



The Effect of Experience of Illness on Health State Valuations

Paul Dolan

DEPARTMENT OF ECONOMICS, UNIVERSITY OF NEWCASTLE-UPON-TYNE,
NEWCASTLE-UPON-TYNE NE1 7RU, ENGLAND

ABSTRACT. There is increasing interest in health status measurement and the relative weights that patients and the general public attach to different states of health and illness. One important question that has been raised is whether preferences differ according to the characteristics of the respondents, such as their experience of illness. The results presented in this article suggest that current health status has an important effect on the valuations attached to different health states, with those in poorer health generally giving higher valuations. Past experience of illness, on the other hand, appears to have a negligible effect on valuations. These findings pose real problems for policy makers. To the problem of whose values should count can be added the problem of when these values should count, since the results imply that different valuations may be given by the same respondent depending on how recent their experience of illness was. *J CLIN EPIDEMIOL* 49;5:551–564, 1996.

KEY WORDS. Health state measurement, visual analog scale, medical decision making

INTRODUCTION

It is becoming increasingly common for preference-based health status measures to be used in the evaluation of the outcomes of particular policies, programs, and interventions. This has led to a number of questions concerning how health-related quality of life should be described and subsequently valued. It has also led to questions concerning the aggregation of individual responses, including the question of whose values should be incorporated into an index. If it can be shown that different groups have similar preference functions, then it may not matter whose preferences are used. However, if major differences exist between groups of raters, then this poses the greatest problem for policy makers of whose values are to be given the greatest weight when it comes to assessing the outcomes of health care.

The evidence that is currently available suggests that variation among population subgroups is not explained by the different demographic characteristics of respondents, such as age, sex, or socioeconomic status [1–3]. There is, however, some evidence to suggest that experience of illness may influence respondent valuations of health states. For example, Rosser and Kind [2], from pairwise comparisons of patients, nurses, physicians, and the general public, found significant differences between medical patients and physicians and between medical patients and psychiatric patients, and Sackett and Torrance [4] reported that home dialysis patients assigned higher values to kidney dialysis than did the general public. However, Llewellyn-Thomas *et al.* [5] reported that the health status of respondents did not influence their own health state valuations, and, in a more recent study, Daly *et al.* [6] found that valuations given to mild and severe menopausal symptoms did not differ across subgroups of women who were divided on the basis of their use of hormone replacement therapy and whether they had experienced mild or severe menopausal symptoms.

The possibility that valuations differ according to illness experience has been noted by Froberg and Kane [7], who suggest that valuations from patients with a particular illness are often higher than those from patients without the illness. They go on to state that, “It appears that people with a disability manage to compensate in a way which causes them to deny its disutility.” The suggestion that those in poor health successfully compensate for it may result from an adjustment or response to “cognitive dissonance,” whereby people adjust their expectations in the light of changes in their circumstances [8]. It seems plausible that this adjustment would take place after a period of time during which individuals make the necessary adjustments to their expectations. This period of time would vary according to the individual and the type and severity of illness. It would also depend on the extent to which the individual has control over his or her own health; if this is low, an individual may reduce dissonance and feelings of distress by concluding that it is not all that important to be in good health [9].

Therefore, higher valuations might only be expected from those respondents who have a chronic condition and who have known about the nature of that condition for some time. Valuations similar to those of the general public might be expected from those with acute conditions since they have neither the time nor the inclination to make the necessary cognitive adjustments. Although a detailed discussion of why valuations may differ is beyond the scope of this article, it seems plausible that explanations such as those outlined above would be more applicable to severe states of illness, for which the “incentives” for cognitive adjustments would appear to be greatest.

The evidence currently available on the issue of whether health state valuations are influenced by illness experience is at best patchy. The results that do exist are based largely on (1) small numbers of observations, which may obscure differences between subgroups, and (2) condition-specific measures, results that may not be reproduced if a generic measure of health status is used. This article is an attempt to redress the imbalance in the literature and to shed light on an issue of great relevance to policy makers. The null hypothesis tested

Address correspondence to: Paul Dolan, Department of Economics, University of Newcastle-Upon-Tyne, Newcastle-Upon-Tyne NE1 7RU, England.

Accepted for publication on 6 April 1995.

is that those respondents with present¹ or past experience of illness give valuations to health states that are no different from those given by respondents without such experience.

METHODS

The EuroQol Instrument

The analysis in this article uses data from two studies undertaken by the Measurement and Valuation of Health (MVH) Group at the Centre for Health Economics, University of York, York, England. The group has been actively involved in the development of the EuroQol classification, a multidimensional measure of health-related quality of life [10]. As part of that developmental work, the MVH Group set up a series of studies to examine specific methodological issues. The EuroQol has been deployed in all these studies.

The Lay Concepts Study

The first data set was obtained as part of a wider study of how the general public view health and illness and what to them constitutes the salient features of health-related quality of life. Self-completion questionnaires were administered during face-to-face interviews conducted with a quota sample of disabled adults aged 18 to 25 years and their carers, recruited through support agencies. A corresponding group of individuals matched by age and sex (referred to hereafter as the disabled control group and carer control group, respectively) was also selected. In addition, a random sample was drawn from the community using electoral registers, thus yielding a total of five subgroups. The field work was carried out in Dudley, Walsall, and Wolverhampton, England in 1988. The questionnaire utilized the original six-dimensional form of the EuroQol classification (see Appendix A). Health states are described by combining one statement from each of these dimensions to produce a state of health identified by a six-digit code, e.g., 211111 describes the state in which a person is unable to walk without a stick, crutch, or walking frame but has no problems on any of the other dimensions.

The Frome Study

The second data set consisted of responses to a postal survey of patients registered with a large general practice in Frome, Somerset, England. The study, carried out in 1991, was designed to address a number of methodological issues, including the relative importance attached to energy and tiredness and the effect of changing the way in which EuroQol states are described, hence a number of different questionnaire variants were administered. The computerized practice list provided a means of identifying individuals by name and address. Each selected patient received a copy of one of the questionnaire variants together with an introductory letter from the senior partner in the practice. A reply-paid envelope was also included to facilitate the return of completed questionnaires. The questionnaire was similar to that used in the Lay Concepts study but utilized a revised five-dimensional version of the EuroQol classification,

which combines main and leisure activities into usual activities and makes all dimensions comprise three levels (see Appendix A). Health states are again described by combining one statement from each of these dimensions, in this case to produce a state of health identified by a five-digit code, e.g., 11123 describes the state in which a person has no problems with walking about, self-care, or usual activities but is in moderate pain or discomfort and is extremely anxious or depressed.

