MEASURING PATIENT OUTCOMES FOR USE IN ECONOMIC EVALUATIONS - II

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UTILITY

Utility is a measure of the relative preference for various options.

Utility is the value attached by an individual to a specific level of health or a specific health outcome.

Different individuals may attach different values to the **same health state**. For example, some people may be prepared to tolerate a lot of nausea to allow them to be pain free.

UTILITY

Others may prefer to tolerate more pain and reduce the level of nausea.

The important concept here is that utility measurement allows patients to value their health status based on their ***own preferences***.

Like generic QoL measures, utility can be used

- *at groups of patients who may have different illnesses*
- *to compare outcomes in different patient groups*

UTILITY

Utility_measures go beyond generic quality of life measures because they enable quantitative comparison.

Simply, utility is used to attach a numerical value to the value a person has for a particular health state.

Imagine that on a utility scale,

Treatment A improves a group of patients' health by an average of 6 points.

Treatment B improves a group of patients' health by an average of 3 points.

UTILITY

Treatment A can be said to be **twice** as effective as **Treatment B**.

However,

Treatment A might be surgery for a ruptured Achilles tendon.

Treatment B might be rhDNase for cystic fibrosis.

This example shows that utility can be used to compare outcomes for very different treatments in very different patient groups.

The **specific methods** used to derive **utility** are **complex** and are still under development.

UTILITY

They are preference-based, which means that they allow individuals to indicate the direction and strength of their preference for a particular health state.

Attaching values to health states can be carried out using

- *Standard gamble*
- *Time trade-off methods*
- *A rating scale* (rarely used)

UTILITY

A. Rating scale

To understand these methods it is necessary to be familiar with visual analogue scales (VAS).

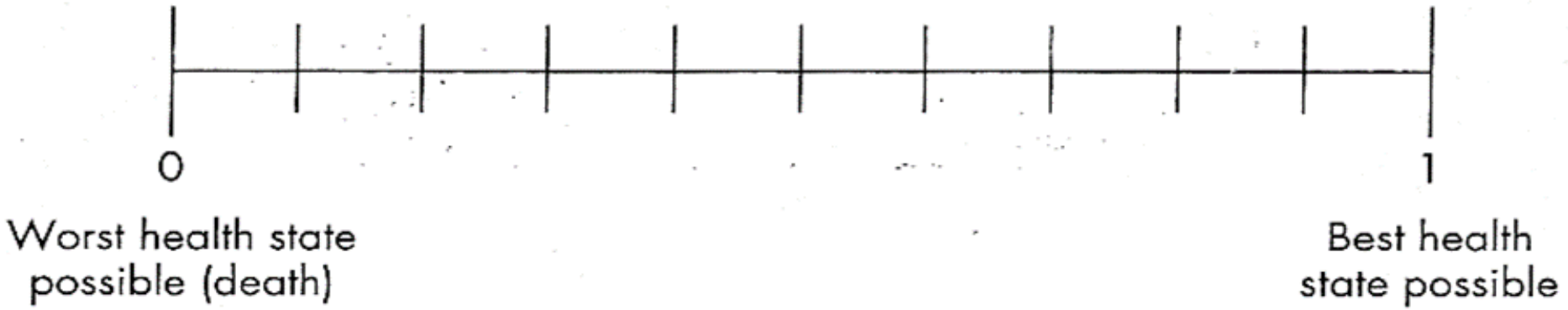


Figure 4.1 Visual analogue scale (VAS).

UTILITY

To help you understand this, try the following:

1. Mark on the scale where you think indicates how you feel now.
2. Mark on the VAS where you would value your health state if you had pneumonia.

The difference between (1) and (2) is the difference in your health state, as valued by you.

So, if you had pneumonia, and you were given some antibiotics to cure it, that difference in health state would be the health gain obtained by the drugs.

