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ECONOMIC EVALUATION AND HEALTH CARE RESOURCE ALLOCATION: UNDERSTANDING RESEARCH UTILISATION

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Abstract

Over recent years health economists have become increasingly concerned with the level of impact that economic evaluations have on the decisions they are designed to inform. This paper reviews the literature in this area using Weiss's frameworks for understanding research utilisation. The barriers to use of such evaluations are divided into issues of *accessibility* and the more difficult to overcome issues of *acceptability*. The authors argue that normative health economics has tended to adopt a rationalist 'problem-solving' model of health policy decision making. The importance of considering other models of research utilisation, particularly the 'interactive' model, is discussed.

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Introduction

This paper is concerned with the use (or lack of use) of research evidence relating to economic analyses in health care decision-making. The central problem addressed by the discipline of economics is that of resource scarcity, and so the purpose of economic analysis is, in a very broad sense, to help decision makers when addressing problems arising due to the scarcity issue. Therefore, such evidence is generated with the direct intention of influencing policy - but is that objective achieved? Over recent years there have been repeated expressions of concern about the usefulness of health economic analyses, and responses have tended to centre on questions of how research by health economists can be made more useful and accessible to policy makers (for example, Bryan & Brown, 1998; Ross, 1995; Duthie et al, 1999).

It is now timely to reflect on the research evidence concerning the use of economic analyses and to map out an agenda that needs to be addressed if we are to maximise the impact of economic analyses. This paper includes a brief (if incomplete and non-systematic at this stage) review of the literature in this area, and a discussion of the framework within which issues of the use of economic evidence in policy making might be considered. The review forms part of a research project that also includes a survey and case study research of NHS policy decision makers and their use of economic analyses. This paper does not report results of this ongoing fieldwork.

Findings from empirical studies

A review has been undertaken of empirical studies that investigated issues relating to the use of economic analyses in health policy decision-making, in the area of health care. Preliminary findings are reported here (as the review is ongoing). The literature was identified through searching key bibliographic databases (i.e. Medline, Embase, HTA dbase, National Research Register, ISTAHC, OHE HEED, WHO). The studies that have been identified thus far are reported in Tables 1 and 2.

The review has identified empirical work undertaken in the UK, other European countries, North America, Australia and Canada. Typically, these studies included some attempt to gauge the influence of economic evaluation on decisions to invest or disinvest in health technologies. There was substantial variation in methodological approaches and in the tiers of policy making addressed. Research methods adopted included: postal surveys, structured interviews, semi-structured interviews and participant observation. The decision makers studied were drawn from national policy levels (e.g. Ross, 1995) and/or regional and local bodies (e.g. Walley, 1997). Whereas some studies had a narrow research focus specifically on the impact of economic evaluation on policy formation others included an investigation of the economic analyses as part of a broader focus on the influence of Health Technology Assessment (e.g. Lyles et al, 1997; McDaid & Cookson, 2003).

Despite these differences in research strategy and scope, each study reports results indicating levels of use of economic evaluation information as *moderate* or *low*. One of the factors that was indicated as contributing to this result was limited awareness and understanding of economic evaluation studies and methodologies by those making policy decisions. This was despite some evidence suggesting that decision makers appreciated the *potential* value of cost-effectiveness measures to the policy process (Drummond, 1997).

Positive versus normative economics

In considering issues relating to the use and impact of economic analyses it is helpful to return to the division of activity undertaken by economists: 'normative' economics and 'positive' economics. In the former, value-judgements about what in general ought to be done in society are made and inferences are drawn in order that specific courses of action are recommended. In a normative sense the aim of the economist is to indicate the nature of the resource allocation decision that ought to be followed if certain objectives are to be achieved. In contrast, positive economics is value-free (not be confused with worth-less!) in the assumptions of the analysis and is intended to be entirely predictive of observable factors. It provides information that can help address resource allocation problems, but cannot be used to reach recommendations concerning any particular policy. It can only point out the observable consequences of policy.