The differences within Frome were that two of the questionnaires (D and E) had an additional energy/tiredness dimension comprising two levels: "not tired or lacking in energy" (level 1) and "tired or lacking in energy" (level 2). In addition, in questionnaires A, B, and D level 2 of the mobility dimension was described as "unable to walk without a stick, crutch, or walking frame" whereas in C and E it was described as "some problems in walking about."

The Questionnaires

A standard format is used for all forms of the EuroQol questionnaire and is based on two main sections. The first of these is designed to record self-rated health status. This is achieved by asking respondents to describe their own health by indicating their level of problem on each of the EuroQol dimensions, and to value their own health on a 20-cm visual analog scale (VAS) with 100 ("best imaginable health state") and 0 ("worst imaginable health state") as end points (see Appendix A). The second section of the questionnaire is concerned with the valuation of a set of 16 composite EuroQol health states on an identical VAS. This set covers a broad range of health states and always contains the logically "best" health state (with no problems on any dimension) and logically "worst" health state (with extreme problems on all dimensions). Respondents are asked to imagine themselves being in each health state for 1 year (they are told what happens thereafter is not known and should not be taken into account) and to draw a line from the box containing the state to the point (i.e., score) on the VAS that indicates how good or bad they consider the state to be. Appendix B contains one (of two) pages of the valuation task together with the instructions given to respondents. Finally, respondents are asked a number of background questions, including whether they had ever experienced serious illness; in themselves, in their family, or in caring for others. Thus, a rich data source existed, providing the opportunity to investigate the effects of a respondent's experience of illness on their health state valuations.

Data Analysis

Each group of respondents in the Lay Concepts data was analyzed separately since the five subsamples differed with respect to their background characteristics, not least in their experience of illness. The Frome study used five variants of the EuroQol questionnaire and, since each questionnaire differed slightly, each questionnaire was also analyzed separately.

For all subsamples respondents with experience of illness were separated from those without such experience. Respondent experience of illness could be identified in five different ways: (1) those who describe their own health as anything other than good on at least one of the dimensions, (2) those who value their own health on the VAS below the median,² (3) those who report experience

¹Essentially, it is possible to measure present health status in two ways. One way is to ask respondents to indicate their level of dysfunction across a number of different aspects, or dimensions, of health. There are now many instruments for describing health, which differ greatly in terms of complexity and the dimensions that they cover. The other way is to ask respondents to attach a numerical score to their health so that a lower score indicates worse health. There are a number of different methods that can be used to elicit this valuation.

²All Frome subsamples had a median of 85 and although some subsamples of the Lay Concepts data had medians marginally below this score, separating all the respondents on this basis introduced no bias.

TABLE 1. Lay Concepts: Percentage of respondents

| Criterion | General population (<i>n</i> = 197) | Disabled (<i>n</i> = 87) | Disabled control (<i>n</i> = 92) | Carer (<i>n</i> = 93) | Carer control (<i>n</i> = 111) |
|--------------------------------|---|------------------------------|--------------------------------------|---------------------------|------------------------------------|
| Description of current health: | | | | | |
| 111111 | 68.6 | 12.0 | 82.2 | 61.8 | 69.7 |
| Other | 31.4 | 88.0 | 17.8 | 39.2 | 30.3 |
| Valuation of current health: | | | | | |
| ≥85 | 44.1 | 43.4 | 46.7 | 54.3 | 51.4 |
| ≤85 | 55.9 | 56.6 | 53.3 | 45.7 | 48.6 |
| Serious illness in self: | | | | | |
| No | 75.7 | 31.0 | 89.5 | 72.8 | 76.6 |
| Yes | 24.3 | 69.0 | 10.5 | 17.2 | 23.4 |
| Serious illness in family: | | | | | |
| No | 42.9 | 43.2 | 50.0 | 89.7 | 59.8 |
| Yes | 57.1 | 56.8 | 50.0 | 10.3 | 40.2 |
| Serious illness in others: | | | | | |
| No | 60.0 | 93.2 | 79.1 | 14.8 | 47.2 |
| Yes | 40.0 | 6.8 | 20.9 | 85.2 | 52.8 |
| Any serious illness: | | | | | |
| No | 34.4 | 19.4 | 46.0 | 5.3 | 26.0 |
| Yes | 65.6 | 80.6 | 54.0 | 94.7 | 74.0 |

TABLE 2. Frome: Percentage of respondents

| Criterion | Questionnaire variant | | | | |
|--------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | A (<i>n</i> = 122) | B (<i>n</i> = 126) | C (<i>n</i> = 122) | D (<i>n</i> = 105) | E (<i>n</i> = 126) |
| Description of current health: | | | | | |
| 111111 | 58.0 | 58.8 | 48.3 | 47.5 | 41.9 |
| Other | 42.0 | 41.2 | 51.7 | 52.5 | 58.1 |
| Valuation of current health: | | | | | |
| ≥85 | 56.2 | 55.3 | 51.3 | 48.5 | 51.6 |
| ≤85 | 43.8 | 44.7 | 48.7 | 51.5 | 48.4 |
| Serious illness in self: | | | | | |
| No | 73.8 | 71.2 | 70.5 | 74.5 | 67.6 |
| Yes | 26.2 | 28.8 | 29.5 | 25.5 | 32.4 |
| Serious illness in family: | | | | | |
| No | 27.9 | 38.0 | 28.7 | 28.7 | 29.6 |
| Yes | 72.1 | 62.0 | 71.3 | 71.3 | 70.4 |
| Serious illness in others: | | | | | |
| No | 72.1 | 62.0 | 62.1 | 60.3 | 60.4 |
| Yes | 27.9 | 38.0 | 37.9 | 39.7 | 39.6 |
| Any serious illness: | | | | | |
| No | 22.9 | 37.9 | 23.7 | 24.0 | 28.4 |
| Yes | 77.1 | 64.1 | 76.3 | 76.0 | 71.6 |