UTILITY

B. **Standard gamble** is considered by some health economists to be the gold standard for utility valuation.

In this approach, an individual is asked to choose between the following:

The certainty of surviving for a fixed period in a defined health state

Choice A: livings in health state *i* (a chronic health state between perfect health and death) with certainty.

Choice B: A gamble between a probability (*p*) of surviving for the same period without disability or a probability (1 — *p*) of immediate death.

UTILITY

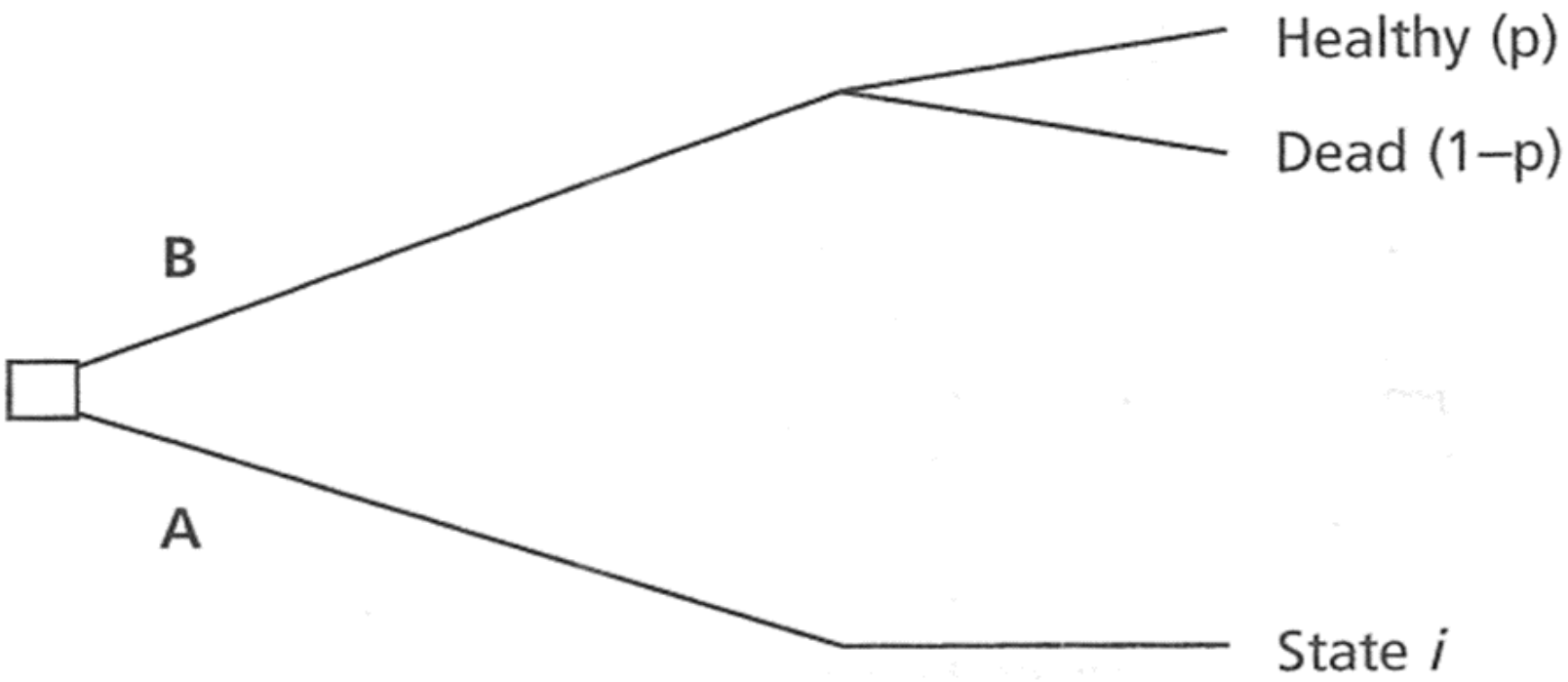


Figure 2. Standard gamble for a chronic health state. *i* = chronic health state; p = probability of achieving perfect health.

