



## How does NICE value health?

Decisions about which conditions and treatments to prioritise are never easy.

**Paul Dolan and colleagues** argue that they should be based on people's experiences rather than on what people think they might feel

Valuing the relative benefits of different treatments helps us to allocate scarce health-care resources to where they do the most good. The National Institute for Health and Clinical Excellence (NICE) advises on the cost effectiveness of treatments and recommends that health benefits should be valued in terms of gains in quality adjusted life years (QALYs). This approach assigns a value between 0 (for death) and 1 (for full health) to each health state and then multiplies that value by how long the state lasts. It makes good sense to value health benefits by accounting for duration in this way.

We do, however, have serious concerns about NICE's recommendations for the "quality adjustment" part of the QALY. NICE suggests asking members of the general public to think about how many years of life they would be willing to trade to avoid different states of health. The trouble is that these hypothetical preferences often bear lit-

tle relation to the real experiences of those in the health states. This article offers an alternative means of valuation that could help direct resources to treatments in proportion to the real suffering they alleviate.

### Valuing health the NICE way

There are three questions in valuing the Q in the QALY: what is to be valued; how is it to be valued; and who is to value it? "What" refers to the dimensions of quality of life under consideration. To compare a wide range of conditions, NICE recommends using a generic measure and it prefers the EQ-5D, which describes health in terms of three levels of severity for each of five dimensions (mobility, self care, usual activities, pain or discomfort, and anxiety or depression). This generates 243 ( $3^5$ ) possible states of health. Each state is defined by a five number code, from 11111 to 33333. So, 11121 describes a health state with moder-

ate pain or discomfort (level 2 of the fourth dimension) but no problems (level 1) for the other four dimensions.

"How" health states are valued refers to the ways in which they are expressed on a 0-1 scale. NICE recommends valuation methods that determine how strongly one state is preferred to another, and it favours the time trade-off. This requires respondents to consider how many years of life in full health,  $x$ , are equivalent to a longer time,  $t$ , in a poor health state. If full health is assigned a value of 1, then the value of the poor health state is taken to be  $x/t$ . With regard to "who" values health states, NICE has a strong preference for asking the public to imagine it rather than asking patients experiencing it.

An analysis of the time trade-off responses of around 3000 members of the UK general population was used to assign an average tariff value for each of the 243 EQ-5D health

states.<sup>1</sup> NICE recommends that patients describe their health using the EQ-5D and then uses the tariff values to determine the number of QALYs gained from any change in health state as a result of treatment.

So, an individual with moderate pain (such as, from postherpetic neuralgia) might be in health state 11121, which has a tariff value of 0.8. Treatment with a new drug that takes the person to full health will generate 0.20 QALYs for each year that benefit lasted—for example, one QALY over five years.

### Problems with the NICE approach

It is not clear why health technology assessments should privilege the five dimensions of health in the EQ-5D, why they should privilege how strongly people prefer one state to the next, and why they should privilege the preferences of the general public. There is no good basis for giving special status to the EQ-5D, particularly when other dimensions of health may affect patients as much as those in the EQ-5D. Fatigue, for example, does not seem to be adequately covered by the EQ-5D and has been shown to be a significant and independent determinant of wellbeing.<sup>2</sup> Moreover, the EQ-5D does not capture the benefits of treatment experienced by the families and carers of patients.

The need for simple descriptions of health arises out of the reliance on preference based valuation methods since respondents need to be asked to value something simple, but preference based methods like the time trade-off are problematic. Consider two theoretical EQ-5D health states: one with moderate pain or discomfort alone (state 11121) and one with moderate anxiety or depression alone (state 11112). New data we have recently gathered in the US from 1173 respondents show that the average time trade-off value for those in moderate pain or discomfort is 0.88 and the average value for those with moderate anxiety or depression is 0.91.<sup>3</sup> The UK population value is 0.80 for moderate pain or discomfort and 0.85 for moderate anxiety or depression.<sup>1</sup>

The lower values from the public are consistent with much of the evidence.<sup>4</sup> They mean that, all else equal, the QALY gain from taking patients from either of these states to full health would be greater using public rather than patient values. The difference

between public and patient preferences is a challenge for policy makers and has been the subject of some debate.<sup>5</sup>

This debate, however, misses the more fundamental point that strength of preference itself is often a poor guide to actual experience. In particular, there are good reasons and evidence to show that public and patients' valuations will not correctly predict the degree to which health states will actually affect them.<sup>6</sup> For the public considering moderate pain or discomfort, for example, it is difficult not to imagine that the pain will dominate their lives. In fact, this is not likely to be the case, especially over time. Similarly, patients with health problems who are asked to imagine having these problems alleviated will inevitably focus on what life is like when they are attending to their health state. Pain or discomfort is seen as worse than anxiety or depression when the public and patients think about those states, and this bears out other evidence.<sup>7</sup>

Preferences are therefore problematic from whomever they are elicited. A further problem with preferences elicited from the general public is that the responses will largely reflect immediate emotional reactions to the particular health state. Severe health states are likely to evoke fear, and this goes a long way towards explaining why the UK general population considers one third of the 243 EQ-5D health states, on average, to be worse than death.<sup>1</sup>

Of course, policy makers may wish to devote resources to those states that people fear the most, but accounting for fear is quite separate from accounting for the real losses from a given health state.

Time trade-off valuations conflate our fears about experiencing poor health with our assessments of how our lives will be affected by poor health.

