make, based on the results of our explorative study, is that there are clear indications that using quality of life measures that are silent on income and leisure do not ensure consistent valuation of health states across respondents. Moreover, there are clear indications that being silent does not lead to results consistent with either view on incorporating productivity costs (i.e. seeing productivity costs as effects or as costs). This holds both for adherents of the US Panel approach (since only 40% of the respondents do consider income effects and 25% do not consider leisure) as well as for those health economists who wish to see productivity costs valued in monetary terms and leisure in terms of quality of life (as 40% of the respondents do consider income and again 25% do not consider leisure) [1,10]. These figures demonstrate the need for further investigation, especially in terms of whether a more explicit instruction to respondents in health state valuations would lead to better results. Depending on whether one wishes to capture productivity costs in the numerator or the denominator of a CE ratio, this may involve, respectively, an explicit instruction to ignore income effects or to incorporate income effects. In both cases an explicit instruction to incorporate effects on leisure seems necessary.

Our results are similar to those reported by Meltzer *et al.* [11] where patients were randomised into three groups and asked TTO questions relating to blindness and back pain: the first group was given no guidance about the financial consequences of illness, the second group was asked to consider that 60% of current income would be provided as disability payments, and the third group had to consider no disability payments. In the first group only 15% were considering financial consequences of ill-health, which is less than the 40% in our sample. Furthermore, similar to our study, those in the first group who considered the effects of ill-health on income had lower TTO values than those who did not. However, there was no statistically significant difference in TTO scores between the three groups for the case of blindness but patients in the third group had a significantly lower TTO value compared to the first group for the case of back pain. Interestingly, less than 25% of patients in group three thought about the financial consequences of ill-health, which indicates that even explicit guidance does not ensure that respondents actually do include the income effects of ill-health in health state valuation [11].

It is important to stress that more explicit instruction may enhance the consistency of health state valuations across individuals and a better complementarity between costs and effects, but it does not necessarily mean that the subsequent answers will therefore be correct [12]. For instance, instructing respondents to incorporate possible income effects requires them to decide (i) whether some health state will induce income effects, (ii) how large these income effects may be and (iii) how this translates into a QALY score. It is questionable whether respondents can reasonably be expected to perform such an exercise correctly. Moreover, even then individual income losses do not necessarily coincide with societal losses. This would imply that external productivity costs (i.e. those not experienced by the individual) would need to be included as costs in the analysis. However, the separation of societal production losses into a subjective component as part of the health state valuation and an objective component in monetary terms is not straightforward, complicates rather than simplifies the analysis and may not lead to consistent results as shown in our and Meltzer's study [11].

Interestingly, in our small sample, five respondents did not consider the income effects of ill-health in the second VAS question even when they were explicitly asked to do so (the *ex post* and *ex ante* VAS scores were identical). Even if they did, the income effect was considered as minor so that it did not result in a lower valuation of the health state. Some respondents indicated that they did not include income losses due to ill-health in the second health state valuation because of social benefits which should compensate income losses. In Switzerland, for example, patients would receive disability pensions, which may prevent them from experiencing substantial income losses. Our results are thus in line with those reported by Meltzer *et al.* [11] and shed light on the same issue in a different country where social security systems are given a higher priority by the general public than seems to be the case in the USA. One would therefore expect that rather respondents in the USA would consider the financial consequences of ill-health than respondents in Switzerland but our results do not support this *a priori* expectation.

Asking people explicitly not to consider income may not necessarily yield the intended results as well. Explicitly asking respondents to ignore income effects may indeed resemble asking them

not to think of a pink elephant. Mentioning income effects, even in the context of asking respondents to ignore them, may trigger the awareness of these effects and thus influence health state valuations in undesirable ways.

In the end, what this paper tries to argue is that there is a strong indication that respondents of health state valuations do not unanimously adhere to the US Panel separation of costs and effects nor to leaving out income effects all together. Unfortunately, they do not even consistently incorporate leisure in their valuation. This is problematic, since in order to ignore double-counting or the underestimation of the impact of illness, one of either approaches needs to be adopted. More explicit instructions to respondents may improve matters. Which shows that silence is not always golden.

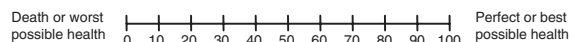
Appendix

Health status description and VAS question supplied to the respondents

Part 1 (p. 1)

Consider a 30-year old male patient who has been diagnosed with multiple sclerosis. His clinical symptoms include muscle weakness in the extremities and difficulty with coordination and balance. In addition, he exhibits paresthesias, transitory abnormal sensory feeling such as numbness or 'pins and needles'. He suffers from cognitive impairments such as difficulties with concentration, attention, memory, and judgment.

Visual Analogue Scale Question



Using the above line as a guide, how would you rate the health state described above from '0' to '100'?

Part 1 (p. 2)

Did you include in the valuation of the health state described on the previous page the impact ill-health may have on

- (A) Income ☐ YES ☐ NO
 (B) Leisure ☐ YES ☐ NO

- If you answered both A and B with YES, then please return the questionnaire

- If you answered either A or B with No, please answer the question on the next page

Part 2 (p. 3)

Identical to part 1 but with the following additional text after the second paragraph:

The patient's health condition may influence his ability to work or enjoy leisure time. Please consider these effects too when answering the visual analogue scale question.

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