UTILITY

The probability (p) is varied until the person shows no preference (is indifferent) between the certain option and the gamble.

As an example, a person considers two options:

- **Option A:** a kidney transplant with 20% probability of dying during the operation (80% chance of returning to normal health).

- **Option B:** dialysis for the rest of his or her life.

UTILITY

If the person says he or she would have the operation if the chance of the successful operation p is 80% (chance of immediate death 20%), the percent chance of success is decreased until the person reaches his or her **point of indifference** (the point where the two options are nearly equal and the person cannot decide between the two).

If the person says he or she would not have the operation if the percent chance for success was 80% (chance of dying, 20%), the percent chance of success is increased until the person reaches his or her point of indifference.

UTILITY

Let us say that the first person chooses a 70% chance (p) of a successful operation (with a 30% chance [1-p] of immediate death) as the point of indifference between having a kidney transplant and living with kidney dialysis for life.

The **utility score** for this person for this disease state or condition (kidney dialysis) would be calculated as the probability (p) of living a normal life after the operation, or **0.7**.

UTILITY

The **limitations** of the **Standard Gamble** are that it are

- *time-consuming*
- *people have difficulty understanding probabilities*
- *the way how people value their health states can be influenced by how the questions are phrased or presented.*

UTILITY

A variety of other problems with the gamble have become apparent. For example, treatment of most chronic diseases does not approximate the gamble.

There is no known product that will

- cure a patient with arthritis **or**
- one that is likely to kill him or her

In other words, the decision-making experience of the patient is not likely to include an option that has a realistic gamble.

UTILITY

C. Time trade-off (TTO)

The third technique for measuring health preferences or utilities is the TTO method. Again, the subject is offered two alternatives.

Alternative 1 is a certain disease state for a specific length of time (***t***) the life expectancy for a person with the disease, and then death.

Alternative 2 is being healthy for time x, which is less than ***t***. Time x is varied until the respondent is indifferent between the two alternatives. The utility score for the health state is calculated as x divided by ***t***.

UTILITY

For example, a person with a life expectancy of 50 years is given two options:

Alternative 1 is being blind for 50 years

Alternative 2 is being healthy (including being able to see) for 25 years followed by death.

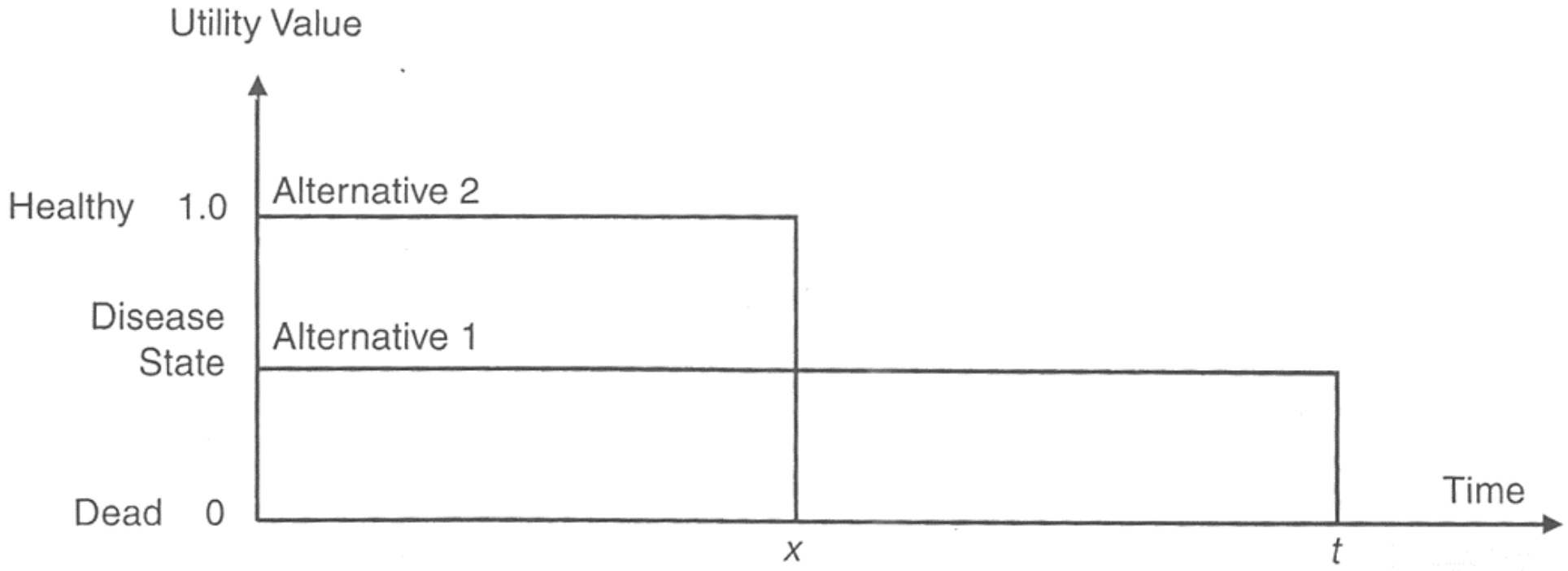
If the person says he or she would rather be blind for 50 years than sighted for 25 years, the number of years (x) of sight (healthy state) is increased until the person is indifferent between the two alternatives.