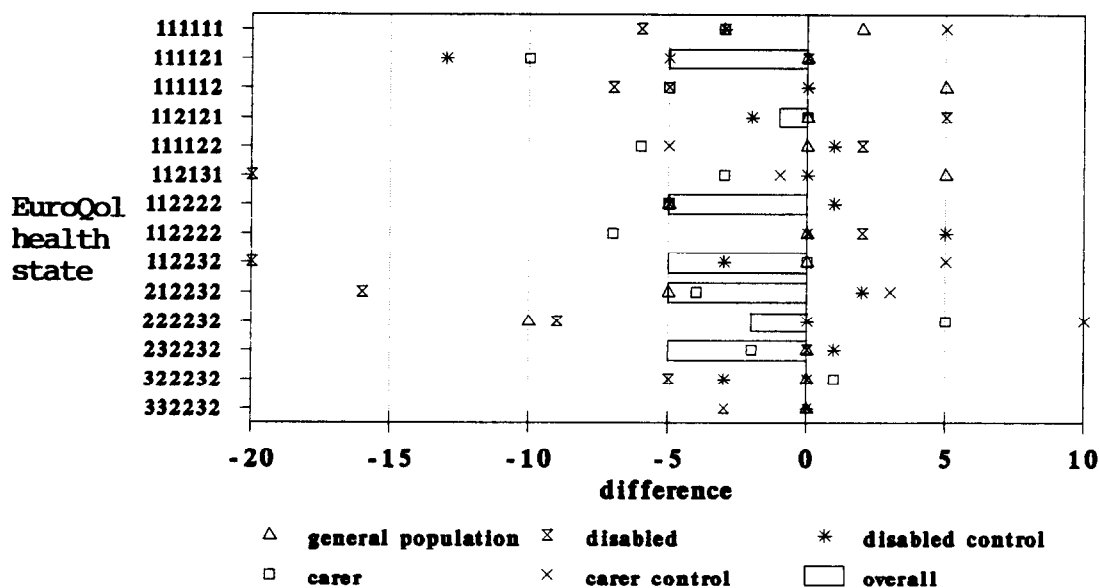
of serious illness in themselves, (4) those who report experience of serious illness in their family, and (5) those who report experience of serious illness in caring for others. Tables 1 and 2 show the percentage of respondents that fall into each of these categories,³ together with the percentage of respondents who have any past experi-

ence of illness (i.e., those reporting experience of illness in one or more of the categories labelled (3), (4) and (5) above.

Because the distribution of health state valuations was highly skewed (as evidenced by the results of Kolmogorov–Smirnov tests), the nonparametric Mann–Whitney U test was used to test whether the valuations of those with illness experience are significantly⁴ dif-

³It will be evident from Tables 1 and 2 that the number of respondents in the disabled (carer) control group is not identical to the number of respondents in the disabled (carer) group. This is because controls were matched with potential (as opposed to actual) respondents. Thus, differences in the numbers of respondents in comparable subgroups results from differential response rates in the subgroups.

⁴Throughout this article significance is measured at the 1% level. Given the sample sizes in the Lay Concepts and Frome studies, this level of significance implies that the median value of one group is at least five points on the VAS above or below that of the other group.



The difference is the median of those in state 111111 minus the median of those not in 111111

FIGURE 1. Effect of description of health (Lay Concepts study).

ferent from those without illness experience. Because of the nonnormality of the distributions and to reduce the impact of outliers on aggregate values, the median was chosen as the most appropriate measure of central tendency.

In addition, an assessment is made of whether the range⁵ of health state valuations a respondent gives can also be related to their illness experience. In other words, experience of illness may systematically affect the scores given to the "best" and "worst" health states and, by implication, may affect perceptions of the best and worst imaginable health states. Finally, chi-square tests are used to determine whether those with experience of illness differ with respect to other characteristics.

The results are presented graphically as the difference (for each state) between the values of those with and without experience of illness. This is calculated as the median value of those without illness experience minus the median value of those with illness experience. Thus, a difference of zero (or close to zero) for the majority of states is required for the null hypothesis to be accepted. To assess the "overall" impact of illness experience on valuations, the results when all questionnaire variants within each study are pooled are also shown.

RESULTS

The Influence of Illness Experience on Valuations

Figures 1 and 2 show the effect that respondents' description of their own health has on the valuations of hypothetical health states. Although there are few significant differences, the general pattern to emerge, particularly from the Frome data, is that those describing their health as "poor" have higher health state valuations than those

describing their health as "good" (i.e., most differences are negative). The biggest differences between these groups of respondents in the Lay Concepts data are observed in the disabled group. Figures 3 and 4 show the effect of respondents' valuation of their own health on valuations. For the more severe states, in the Lay Concepts data there is little difference in valuations according to how respondents value their health but in the Frome data, those valuing their health as "poor" assign higher valuations to such states. For the less severe states, data from both studies (particularly the Frome data) show that those valuing their health as "poor" assign lower valuations to these states. In other words, it appears that the impact on the valuations of less severe states is different when respondents are divided according to the description of their health than when they are divided according to the valuation of their health.

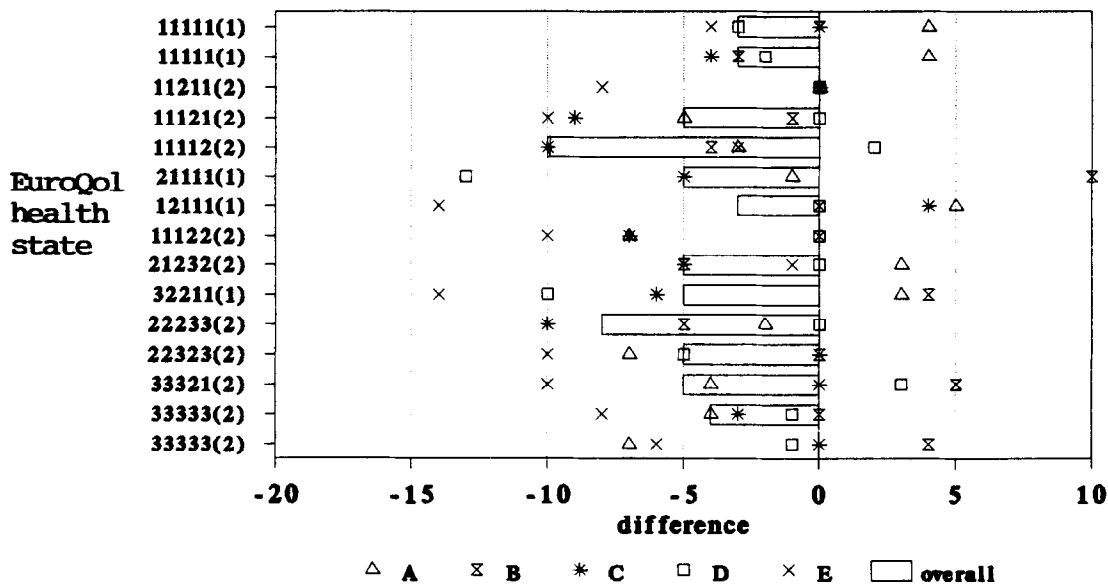
Analysis of whether differences exist between the valuations of those with and without experience of illness in themselves, their family, or in others showed that in only 9 of a possible 435 cases was a significant difference found. Even when respondents were separated according to whether they had any past experience of illness, a significant difference is found in only 5% of comparisons.