The community of health economists is engaged in both positive and normative economics, although the aspirations of many are for normative analyses to be … the norm. The desired objective of health economic analyses is frequently to indicate the nature of the resource allocation decision that *ought* to be followed. An important prerequisite for such a normative stance is that the analyst has a good understanding of the objective function (i.e. what should the health service be seeking to achieve?) and the decision rules to be applied. As Culyer points out, the process of agreeing objectives is not necessarily straightforward:

> *In the real world ... policy makers and most other people who seek economic advice do not have well-articulated ideas of their objectives. One of the first tasks of a cost-benefit analyst, for example, is usually to seek to clarify the objectives – even to suggest some.*
>
> Culyer (1973, p254)

Many health economists in the UK have taken Culyer at his word. The proposal put forward is that the objective of health care services should be to maximise population health benefits (Williams, 1985). For many this appears not to be a highly controversial suggestion and, in broad terms, receives

support from policy makers and the public more generally (Bryan et al, 2002). The difficulties and disputes arise primarily around attempts to measure health. Over the course of the last 20 years or so the sub-discipline of health economics has had a methodological focus on the measurement and valuation of health. The result is a measure of health that can be operationalised for use in policy making, i.e. the quality-adjusted life year (QALY) or quality-adjusted life expectancy (QALE). (Clearly this describes an extra-welfarist position, and is given prominence here given its dominance in the UK. However, it is important to be aware of those from a welfarist tradition but given their minority status, we will ignore them from now on in this paper!) The decision rule, therefore, for normative health economic analyses is to advocate investment in those technologies that produce the largest QALY gains for a given level of cost. In order to inform such decisions, normative analyses tend to provide results in the form of the incremental cost-effectiveness ratios (ICERs), net-benefit statistics and cost-effectiveness acceptability curves (CEACs).

- The ICER reports the ratio of additional costs to additional health effects associated with a new intervention (e.g. cost per quality-adjusted life year gained).
- The net-benefit statistic expresses the additional health effects in monetary units by using an estimate of the 'maximum willingness to pay' per unit of health gain, where available.
- The CEAC plots the probability that the intervention in question is cost-effective against threshold values to define cost-effectiveness.

In contrast, a positive analysis generates information on the likely costs and benefits associated with alternative courses of action. Dowie (1996) describes such research as knowledge-generating, as opposed to decision-making technologies. For example, the economic analysis reported by Davenport et al (2002) predicts the magnitude of cost savings and the loss in dental health that might result from a policy of less frequent (i.e. 12-monthly) routine dental checks. A distinguishing feature of such positive analyses is that agreement concerning objectives, between the researcher and decision maker, is not required. In addition, there is no a priori requirement for a single objective to be specified. Positive health economic analyses might involve the use of a *profile, or cost consequence approach* to reporting results. This is where the predicted impacts of the intervention in question are detailed, possibly in a tabular form, without any attempt to summarise or aggregate across different dimensions (Mauskopf et al, 1998; Freemantle & Mason, 1999). This process could be applied to both resource use / costs items (including specific health care service use and costs, and productivity losses) and health outcomes (including disease symptoms, life expectancy and quality of life). Kernick is a strong advocate of such a positive approach:

> *Cost consequence analysis emphasises the importance of presenting data on costs and benefits in disaggregated form, implying a recognition of the value judgement from*

decision makers and an acceptance that benefits and disadvantages cannot always be condensed into a single output measure.