UTILITY

If the person would rather be sighted for 25 years than blind for 50 years, the number of years (x) of sight is decreased until the person is indifferent between the two alternatives.

Let us say that for a person who expects to live 50 more years, the person's point of indifference is 40 years of sight versus 50 years of being blind.

The utility score would be $x/t = 40/50$ or 0.8



Time tradeoff (TTO). This TTO schematic represents the choice a respondent makes about trading off years of life for better health for a shorter period of time. The respondent is given the choice of living a full life (to time t) with a specific condition or living fewer years (to time x) without this condition (being healthy). The time of living healthy is varied until the respondent is indifferent between living in full health x years and living with the condition for ***t*** years. The utility calculated for the condition is ***x/t***

PREFERENCE-BASED MULTI-ATTRIBUTE HEALTH STATUS MEASUREMENT

Three main methods are used:

1. ***Euroqol (EQ-5D)***
2. ***Quality of Well-Being (QWB)***
3. ***Health Utilities Index (HUI)***

PREFERENCE-BASED MULTI-ATTRIBUTE HEALTH STATUS MEASUREMENT

Euroqol (EQ-5D)

The EQ-5D (Dolan, 1997; Euroqol Group, 1991) is a standardized instrument for use as a measure of health outcome (see http://www. euroqol.org). Applicable to a wide range of health conditions and treatments.

PREFERENCE-BASED MULTI-ATTRIBUTE HEALTH STATUS MEASUREMENT

EQ-5D has five dimensions:

- ***Mobility***
- ***Self-care***
- ***Usual activities***
- ***Pain/Discomfort***
- ***Anxiety/Depression***

- There are three levels per dimension and respondents/patients describe themselves within this system.

EQ-5D QUALITY OF LIFE INSTRUMENT

1. Mobility
   - ☐ I have no problems walking.
   - ☐ I have some problems walking.
   - ☐ I am confined to bed.

2. 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.

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

4. Pain or discomfort
   - ☐ I have no pain or discomfort.
   - ☐ I have moderate pain or discomfort.
   - ☐ I have extreme pain or discomfort.

5. Anxiety or depression
   - ☐ I am not anxious or depressed.
   - ☐ I am moderately anxious or depressed.
   - ☐ I am extremely anxious or depressed.

PREFERENCE-BASED MULTI-ATTRIBUTE HEALTH STATUS MEASUREMENT

This means there are 243 possible health states plus unconscious. This is what some of these health states look like:

The EQ-5D health state may be converted to a score


THAT'S
ENOUGH!