The Influence of Illness Experience on the Range of Valuations Used

The results presented above indicate that, at least for the Frome data, those valuing their own health as "poor" assign higher values to the severe states and lower values to the mild states than those valuing their own health as "good." This indicates that the range of values used by those with a low self-rated health status is less than the range of values used by those with a high self-rated health status.

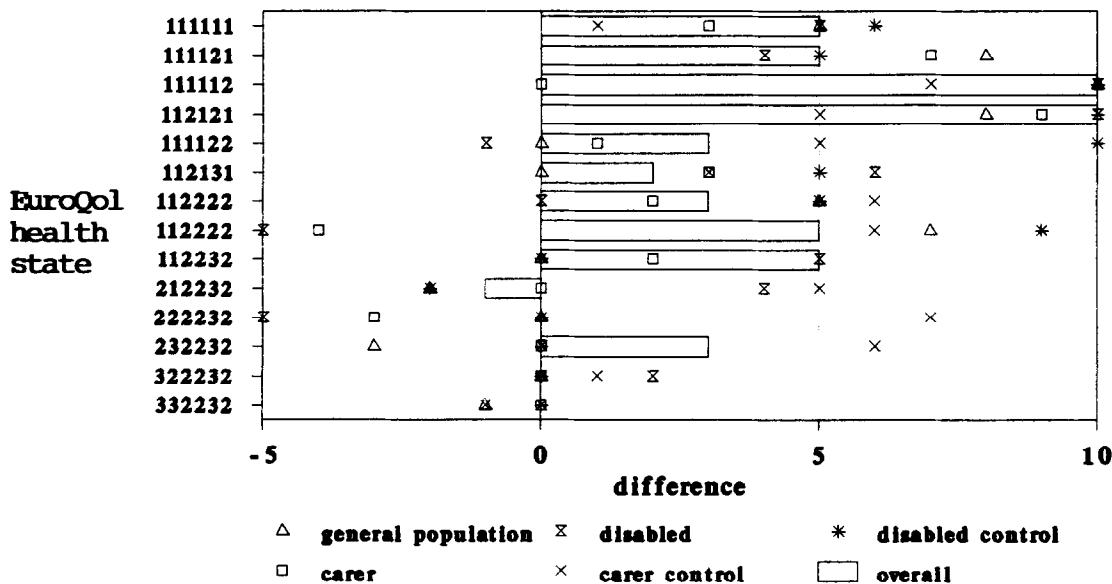
Figures 5 and 6 show the median range of values used according to how respondents describe and value their health. It appears that how respondents describe their health has little effect on the range of values they use but those valuing their health as "poor" have a

⁵This is calculated for each respondent as the highest value they give minus the lowest value they give. For the vast majority of respondents this will be the value they give to the 11111 state minus the value they give to the 332232 state or the 33333 state, depending on whether they were a respondent to the Lay Concepts or Frome Study, respectively.



The difference is the median of those in state 111111 minus the median of those not in 111111

FIGURE 2. Effect of description of health (Frome study).



The difference is the median of those valuing their health above 85 minus those below 85

FIGURE 3. Effect of valuation of health (Lay Concepts study).

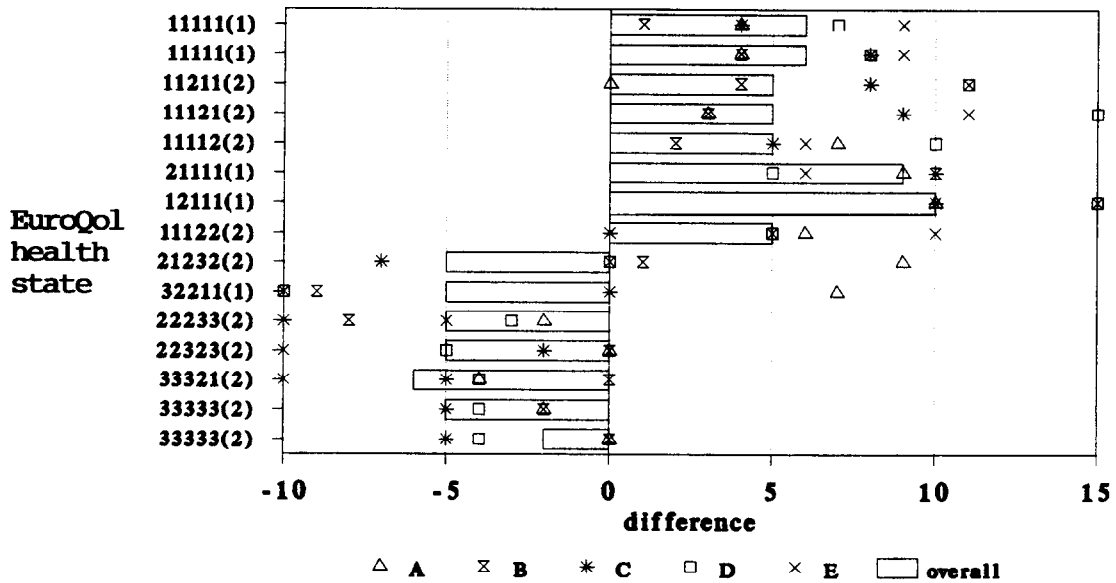
significantly narrower spread of values than those valuing their health as “good.” Although this “bunching” is caused by those with a low self-rated health status giving lower valuations to the top state and higher valuations to the bottom state, the difference is most marked at the top end. In other words, there is more of a reluctance for those who perceive themselves to be in poor health to use the top end of the scale.

Controlling for Related Variables

There are likely to be some background characteristics that are related to experience of illness; most obviously, that experience of

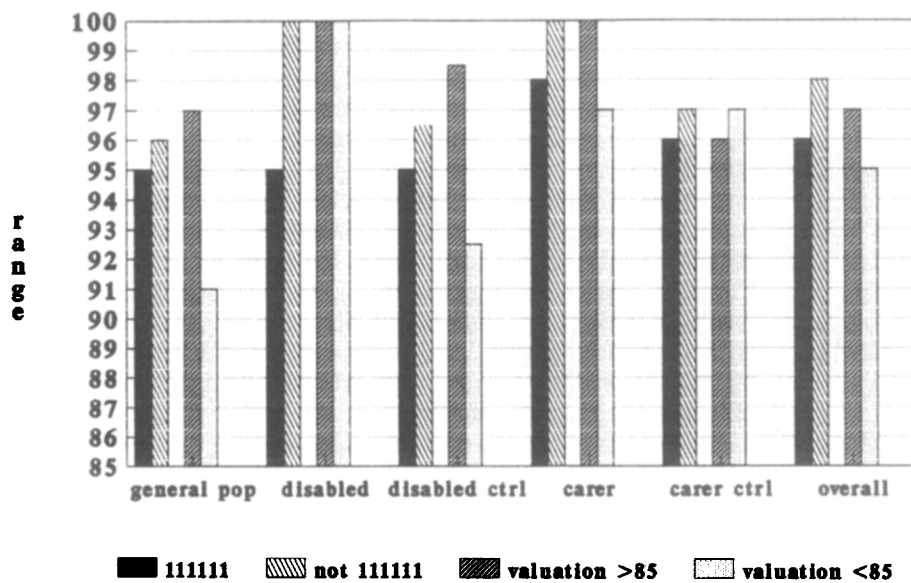
illness is a function of age. It is possible that some of these interactions are leading to incorrect conclusions about the effect of illness experience alone. After dividing the Lay Concepts and Frome data into three age groups⁶ (those aged 35 years or under, those aged 36–59, and those aged 60 or over), the results of (Pearson) chi-square tests show that those who are currently in good health (as described