### An alternative approach

Against this background, it can be argued that what really defines the impact of a health state is the degree to which we attend to that state in the experience of our lives. This requires more direct measures of the experiences associated with different health states. In essence, individuals (patients, carers, relatives, etc) would initially be asked to rate their overall wellbeing without drawing attention to specific aspects of their life, such as their health.

One way to achieve this is by measuring

their subjective wellbeing, which is a broad category that includes assessments of happiness and life satisfaction (box).<sup>8</sup> Individuals would then be asked to describe their health in some way. Subjective wellbeing and health state could be assessed at key stages to show the effect of treatment. Subjective wellbeing could also be assessed before treatment to show its effects on treatment outcomes—for example, people with high subjective wellbeing have been shown to be less likely to get ill and to recover more quickly when exposed to a virus.<sup>9</sup>

Individuals would also be asked to provide information on other factors known to be associated with subjective wellbeing (income, marital status, etc). By controlling for these other factors, it is possible to estimate the effect that different health states have on subjective wellbeing. Statistical analyses to determine the relative weights attached to factors that affect subjective wellbeing may provide more meaningful data than relying on what an individual thinks these weights should be when they focus attention on them.

There are several ways to measure subjective wellbeing—for instance, in terms of mood and in terms of evaluations of life.<sup>6</sup> In our recent US study, for example, we asked respondents about their mood yesterday (happy, sad, worried, etc) on a seven point scale and also to evaluate their life on an 11 point “ladder of life.”<sup>3</sup> Rather unsurprisingly, those in moderate pain or discomfort were in better moods than those with moderate anxiety or depression. There was also a significant difference, however, between the ladder of life scores of the two groups: 7.8 for those with moderate pain or discomfort and 6.9 for those with moderate anxiety or depression. Since the ladder asks about the best and worst possible lives (the bottom rung of the ladder (0) is the worst possible life and the top rung of the ladder (10) is the best possible life imaginable), it is not obvious that responses will be affected by mood. Although we cannot make grand claims for our results, since they are cross sectional and not causal, they suggest that people consider depression worse than pain when rating in terms of subjective wellbeing rather than in terms of trade-offs and preferences.

### Discussion

To the extent that our preferences are based on predictions about how things will affect our experiences, we are often guilty of “miswanting”—that is, we do not want things in proportion to how much we will enjoy them.<sup>10</sup> The time trade-off evalua-

#### Subjective wellbeing

- Subjective wellbeing is an umbrella term for how we think and feel about life
- It is usually measured in terms of day to day moods or by global assessments of life, such as life satisfaction or the ladder of life
- One of the most important determinants of subjective wellbeing is health, especially mental health, alongside having a partner, a job, and lots of social contact

tions favoured by NICE—like any set of preferences from any set of respondents—are affected by miswanting because of a focusing effect that can be summed up by the maxim, “Nothing in life is quite as important as you think it is while you are thinking about it.”<sup>11</sup>

We suggest that subjective wellbeing offers a more direct and accurate way of assessing how health states impact on the lives of those most affected by different health conditions. The move would mean that we are not constrained to using simple descriptive systems like the EQ-5D.

It makes sense to focus on the (sometimes different) dimensions of health that have the greatest effect on the lives of all those affected by different conditions. Assessing the flow of subjective wellbeing over time would allow us to determine the duration weighted effect of different health states.

We recognise that there are sometimes problems with using direct patient values—for example, reference standards may change so that valuations before and after illness may not lie on the same scale.<sup>12</sup> There are also normative concerns about using values that reflect adaptation to a condition, especially when those who adapt could lose out in the competition for scarce resources because they have come to terms with their

loss in health and therefore are not seen to be suffering quite so much.<sup>13</sup> In some limited circumstances, it might be considered more appropriate to judge the value of some health states according to how they affect what people can do<sup>14</sup> rather than how they feel. We need a lot more discussion of this issue.

Most of us recognise that NICE has to take account of quality of life and length of

### Subjective wellbeing offers a more direct and accurate way of assessing how health states impact on the lives of those most affected by different health conditions

life gains when judging the relative cost effectiveness of different interventions. Subjective wellbeing provides us with a means of valuing the

real reduction in suffering that health technologies bring.

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**Competing interests:** None declared.

**Provenance and peer review:** Commissioned; externally peer reviewed.

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Cite this as: *BMJ* 2009;339:b2577

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## ANSWERS TO ENDGAMES, p 409. For long answers use advanced search at [bmj.com](http://bmj.com) and enter question details

### CASE REPORT

#### A complication after a previous caesarean section

- Women who have had a caesarean section should be reviewed by a consultant obstetrician early in the antenatal period and have a thorough discussion about the problems related to mode of delivery.
- Uterine rupture is the most likely diagnosis; it can cause death of the baby from asphyxiation and of the mother from haemorrhage and blood loss.
- The patient should be prepared for immediate delivery by caesarean section and the consultant obstetrician, anaesthetist, and paediatrician should be summoned.

### PICTURE QUIZ

#### An unusual cause of chest pain

- Pneumomediastinum is the presence of gas in the mediastinal tissues outside the oesophagus and tracheobronchial tree.
- This study is a water soluble contrast swallow. It is used in suspected oesophageal rupture to demonstrate a leak from the oesophagus into the mediastinum (figure).
- Boerhaave’s syndrome.
- If the patient presents within 24 hours, direct surgical repair or insertion of an endoscopic stent is usually advocated; after this time, a conservative approach may be the better option.

**Water soluble contrast study showing an oesophageal leak from the right side of the oesophagus (O) into the mediastinum (M) with only a small amount of contrast entering the stomach (S)**