Kernick (2000)

Research utilisation

Whilst the methodology adopted by the researcher might, in some circumstances, be expected to influence a policy response, in general researchers seeking directly to influence policy require an appreciation of how policy institutions and processes operate, often largely autonomous of research communities. Having looked at factors underpinning the design of economic evaluations we now turn to broader debates surrounding the influence of policy-related research in general. Research communities across the social sciences have long aspired to increase the impact of their findings on policy and practice, as illustrated in recent years in debates surrounding evidence-based health care (Black, 2001). The aspiration towards evidence-based policy decision-making evokes a conception of research utilisation defined by Weiss as the 'problem solving model' (Weiss, 1979). In this model empirical and analytical evidence and conclusions are applied directly to a policy problem and, whether 'off the shelf' or commissioned especially, supply the information required to enable the optimal solution to be implemented.

For the problem solving model to apply, the recommendations of a normative economic analysis, for example, would need to be implemented directly by the relevant policy maker and would be seen as the driving force behind the decision reached. Whether applied prescriptively or descriptively, this model - elsewhere referred to 'instrumental' research use (Larsen, 1980) – considers the generation of empirically-based decision recommendations as the main requirement of effective research utilisation. It is assumed that the decision makers in question are able and willing to act on research findings. It also assumes that the objectives to be achieved by the decision are shared by all relevant participants in the policy process. Therefore, as Weiss indicates:

... when this imagery of research utilisation prevails, the usual prescription for improving the use of research is to improve the means of communication to policy makers.

Weiss (1979 p.428)

Dowie (1996) sees this problem of communication as arising from the fact that researchers and policy makers (or 'practitioners') occupy very different positions on both the 'cognitive mode' and 'task structure' dimensions.

> *... research results are developed in the more highly analytic and well structured modes, whereas action occurs in the distinctively less analytic and ill-structured modes characterised by practice.*
>
> Dowie (1996 p.9)

This position is also seen in the work of Drummond and Weatherly (2000) who talk in terms of researchers occupying a 'scientific paradigm' and decision makers a 'policy paradigm'.

Effective communication is paramount if consensus on decision criteria and objectives has been established. However, Weiss (1979) calls into question the likelihood of establishing single, agreed objectives in decision scenarios, pointing to a number of interconnecting conditions required for the smooth execution of problem-solving research use. These are listed below:

- *A well defined decision situation*
- *A set of policy actors who have responsibility and jurisdiction for making the decision*
- *An issue whose resolution depends on information*
- *Identification of the requisite information need*
- *Research that provides information in terms matching circumstances of choice to be made*
- *Research findings that are clear-cut, unambiguous, firmly supported, timely, understandable and not counter to strong political interests*

Weiss (1979)

Whilst many economists may adopt a normative view that the problem-solving model has much to recommend it, it has to be recognised that the real world rarely lives up that aspiration. For example, in a review of UK studies into factors effecting evidence-based policy-making, Popay and Elliott (2000) conclude that many policy problems are often intractable or not clearly enough delineated to be tackled directly and comprehensively. They also found that research evidence is frequently unlikely to be sufficiently clear-cut and unambiguous to translate directly into policy. They also call into question the assumption of a straightforward policy process in the problem-solving model and conclude that dissemination of health services research results has been hampered by a preoccupation with the rational, problem-solving model.

The gap between these direct conceptions of research implementation and the more complex reality of the policy environment are identified in some of the studies listed in Table 1. In interviews with national level health policy decision makers in Australia, Ross (1995) found that far from reflecting a problem-solving, research-led model, decision-making was subject to multiple influencing factors including: political considerations, administrative arrangements, equity concerns, societal opinion and

the values and attitudes of decision makers. In a UK context, Coast presents findings of qualitative interviews with professionals from health care and related sectors. These indicate that at a meso policy level the process of decision-making can be characterised as:

> *a system of equivocation involving a complex set of interactions in which there are a number of obstacles.*
>
> Coast (2001 p.168)

Here even the phrase 'decision maker' is called into question by evidence of practices designed to postpone decisions or to pass them on to others. Despite this work, it has been argued that interventions by health economists in the area of research utilisation have not always addressed the totality of factors which influence policy makers or fully account for the complexity of health care decision making processes (Kernick, 2000).

