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How do we assess the value for money of health care?

Summary: This Fact Sheet from the Health Services Research Association of Australia and New Zealand explains how economic evaluation and the incremental cost per Quality Adjusted Life Year (QALY) gained inform decisions about the value, and the funding of new health technologies and services.

Decisions to fund new health technologies and services are made on an ongoing basis. In Australia, many of those decisions are informed by recommendations made by the Pharmaceuticals Benefits Advisory Committee (PBAC), and the Medical Services Advisory Committee (MSAC). The remit of both committees is to provide access to effective and safe health technologies, at a cost that provides value for money to the Australian taxpayer.

To assess value, the costs and health benefits of a new health technology are compared to the costs and health benefits of the treatment that will be replaced if the new technology is funded. Health benefits are represented by the number of Quality Adjusted Life Years (QALYs) experienced by patients from the time at which they commence treatment.

One QALY is equivalent to one year of life that is lived without any form of ill health (in 'perfect health'). A person accumulates one QALY for every year in which they experience no ill health. A person gains less than one QALY for

every year in which ill health is experienced.

To estimate QALYs, we assign a value of 1 to people who are experiencing no ill health. A value of 0 is equivalent to being dead because no QALYs are accumulated after a person dies. Using data collected from large scale surveys of the Australian population, people experiencing some form of ill health are assigned a value between 0 and 1. The value reflects the effects of alternative forms of ill health on people's quality of life. For example, a value of 0.5 is interpreted as a quality of life that is half as good as having no ill health (or living in perfect health).

By estimating a person's quality of life over time, we can calculate the time spent with different levels of quality of life. Figure 1 provides an example. The 'With intervention' (e.g. new technology Y) line describes an expected quality of life profile for patients receiving an intervention, showing how quality of life declines over time. The 'Without intervention' line shows that quality of life declines at a faster rate in patients not receiving the intervention (e.g. old technology X). The times at which quality of life is assigned a value of 0 are the times at which patients are expected to die.

Figure 1 Combining estimates of quantity and quality of life to estimate QALYs

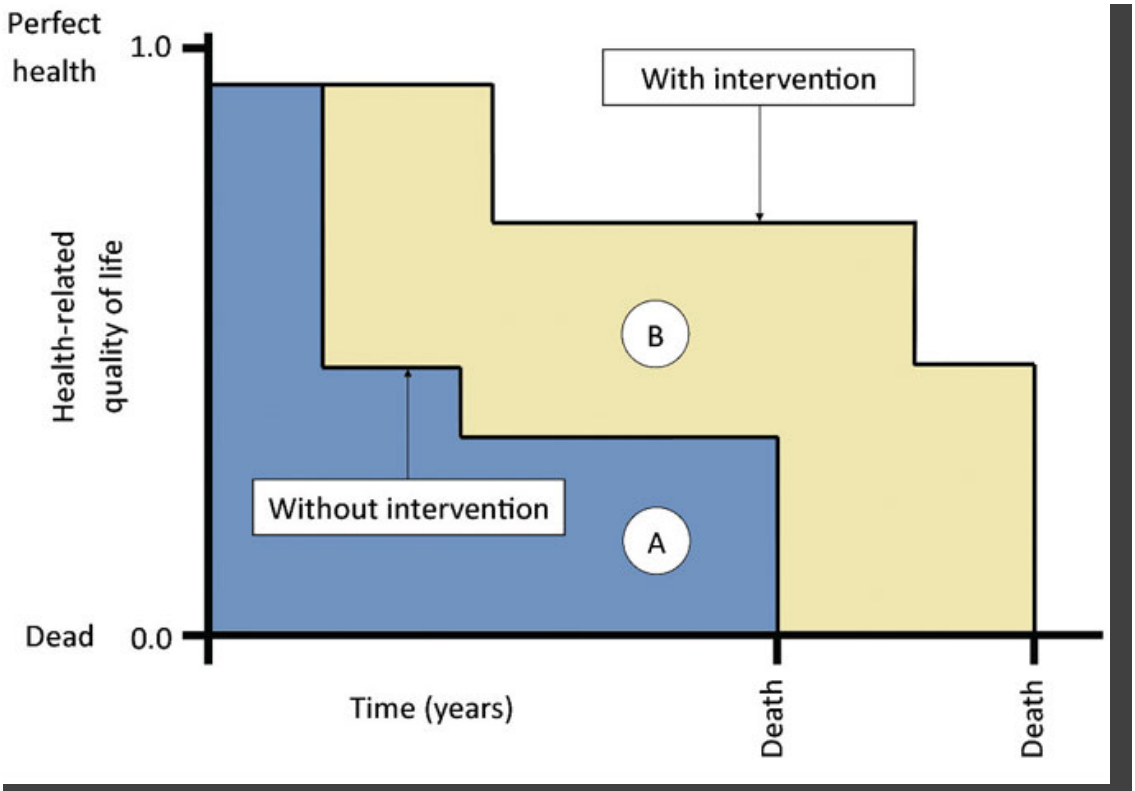

Figure 1 Combining estimates of quantity and quality of life to estimate QALYs

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From Figure 1, we estimate that patients receiving the intervention live for five years with a quality of life of 0.95, followed by eight years with a quality of life of 0.7, and then quality of life declines to 0.5 for the final two years of life. These patients experience 10.7 QALYs.