⁶Because of the smaller number of respondents in each group (particularly in the Lay Concepts data, where there were no respondents aged over 25 in the disabled and disabled control groups and no respondents aged under 40 in the carer and carer control groups), the data in both studies were pooled for this analysis.



The difference is the median of those valuing their health above 85 minus those below 85

FIGURE 4. Effect of valuation of health (Frome study).



A range is calculated for each respondent as the highest value they give minus the lowest value they give

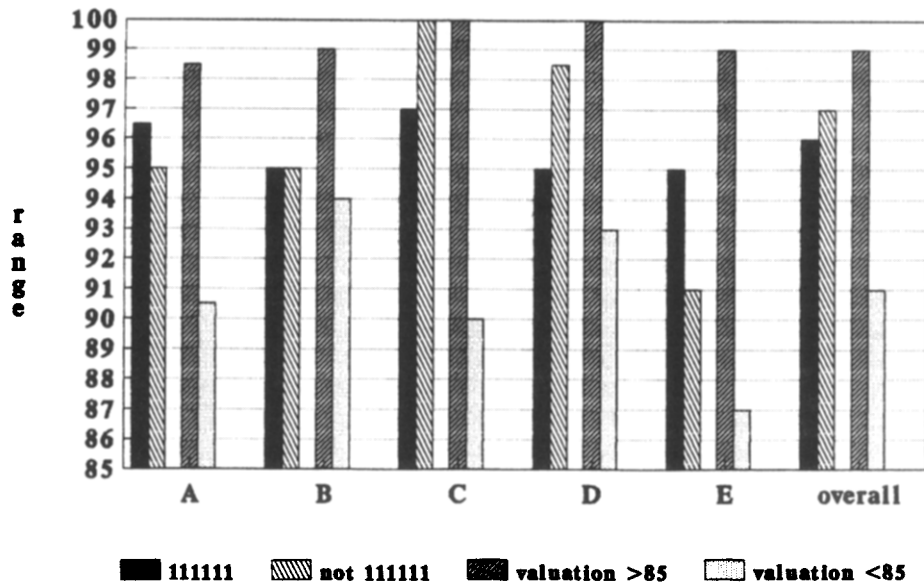
FIGURE 5. Median range of valuations (Lay Concepts study).

on the EuroQol descriptive system or as valued on the VAS) and/or those with no past experience of serious illness are more likely to be younger.

To control for the effect of age, the same Mann-Whitney U tests were carried out on each of the three age groups separately. After controlling for age, past experience of serious illness (as defined according to self, family, others, or any) still has a negligible effect on health state valuations. The findings with respect to the impact of experience of illness on the range of valuations used also remain unchanged; a narrower range is used by those valuing their health

as “poor,” and again the bunching is predominantly caused by a reluctance of such people to use the top of the scale.

Figure 7 shows the effect that respondents’ description of their health has on valuations within each age group. It can be seen that for 16-to 59-year-olds, those describing their health as “poor” have higher valuations, particularly in the Frome data, i.e., the same findings as before. However, a different pattern is observed in the oldest age group, where those describing their health as “poor” give lower valuations to the less severe states in both studies (although, like the other age groups, they give lower valuations to the more severe



A range is calculated for each respondent as the highest value they give minus the lowest value they give

FIGURE 6. Median range of valuations (Frome study).

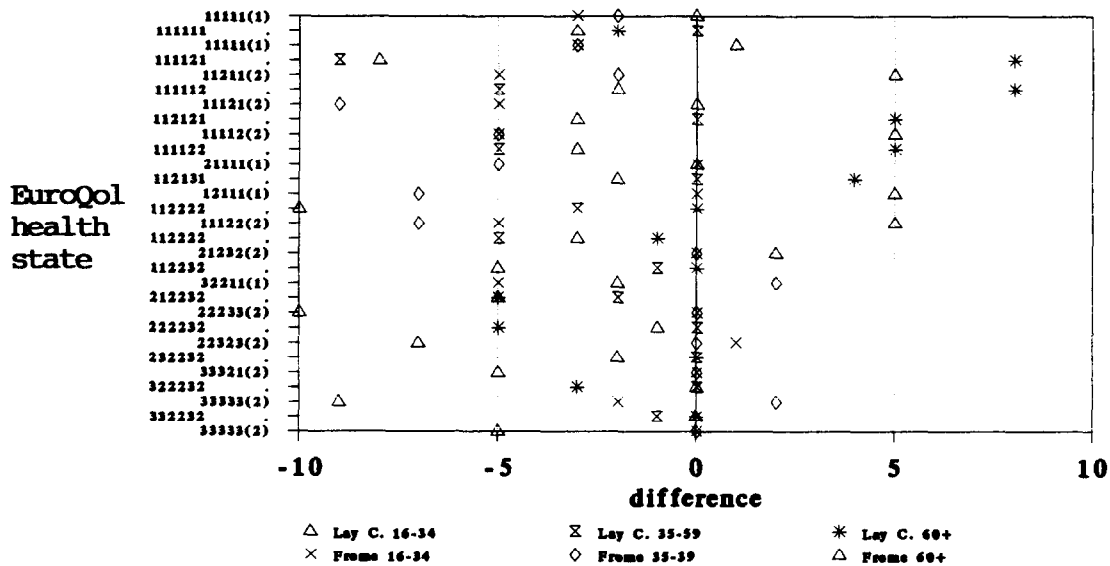


FIGURE 7. Effect of description of health, controlling for age (Lay Concepts and Frome studies).

states). Figure 8 shows the effect of respondents' valuation of their health on valuations after controlling for age. The earlier finding that those valuing their health as "poor" give higher valuations to less severe states and lower valuations to more severe states still holds.