Given the likelihood that policy makers seek information not just from researchers but from a variety of sources, it appears that Weiss's 'interactive model' of research utilisation carries greater descriptive power (Weiss, 1979). The interactive model illustrates how decisions are based on negotiated compromise and the balancing of competing interests, rather than solely on the available evidence base. Decisions taken will reflect consultation, experience, political insight, pressure and judgement and the influence of research evidence is diluted by these other inputs and imperatives. The Social Influences Model (Estabrooks, 2001) is a corollary of this approach that emphasises the impact of habits, customs, norms and conventions, especially in situations where the uncertainty of outcomes for decision options is high. Interactive and Social Influences models acknowledge that decisions are subject to the influence of power relations in which multiple actors with competing preferences form alliances to exert influence over the decision-making process. The implications for research utilisation of the interactive model of research utilisation are far-reaching. The logical/empirical approach of the problem-solving model is replaced by the constraints of a policy environment characterised by 'disjointed incrementalism' (Estabrooks, 2001).

The distinction between problem-solving and interactive models of research utilisation correlates, to some extent, with the binary of normative and positive approaches to health economic analyses. The requirement for agreement of purpose and objectives between researcher and decision maker is a defining premise of both normative economic evaluation and rationalist conceptions of policy research utilisation. Positive approaches to evaluation, on the other hand, may be seen as more helpful to decision makers involved in policy processes that are marked by interaction and competing or multiple objectives. An understanding by the analyst of the nature of the policy environment into which the

analyses are being placed is required. This will allow more informed choice to be made concerning the appropriate approaches to analysis and presentation of results.

Reported barriers to use of economic evaluations: *accessibility* versus *acceptability*

We have begun to explore some of the reasons for the moderate impact on health policy of economic evaluation results. Empirical studies themselves have attempted to identify the main barriers and in this section of the paper we begin to develop a framework to understand these. We have divided reported barriers into two broad categories: those relating to the *accessibility* and those relating to the *acceptability* of economic evaluations.

Accessibility

The extent to which decision makers will consider the results of economic evaluations to be *accessible* is determined by availability, the time at which it becomes available – this needs to coincide with the timeframe for the decision to be taken – and its clarity and comprehensibility. Studies conducted in the mid-to-late 1990s in particular emphasise the difficulties decision makers face in obtaining economic evaluations (e.g. Luce & Brown, 1995). Reasons for this include the shortage of relevant economic analyses and problems with accessing those studies that were published. A second barrier is presented by the difficulty in commissioning evaluations that are delivered in a timely manner (Sloan et al, 1997; Lyles et al, 1997) – i.e. the issue of being able to find appropriate analysts and the issue of ensuring that commissioned work is delivered in a timely manner. Finally, the literature highlights difficulties with study comprehension and interpretation. Research indicates that decision makers struggle to digest health economic concepts, language and presentational styles (Drummond et al, 1997; Hoffman et al, 2000).

Acceptability

The second category of barriers pertains to the *acceptability* of the results of economic evaluations. The category 'acceptability' is used here to refer to all barriers that arise *after* economic evaluations have been accessed and understood. Studies are deemed less acceptable if decision makers are unable or unwilling to act upon their recommendations. Sub-categories of this group of barriers are:

- Scientific / technical acceptability
- Structural / institutional acceptability
- Ethical / political acceptability

Scientific or *technical* acceptability refers to concern over bias and the lack of independent sponsorship of economic evaluations (Luce & Brown, 1995; Sloan et al, 1997). In one study

respondents questioned the objectivity of the authors of evaluations. For example, one interviewee claimed that

> *... he had never seen a study that did not prove that the drug was cost effective*
>
> Sloan et al (1997, p.532)

Studies have also found *structural/institutional* barriers to implementation of economic evaluation results, especially at local decision-making levels. For example, budget holders operating within annual budgeting cycles may be under pressure to contain cost over and above promoting efficiency (Walley et al, 1997). Others experience difficulties redirecting resources across inflexible financial structures (Elsinga and Rutten, 1997; Hoffman, 2000). These barriers feature strongly in a study of regional decision makers in the UK (Duthie et al, 1999). Different approaches to conducting and reporting analyses were found to appeal to different audiences (e.g. GPs and managers). Interviewees claimed that savings identified in economic evaluations were frequently unrealisable in practice. Health economists were perceived as being ill informed on issues such as block contracting agreements and the effects of secondary care costs upon primary care budgets.

