

Introduction to Economic Evaluation in Health

Sydney 31 March 2017

By: Ian Roberts-Thomson, Physician

All countries accept the need to invest in health. Good public health services prolong life and improve the quality of life and, along the way, contribute to economic growth. However, the cost of health services has been increasing exponentially for at least two decades, partly because of the expansion of health services and partly because of the increasing cost of equipment, consumables and drugs.

Currently, Australia spends approximately 10% of GDP on health [slightly more than many other high-income countries] but significantly less than health expenditure in the USA [17% of GDP]. It is widely acknowledged that higher health expenditure in the USA has not resulted in better health outcomes.

One way of addressing the issue of competing priorities is cost-effective analyses. At the heart of these methods is the notion that health resources should be allocated across interventions and population groups to generate the highest overall level of population health.

So, what were the messages from the "Introduction to Economic Evaluation in Health" course in Sydney? For me, the major messages were as follows:

[1] When the majority of health services are funded by government, the "market" does not work [perhaps apart from private hospital insurance].

[2] Costs are difficult to contain; some savings are made at the Federal Government level [eg. drug costs] and some savings are made by state governments or hospital authorities.

[3] Cost-effective analyses are complex. One issue is the evaluation of costs. This includes an assessment of disease burden, intervention costs [eg. drugs, vaccines], personnel costs and infrastructure costs. Equally difficult are the benefits that include better health, a longer life and the avoidance of future costs.

[4] There are several outcomes of cost-effective analyses. The simplest is cost per year of life gained. This is easiest for infections in childhood. However, for many disorders, the years of life gained may not be great but the disability avoided can be significant. This led to the development of the quality-adjusted life year [QALY] and, by extension, to the cost per QALY gained. This method has been widely used in Australia and Europe to assess the cost-effectiveness of new drugs in relation to existing [but often cheaper] alternatives and can be used to generate an incremental cost-effective ratio [ICER]. A recent focus has been on expensive drugs for the treatment of hepatitis C: there is now the potential for cure with the avoidance of problems with cirrhosis and liver cancer in 20-50 years. Yet another outcome is the disability-adjusted life year [DALY] with a cost per DALY averted. The DALY was developed as an integral part of the Global Burden of Disease Study in the 1990's.

[5] Results of cost-effective analyses are only one of several factors that may lead to the approval or otherwise of new drugs on the PBS.

My overall impression was that cost-effective analyses are important but difficult to do well. In particular, seemingly minor changes in costs or benefits can make striking changes in the cost per QALY or cost per DALY. In the UK [and probably in Australia], a drug is seen to be cost-effective if the cost per QALY is less than A\$40,000-\$50,000 although higher cost can be tolerated for interventions that are only needed by a small number of patients.

The course was a useful introduction to a difficult topic but I am uncertain of the frequency of referral of studies of this type to Ethics Committees.

Introduction to Economic Evaluation in Health Sydney 31 March 2017 By: John Hackett, Community Representative

Presentations from a team of Health Economists led by Associate Professor Rachel Morton; NHMRC Clinical Trials Centre, University of Sydney

This one day course set out to introduce the basic concepts and tools for economic evaluation in health, summarised in the Health Technology Assessment (HTA). 'A systematic examination of a new health technology (i.e. a drug, medical device, surgical procedure) for:

- Safety, clinical efficacy, and effectiveness
- Costs, cost-effectiveness
- Organisational implications, social consequences
- Legal and ethical considerations of—usually a drug, medical device or surgical technique.'

The course used three case studies to illustrate analyses using economic tools;

- Example 1. "Healthy Beginnings": Early childhood nurses working closely with young families in one of the most socially and economically disadvantaged areas of Sydney, with goals to improve poor childhood obesity.
- Example 2. "WEBB" (Weight-bearing Exercise for Better Balance): A program of home based and weekly physiotherapist led exercises for elderly people discharged from hospital, with goals of prevention of falls and improving physical mobility.
- Example 3. "Sofosbuvir": Public funding of an oral, direct acting anti-viral, shorter term duration, interferon-free treatment for potential use in all strains of Hepatitis.