Different Measures of Current Health Status

The results presented above suggest that those who describe their health as "good" and those who value their health as "good" are not exactly the same people. Tables 3 and 4 show the numbers of respondents who fall into two "extreme" groups: (1) those that de-

scribe their health as "poor" yet have a self-rated health score that is in the upper quartile of valuations and (2) those that describe their health as "good" yet have a self-rated health score that is in the lower quartile of valuations. From the Lay Concepts data in Table 3, it can be seen that those in the former group are predominantly in the disabled group while those in the latter are predominantly in the disabled control group.

DISCUSSION

This article has been primarily concerned with testing the null hypothesis that experience of illness has no effect on health state valu-

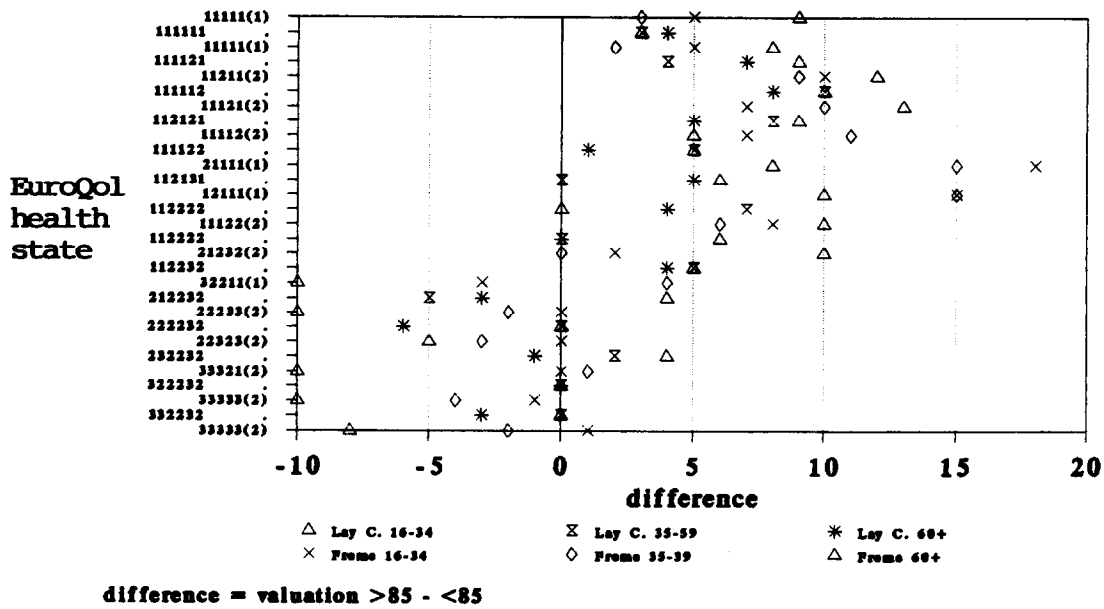


FIGURE 8. Effect of valuation of health, controlling for age (Lay Concepts and Frome studies).

ations when using the visual analog scale method. This hypothesis is rejected for current experience of illness as defined by the respondents' description of their health and instead support is lent to the alternative hypothesis that current poor health results in higher health state valuations. This might be termed *valuation shift*. Past experience of serious illness is found to have a less powerful effect, leading to the conclusion that as experience of illness becomes more remote, its effect on health state valuations becomes less. This conclusion would lend support to the notion that people respond to "cognitive dissonance"; once an individual experiences illness they adjust to it after some delay and hence perceive that illness to be less severe than others might, and if this illness is one from which they recover, they, again after some delay, revert back to having preferences similar to those that they held before.

However, when current health status is defined according to the respondents' valuation of their health, different patterns emerge. Low self-rated health status, on average, results in higher valuations of the more severe states but lower valuations of the less severe states. The results from the analysis of ranges reinforced this effect. It is not clear what causes this *valuation compression* but two possible explanations are suggested. The first, the "real" argument, that those

with a low self-rated health score genuinely compress their valuations, is based on the premise that the valuation of their own health is also genuine. In other words, those with a low value for their health are currently in poor health. Given this assumption, it may be that respondents use their own health as a "reference point" for subsequent valuations, hence the compression from the top. The second, the "artificial" argument, is based on the premise that some respondents are reluctant to use the entire VAS when valuing their own and other health states. Thus, there may be little difference in actual current health status between those valuing their own health as "poor" or as "good"; the difference is caused primarily by respondents' differential use of the anchor points on the VAS. It is impossible to tell from these data what the relative weights attached to each of these explanations should be and there is certainly a need for more qualitative research here.

Most of the results discussed here remain after controlling for age; the interesting exception is that when respondents in the 60 years and over age group are divided according to their description of their health, those in "poor" health give lower valuations to less severe states while, in accordance with other age groups, giving higher val-

TABLE 3. Lay Concepts: Outliers in distribution of respondents by own health^a

| Criterion | General population | | Disabled control | Carer control | |
|-----------------------------------|--------------------|---------|------------------|---------------|---------|
| | Disabled | | | Carer | control |
| Health description: Not 111111 | | | | | |
| Health valuation: >90 | 8 (4) | 22 (25) | 1 (1) | 6 (6) | 8 (7) |
| Health description: 111111 | | | | | |
| Health valuation: <75 | 14 (7) | 0 | 19 (21) | 4 (4) | 0 |

^aFigures in parentheses are the percentage of respondents from that particular subgroup.

TABLE 4. Frome: Outliers in distribution of respondents by own health^a

| Criterion | Questionnaire variant | | | | |
|-----------------------------------|-----------------------|---------|---------|---------|---------|
| | A | B | C | D | E |
| Health description: Not 111111 | | | | | |
| Health valuation: >90 | 7 (6) | 14 (11) | 17 (14) | 15 (14) | 20 (16) |
| Health description: 111111 | | | | | |
| Health valuation: <75 | 5 (4) | 5 (4) | 1 (1) | 3 (3) | 4 (3) |

^aFigures in parentheses are the percentage of respondents from that particular subgroup.

uations to more severe states. In other words, the effect of respondents' description of their health in the oldest age group is the same as the effect of respondents' valuation of their health in all age groups. Reasons for this are unclear.

This article has shown that those people who describe their health as "poor" are not exactly the same people who value it as such. Looking at where the differences between description and valuation are most marked lends further support to the "alternative" hypothesis that those in what others may perceive to be "poor" health place a relatively high value on their own health since they have adjusted their life styles and expectations to take account of their condition. This may be particularly true of young disabled men and women, since one-quarter of this group of respondents describe their health as "poor" yet value it as "good." Conversely, young people who describe themselves as "healthy" on the EuroQol may be reluctant to value their health near the top of the VAS because they have high expectations about what being in the "best imaginable health state" involves. This may be evidenced by the fact that more than one-fifth of respondents in the disabled control group describe their health as "good" yet value it as "poor."