In summarising the results of a number of connected studies of European health care systems, Hoffman et al (2000) emphasise issues of institutional acceptability as being of greater significance than the accessibility of study recommendations. They conclude that:

> *... the most discouraging factors are not related to the intrinsic properties of the evaluation studies themselves ... but rather to institutional factors. It would appear that general institutional factors making up the organisation of the whole health care system (difficulties in transferring budgets, resources allocated on a budget rather than economic basis etc) are more responsible for restricting the use of economic methods than the immediate institutional context where the methods are used.*
>
> Hoffman (2000, p12)

In an exposition of local health policy decision making, McDonald (2002) confirms the institutional barriers to use of economic evaluation, and goes on to address the *ethical* and *political* acceptability of health economics as a technique for the implementation of programmes of prioritisation. She carried out participant observation in a UK health authority that had requested input from a health economist in their commissioning of services for Coronary Heart Disease. During her involvement with the authority, she found that attempts to apply a rational, problem-solving approach to resource allocation resulted in a 'paralysis' caused, in part, by complex funding constraints. It is reported that this highly

rational approach to the decision problem was considered by decision makers to be less satisfactory than standard 'non-rational' practices of 'muddling through' in a context of resource scarcity.

McDonald notes that the problem-solving model (subsumed in her categorisation under the header of 'rational' models) of research utilisation assumes that implementation of findings will follow where there is unity of purpose between researcher and policy maker. However, her research reinforces Weiss's assertion that such shared objectives are not routinely achieved. She calls into question, for example, the synergy between health economists' imperative of maximising health gain, and decision makers who could not be said to be following any such single maximisation principle. A key complicating factor here is the political and ethical unacceptability, within the NHS, of the explicit rationing advocated by health economics. As a result of these two sets of factors - the complex and perverse structures of the NHS and its fundamental value conflict with health economics – McDonald concludes that it is inappropriate to prescribe rational frameworks for NHS decision makers. In this context health economics only serves to highlight to decision makers the gap between the rationalist ideal and the structural and political reality of the system.

Conclusions

The literature in this area charts a growing realisation of the conditions and contingencies of the health decision making environment. There has been a move away from an assumption of policy involving simple, rational choices to a realisation of an interactive process with competing aims and considerations. Barriers can be seen as operating around principles of acceptability and accessibility. Accessibility is well understood and has been addressed to a limited extent, particularly at national levels where the ability to generate, access and interpret economic evaluations has increased. Acceptability issues such as system rigidities, value conflict, and competing objectives are more difficult to overcome as this would require broader changes to the macro-political and institutional environment of health care policy making.

Much of the health economics literature to date has concentrated on barriers of accessibility of economic evaluation results. This suggests a view that improvement in the process by which evaluations are *communicated* to decision makers, and the latter's capacity to follow their recommendations, ought to be the focus of attention and activity if impact is to be maximised. In other words, the emphasis is on tweaking the process at both ends in order to support rational implementation of research findings. A focus on barriers to the *acceptability* of economic evaluation directs us away from such an approach. Instead, we see that barriers to its use derive from substantive disjuncture between researchers and decision makers in terms of objective functions, institutional contexts and professional value systems.