QALYs = [5 x 0.9] + [8 x 0.7] + [2 x 0.5] = 4.5 + 5.2 + 1 = 10.7

The corresponding expected QALYs for patients not receiving the intervention are 5.7 QALYs:

QALYs = [2 x 0.9] + [3 x 0.5] + [6 x 0.4] = 1.8 + 1.5 + 2.4 = 5.7

This example illustrates how QALYs reflect improvements in quality of life, as well as quantity of life (life expectancy). Almost all health care is intended to improve quantity or quality of life, and so the QALY can be used to represent the benefits of most health care interventions.

The benefits of a new technology are defined as the additional number of QALYs experienced by patients receiving the new technology compared to the existing treatment option. We also estimate the difference in expected health service costs incurred by persons receiving the new and current treatment options.

In the example, if new technology Y could be used to treat 1,000 patients every year who currently receive technology X. Patients receiving technology Y are expected to gain an additional 5 QALYs compared to patients receiving current technology X (10.7 – 5.7), which is a total of 5,000 QALYs across the 1,000 patients (1,000 x 5). Technology Y is also estimated to cost $100 million more than technology X to treat the 1,000 patients.

Opportunity cost

How should we use this information to determine whether new technology Y provides value for money to the Australian taxpayer?

We should compare the gain of 5,000 QALYs to the opportunity cost of spending $100 million on new technology Y. In other words, if technology Y is not funded, could the $100 million generate other benefits that are valued more highly than 5,000 QALYs?

Of course, if technology Y is not funded, the $100 million might not be spent on health care, but on education, transport or defence. It is difficult to compare the benefits of spending across government sectors, but it may be easier to assess whether the health of the population could be increased by a greater amount if we allocated the $100 million to other forms of health care. In public hospitals, such funds could be used to reduce waiting times, or to improve the quality of the health care provided. Outside of the hospital, there are many health promotion and health care programs that have been shown to be effective, that have not been funded.

Such comparisons are difficult because funding decisions in public hospitals, or for community health programs are not informed by the same open assessment of value for money used to inform listings on the PBS.

Greater transparency and consistency in the processes for making funding decisions across the health care system would better inform the value of the taxpayers' money that is spent on health care. We could compare the additional costs and QALYs of new drugs, public hospital services, and out-of-hospital programs to determine which funding options provide the best value.

In the absence of transparent and consistent processes for assessing value for money, how is the value for money of new pharmaceuticals assessed?

To provide a consistent basis for judging value for money, the expected additional costs of technology Y ($100 million) are divided by the expected gain in QALYs (5,000), to estimate the expected incremental cost required to produce one additional QALY ($20,000). This is essentially an estimate of the cost of buying additional QALYs. A judgment is then made about whether spending $20,000 to gain one additional QALY represents good value for money.

Public summary documents are published for each pharmaceutical assessed by the PBAC. Recent documents suggest that new pharmaceuticals are generally recommended if their expected incremental cost per QALY is lower than $40,000 [1]. In many cases, the price of a new drug is lowered until the incremental cost per QALY is acceptable. The source of this 'threshold' value is not known as there has never been any open discussion around the basis for defining the value for money of new pharmaceuticals in Australia.
One way to inform the value of gaining additional QALYs is to analyse health systems data to estimate the average incremental cost at which QALYs have been gained in the past. If a new assessed is gaining QALYs at a lower

incremental cost, we can be more confident that the health system is becoming more efficient over time.

In England, recent research estimated that the average incremental cost at which QALYs are gained is around £13,000, which is two thirds of the £20,000 threshold value that is currently used in England. We are conducting a similar research project in Australia funded by the National Health and Medical Research Council.

The estimation of the average incremental cost at which additional QALYs are gained in Australia will provide a stronger basis for assessing the value of new technologies. It will also inform health care funding decisions more generally, for example, when looking at the value of expanding, contracting, or ceasing the delivery of an existing service. The specification of an explicit basis for assessing value for money would also improve the transparency of decision-making. As noted by the Department of Health, this would allow Australian taxpayers to participate in discussions around the value of new health technologies [2].

References

[1] http://www.pbs.gov.au/industry/listing/elements/pbac-meetings/psd/2014-07/infliximab-psd-07-2014.pdf

[2] http://www.health.gov.au/internet/main/publishing.nsf/Content/govt-response-cancer-drugs

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