Course participants took part in an exercise using 'Visual Analogue Scales' (VAS), 'Standard Gamble' (SG) and 'Time Trade Off' methods (TTO) to understand Quality Adjusted Life Years (QALYs) and their potential use in economic evaluation in health.

An Incremental Cost Effectiveness Ratio (ICER) is determined by dividing the cost of the intervention by the QALYs gained. Australia has an arbitrary ICER benchmark of \$50-60,000 per QALY gained, which has not changed for 10 years.

A group exercise was used to establish costs for the "WEBB" intervention and participants used QALYs to calculate an ICER of \$81,833, which appeared to be well above the Australian ICER threshold.

The "Healthy Beginnings" intervention had an ICER of \$47,000 and was recommended for funding by the Pharmaceutical Benefits Advisory Committee (PBAC).

"Sofosbuvir" was rejected twice by the PBAC after ICERs of \$15,000 - \$45,000 were seen as being underestimated and unreliable. However it was eventually funded in December 2015. Federal Health Minister, Sussan Ley described the >\$1 billion investment in Hep C treatment in her press release as "a watershed moment in Australian history," The impression that political considerations were more important than health benefits was reinforced by a graph detailing how many health projects over a ten year period were funded outside the ICER guidelines.

As an HREC member this course helped me to gain insights into the health related decision-making from the economic considerations perspective. While understandably important for governments and other health and medical funding agencies; individual patients, their advocacy groups or medical clinicians may not share this view. Unfortunately, as this was a one-day introductory course there was no mention of ethical considerations, nor was there any opportunity for course participants to share their points of view.

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By: David Ng, Clinical Pharmacist

The Introduction to Economic Evaluation in Health is a short course delivered by a consortium incorporating the NHMRC Clinical Trials Centre, the George Institute for Global Health, the University of New South Wales, the National Drug and Alcohol Research Centre and the University of Sydney. Through a combination of didactic presentations and case studies, and as the title suggests, the course provided a brief introduction to economic concepts, the use of economic tools, the conduct of economic analyses and the use of economic evaluation in health policy setting and the allocation of scarce resources.

A definition of economics was proposed and as defined by Paul Samuelson *‘as the study of how men and society end up choosing, with or without the use of money, to employ scarce productive resources that could have alternative uses, to produce various commodities and distribute them for consumption, now and in the future, among various groups in society’*. Whilst markets are usually an efficient method for allocating resources, market failure can occur when there is an imbalance of consumers and producers, in the presence of monopolies or oligopolies, where there is imperfect information available to the market, and when there are issues of inequality. In such a situation, governments and policymakers may be required to intervene and/or assist in the allocation of resources for the benefit of society through administrative policy and/or financial resources and incentives.

In the case of health, some of the economic tools that are available to assist in decision making and the allocation of resources include health technology assessments, cost of illness studies, costing studies, return on investment, cost benefit analyses, cost effectiveness analysis, and cost utility analysis. Each of these tools are contextual and require an understanding of the context and interventions, they describe outcomes from the perspective of the study i.e. government, societal or payer; and are limited by the assumptions and an accurate and/or encompassing inclusion of all the outcomes and inputs that are under consideration. The course provided a brief description and explanation on the use of each of these economic tools, their pros and cons and a number of examples that enabled participants to understand what data is required to perform the required analyses and how the tools are used in practice.

The final session of the day, reviewed how the economic evaluations can be used in a policy context and how priorities are determined through a needs based approach through the burden of disease or cost of illness models and other marginal/economic approaches. The evaluation process for the listing of pharmaceuticals onto the Pharmaceutical Benefits Scheme by the Pharmaceutical Benefits Advisory Committee was provided as an example of how economic evaluations are used in practice.

In conclusion, this short course provided a good introductory overview (or refresher) of economic evaluation in the context of health. The use of examples and practical exercises was a good method in engaging with participants and provided an opportunity to get a better handle on each of the economic tools that is used in practice, and can help better understand some of the rationale for outcomes that should be expected from clinical trials. The support of Bellberry to attend this short course is gratefully acknowledged and appreciated.