McDonald's involvement in local commissioning generated a dissonance on decision makers part between how they ought ideally to be behaving and the constraints of the policy process. Peacock and Richardson (1998) in another context, indicate that this raised awareness itself can lead to a development in the rationality and evidence base of decision making. In a similar argument Culyer (1996) makes a case for the longer-term impact of health economics as a set of fundamental principles. These arguments recall Weiss's 'enlightenment' model of research utilisation or what Larsen describes as 'conceptual' research use. This refers to more diffuse influence such as policy agenda setting and shaping perceptions of the complexity and consequences of decisions taken (Innvaer et al, 2002). Health economists have hitherto focussed on direct or instrumental utilisation. However, this may overlook the longer-term influence of the health economics movement on health care resource allocation and underplay opportunities to maximise this influence in the future. Enlightenment use is much more difficult to measure than direct use but this does not mean its influence should be dismissed. Weiss's enlightenment model of research utilisation helps us to understand that health economics, despite limited direct use, may be part of a broader process of making decision-making more explicit and more rational. Both interactive and enlightenment models suggest a role for the health economist beyond the production of research findings.

In conclusion, if health economists are to achieve greater influence in health decision making in the UK then there is a need for us to acknowledge the realities of an interactive policy environment and continue to 'jockey for a position of influence within the policy process' (Popay and Elliot, 2000).

Possible issues for discussion:

- Positive versus normative health economics
- Knowledge-generating analyses versus decision-enabling framework
- Barriers to use: *accessibility* versus *acceptability*
- Problem-solving versus interactive models of research utilisation

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Table 1: Empirical studies (excluding European survey)

Author(s) / country	**Decision level / maker**	**Results**
Luce & Brown (1995) US	Decision makers from hospitals, HMOs and 3rd party payers	Impact of economic analyses limited
Ross (1995) Australia	Commonwealth and State levels	'The majority of respondents had not used economic evaluation'
Drummond et al (1997) UK	Prescribing advisers, hospital directors of pharmacy and directors of public health	9.1% considered 'economics issues' most important consideration; 48.5% considered important but secondary
Lyles et al (1997) US	Pharmacy decision makers in managed care organisations	'socio-economic assessments' have limited impact
Sloan et al (1997) US	Hospital pharmaceutical decision making	37% indicated frequent use of cost-effectiveness information
Walley et al (1997) UK	Primary care prescribing advisers	5% considered 'economics considerations' most important consideration
Duthie et al (1999) UK	General practice, hospital and health authority	Use and value of economic analyses recognised but limited practical relevance and application
McDonald (2002) UK	Regional health authority commissioners, primary care	Health economics has little impact
McDaid and Cookson (2003) EU	Not stated	Identified the need for 'developing receptor capacity within different stakeholder groups'

Table 2: European Survey 2000

Author(s) / country	**Decision level / maker**	**Results**
Sintonen (Finland)	Physicians, directors and managers of health organisations.	'use of the results of economic evaluations is quite limited.'
Antoñanzas et al (Spain)	Ministry of Health, hospital pharmacists	'little utilisation of these techniques'
Abbühl (Austria)	Government, hospital doctors and general practitioners	'a tremendous lack of awareness …on all levels of decision making'
Hoffman & Schulenburg (Germany)	Hospital doctors, general practitioners, politicians, reps of sickness fund and industry	'At present economic evaluation does not play an important role in health policy'
Nord (Norway)	Ministry of Health, other ministries, hospital directors, county health directors	'little use of other techniques than monetary cost benefit analysis'
Pinto (Portugal)	General practitioners, specialists, regional health authority, Ministry of Health	'75% of respondents stated that they never used results of studies in decision-making'
Benamouzig & Launois (France)	Unclear	Unclear
Van Rijkom & Rutten (Netherlands)	Members of parliament, health politicians, specialist physicians, hospital pharmacists	'The influence of economic evaluations on their decisions was moderate'
Crump et al (UK)	NHS Trust medical directors & directors, general practitioners	'no concrete examples of the use of economic studies in decision-making'

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