This article can also contribute to the debate concerning the validity of the different methods used to value health states. In essence, a measure is valid if it accurately reflects the concept or phenomenon it claims to measure. Strictly speaking, this does not apply to health state valuations since there is no independent "objective" way to establish what such values are supposed to be. However, the validity of valuation methods can be assessed by examining the extent to which predicted relationships between valuations and respondents' background characteristics are upheld. This is referred to as *discriminant validity* [11]. If a relationship between experience of illness and health state valuations can be established, then it will be possible to use this in assessing the discriminant validity of the different valuation methods.

The conclusion of this article, that experience of illness affects health state valuations, runs counter to that of Froberg and Kane [12], who in their review of the literature to 1988 state that "at this time, reports of no differences among rater groups outweigh those showing significant differences," although they readily admit that "problems due to variability within groups and low statistical power may be obscuring differences." The large samples relative to some earlier studies may indeed be the reason why differences between population subgroups have been detected in this study. Of course, it should be stressed that there is still much variability *within* the subgroups analyzed in this article but it is important that such differences do not detract from the variability *between* subgroups that is reported. There is little doubt that there is need for future research to address both of these issues.

There is increasing recognition of the importance of health status measures in the evaluation of health outcomes. However, since health state valuations are shown to differ according to experience of illness, the issue that arises is whose preferences should be used. It could be argued that it is appropriate to weight more heavily the preferences of those most directly affected by a particular policy or intervention. However, there are also grounds for supporting the notion that, since the general public pay for health care, their preferences should be given greatest weight in the resource allocation process. Clearly this is a political, not a scientific, decision but empirical

evidence of the kind presented in this article can highlight the implications of the choices made. For example, if the values of healthy members of the public are used, then the severity of dysfunctional health states may be overestimated. Conversely, if values elicited from those who are currently in poor health, such as patients undergoing treatment, are used, then less importance may be attached to the degree of severity.

How the impact of valuation shift will manifest itself when an instrument is used consecutively to quantify the relative changes in health status is unclear. For example, transition from a low-rated severe state to a low-rated mild state (as based on the values of "healthy" people) may be no different from the transition from a high-rated severe state to a high-rated mild state (as based on the values of "ill" people). The impact of valuation compression, however, is clearer. If the views of "healthy" people are used, the transition from a low-rated severe state to a high-rated mild state will be greater than if the views of "ill" people are used, where the transition is from a high-rated severe state to a low-rated mild state. This may have important implications for resource allocation decisions. The decision-maker's problems are not made any easier by the fact that this article shows it to be entirely plausible for respondents' health state valuations to change as their experience of illness becomes more remote. Therefore, to the problem of whose values should count can be added the problem of when these values should count.

The support of the Department of Health via the Centre for Health Economics at the University of York, is gratefully acknowledged. The author thanks Claire Cudex, Paul Kind, Tremor Sheldon, and Alan Williams at the Centre for Health Economics for their helpful comments on earlier drafts of this article. The comments of two anonymous referees are also gratefully acknowledged.

References

1. Carter WB, Bobbitt RA, Bergner M, Gibson BS. Validation of interval scaling; the sickness impact profile. *Health Service Res* 1976; 11(4): 516-528.
2. Rosser R, Kind P. A scale of evaluations of states of illness: Is there a social consensus? *Int J Epidemiol* 1978; 7: 347-358.
3. Kaplan RM, Bush JW, Berry CC. The reliability, stability and generalisability of a health status index. *Social Statistics Section. Am Stat Assoc Proceedings* 1978; 704-709.
4. Sackett DL, Torrance GW. The utility of different health states as perceived by the general public. *J Chron Dis* 1978; 31: 697-704.
5. Llewellyn-Thomas H, Sutherland HJ, Tibshirani R, Ciampi A, Till JE, Boyd NF. Describing health states: Methodologic issues in obtaining values for health states. *Med Care* 1984; 22: 543-552.
6. Daly E, Gray A, Barlow D, McPherson K, Roche M, Vessey M. Measuring the impact of menopausal symptoms on quality of life. *Br Med J* 1993; 307: 836-840.
7. Froberg DG, Kane RL. Methodology for measuring health state preferences. IV. Progress and a research agenda. *J Clin Epidemiol* 1989; 7: 675-685.
8. Festinger L. *A Theory of Cognitive Dissonance*. Stanford University Press, Stanford, California, 1957.
9. Rothbaum F, Weisz JR, Snyder SS. Changing the world and changing the self: A two-process model of perceived control. *J Personality Social Psychol* 1982; 42: 5-37.
10. The EuroQol Group. EuroQol—a new facility for the measurement of health-related quality of life. *Health Policy* 1990; 16: 199-208.
11. Guyatt G, Patrick D, Feeny D. Glossary. *Controlled Clin Trials* 1991; 12: 274S-280S.
12. Froberg DG, Kane RL. Methodology for measuring health state preferences. III. Population and context effects. *J Clin Epidemiol* 1989; 6: 585-592.

APPENDIX A

1. The 6-dimension EuroQol Classification used in the Lay Concepts Study

By placing a tick (thus ✓) in at least one box in each group below, please indicate which statements best describe your own health state today.

Group 1

- : I have no problems in walking about 1
- : I am unable to walk without a stick, crutch or walking frame 2
- : I am confined to bed 3

Group 2

- : I have no problems with self-care 1
- : I am unable to dress myself 2
- : I am unable to feed myself 3

Group 3

- : I am able to perform my main activity (e.g. work, study, housework) 1
- : I am unable to perform my main activity 2

Group 4

- : I am able to pursue family and leisure activities 1
- : I am unable to pursue family and leisure activities 2

Group 5

- : I have no pain or discomfort 1
- : I have moderate pain or discomfort 2
- : I have extreme pain or discomfort 3

Group 6

- : I am not anxious or depressed 1
- : I am anxious or depressed 2

For convenience each composite health state has a six-digit code number relating to the relevant level of each dimension, with the dimensions always listed in the order given above. Thus, 211111 means

- 2 Unable to walk without a stick, crutch or walking frame
- 1 No problems with self-care
- 1 Able to perform main activity
- 1 Able to pursue family and leisure activities
- 1 No pain or discomfort
- 1 Not anxious or depressed

APPENDIX A CONTINUED.

2. The 5-dimension EurQol Classification used in the Frome Study

By placing a tick (thus ✓) in one box in each group below, please indicate which statements best describe your own health state today.

Mobility

- : I have no problems in walking about
- : I have some problems in walking about
- : I am confined to bed

| | |
|--|---|
| | 1 |
| | 2 |
| | 3 |

Self-Care

- : I have no problems with self-care
- : I have some problems washing or dressing myself
- : I am unable to wash or dress myself

| | |
|--|---|
| | 1 |
| | 2 |
| | 3 |

Usual Activities

- : I have no problems with performing my usual activities (e.g. work, study, housework, family or leisure activities)
- : I have some problems with performing my usual activities
- : I am unable to perform my usual activities

| | |
|--|---|
| | 1 |
| | 2 |
| | 3 |

Pain/Discomfort

- : I have no pain or discomfort
- : I have moderate pain or discomfort
- : I have extreme pain or discomfort

| | |
|--|---|
| | 1 |
| | 2 |
| | 3 |

Anxiety/Depression

- : I am not anxious or depressed
- : I am moderately anxious or depressed
- : I am extremely anxious or depressed

| | |
|--|---|
| | 1 |
| | 2 |
| | 3 |

 For convenience, each composite health state has a five-digit code number relating to the relevant level of each dimension, with the dimensions always listed in the order given above. Thus, 11123 means

- 1 No problems in walking about
- 1 No problems with self-care
- 1 No problems with performing usual activities
- 2 Moderate pain or discomfort
- 3 Extremely anxious or depressed

APPENDIX A CONTINUED.

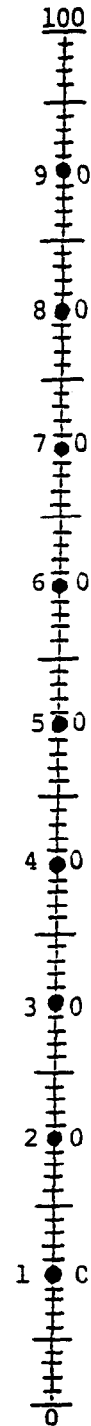
3. **Valuation of Current Health State - Lay Concepts and Frome**

To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked by 100 and the worst state you can imagine is marked by 0.

We would like you to indicate on this scale how good or bad is your own health today, in your opinion. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your current health state is.

Your own health state today

Best imaginable health state



Worst Imaginable health state

APPENDIX B

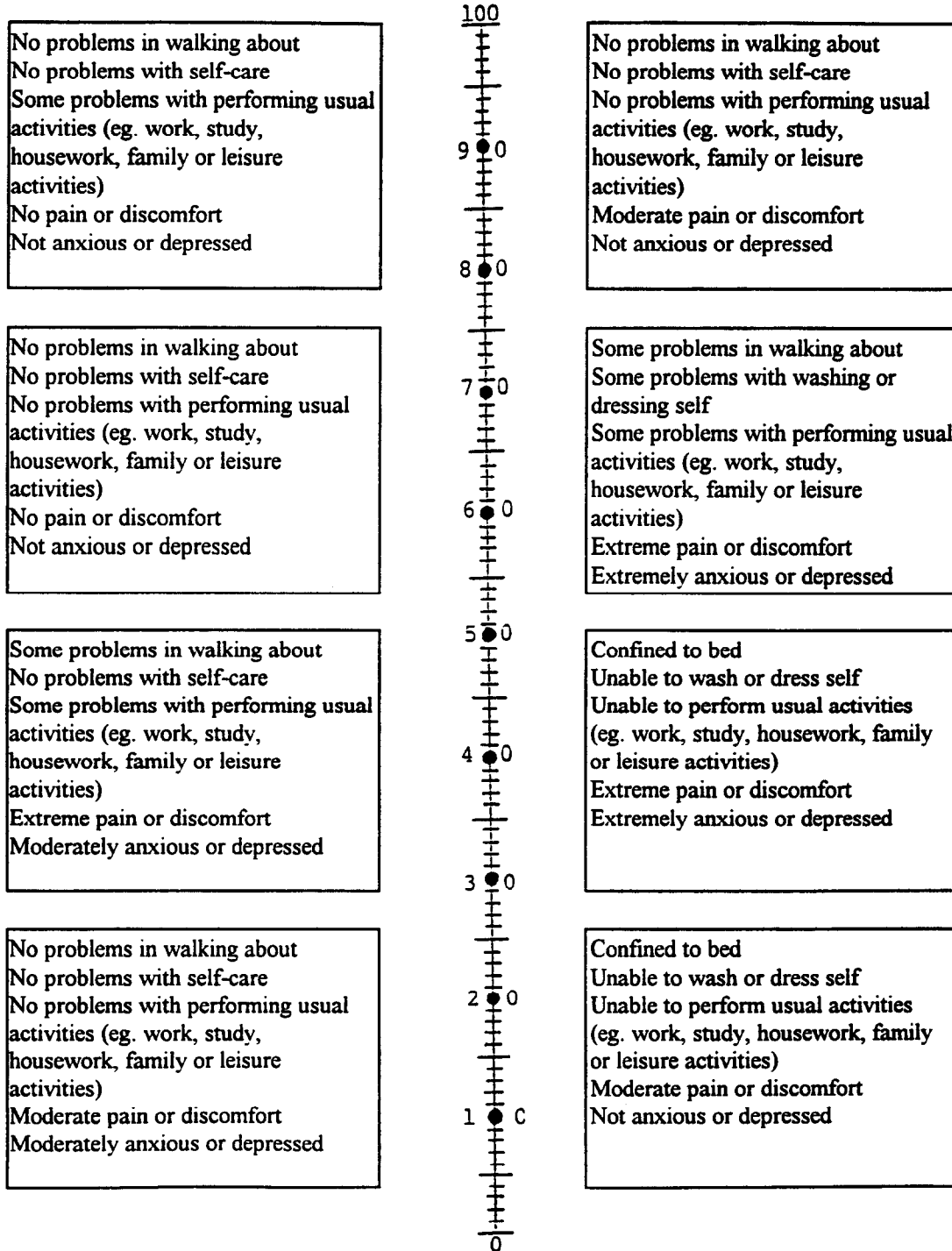
1. *Instructions given to respondents on how to value composite health states.*

- We now want to consider some other health states.
- Remember, we want you to indicate how good or bad each of these states would be for a person like you.
- They are described, on either side of the scale on the page opposite
- When thinking about each health state imagine that it will last for one year. What happens after that is not known and should not be taken into account.
- Please draw one line from each box to whichever point on the scale indicates how good or bad the state described in that box is.
- It does not matter if your lines cross each other.

APPENDIX B CONTINUED.

2. *One of the pages of states valued in the Frome study*

Best imaginable health state



Worst imaginable health state