

Guest editorial

Appropriate perspectives for health care decisions

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Introduction

In many countries cost-effectiveness must also be considered before allowing access to new and more expensive drugs, a so called “fourth hurdle” (Taylor et al, 2004). However, there is little consensus over the perspective that these cost-effectiveness analyses should take. For example, in the UK the National Institute for Health and Clinical Effectiveness (NICE) uses cost-effectiveness analysis to compare the health benefits expected to be gained by using a technology with the health that is likely to be forgone as a result of additional costs falling on the health care budget which displace other activities that improve health. This approach to informing decisions will be appropriate if the objective is to improve health, the measure of health is adequate and the budget for health care can be reasonably regarded as fixed. However, some health care technologies impact on costs in other areas of the public sector and the wider economy or have benefits that extend beyond health outcomes. Other countries therefore recommend a broader “societal” perspective, where these wider effects are formally incorporated into the analyses and decisions (Neumann, 2009). The problem for policy is whether a societal perspective can be reconciled with budgets legitimately set by government, particularly if transfers between sectors are not possible. Even if transfers are possible, it poses the question of how the trade-offs between health, consumption and other social arguments ought to be made.

We aimed to develop a conceptual framework to assess the implications of alternative policies on perspectives for decisions in health care and then to apply this to a series of case studies (Claxton et al, 2010). We set out to (i) undertake a review of UK and international policy relating to the choice of perspective for health care decisions; (ii) develop a formal conceptual framework which clearly distinguishes questions of value and fact when evaluating the implications of suggested policies; (iii) undertake a series of case studies to identify the key issues associated with incorporating alternative perspectives; and (iv) to identify the key issues when considering the policy responses to the problem of appropriate perspective.

Literature review

A review of current UK policy and of policies adopted in other countries revealed considerable variation in the type of perspective claimed, a lack of clarity in what constitutes a societal perspective and little or no consideration of the impact of fixed budget constraints (HM Treasury, 2003; Neumann, 2009; Tarn and Smith, 2004). The justification for the type of perspective adopted was also limited, commonly resting on literature which ignores the implications of fixed budget constraints. This lack of clarity and ambiguous terminology was also reflected in the published cost-effectiveness literature, with many studies claiming to take a societal perspective when in fact their analysis was restricted to the health care system.

A conceptual framework

A conceptual framework was developed that could be used to explore the implications of using alternative perspectives to evaluate health care policies in the presence of fixed budget constraints. The framework allowed the comparison of the net health gained in a budget constrained health care sector (the health gained from the new policy less the health displaced elsewhere as a result of any additional costs displacing other health generating activities) with the net consumption costs or benefits falling on the wider economy. This is equivalent to giving some weight to costs or benefits outside the health care system where the weight is defined by the rate society is willing to trade-off health with other benefits. This relationship is usually referred to as a social welfare function (Gravelle and Rees, 2004). Here we consider a simple two sector economy, health and consumption; however, the analysis can also be widened to consider other budget constrained sectors (e.g. education, see Claxton et al, 2010, pp 40-42). Equation 1 represents the benefits of a new health care technology in monetary terms, whilst Equation 2 represents the benefits of a new health care technology measured in

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terms of health. We consider both to be representations of the “true” social welfare function, where we assume that only effects on health and consumption are of concern and that the rate at which society is willing to trade-off health and consumption is known and acceptable.

$$1) \quad v_h \left(\Delta h - \frac{\Delta c_h}{k_h} \right) - \Delta c_c$$

Or alternatively:

$$2) \quad \left(\Delta h - \frac{\Delta c_h}{k_h} \right) - \frac{\Delta c_c}{v_h}$$

The impact of a new health care technology is measured in terms of Δh , which is the change in health as a result of the new technology in units of health, typically quality adjusted life-years (QALYs), Δc_h , which is the change in health care costs as a result of the new technology, and Δc_c , which represents the change in consumption or private expenditure costs. The social value of health relative to other goods that individuals may consume is given by v_h , which is the willingness to give up consumption for a unit of health. The fixed budget for the health sector is reflected in k_h , which is the cost-effectiveness threshold for health care (i.e. the cost at which a unit of health is foregone at the margin as additional costs to the health care sector displace other health generating activities). We assume that $v_h > k_h$, which implies that the health care system is not overfunded and that individuals would be willing to spend more than the health service would to receive particular treatments.

The first bracket in each equation represents the health gain to the health care system: the health gain from the new technology (Δh) less the health displaced elsewhere as a result of any additional costs of the new technology displacing other health care technologies ($\frac{\Delta c_h}{k_h}$). Equation 1 converts this in to the common numeraire of consumption by weighting it by the willingness to give up consumption for health (v_h) then taking away the net consumption costs (Δc_c). Equation 2 uses the common numeraire of a unit of health and converts consumption costs into health terms. The net consumption costs here are not simply as a result of the consumption impact of the new technology, but also as a result of the consumption impact of any health care technologies which are displaced. Both equations can be seen as a representation of some “true” underlying social welfare function and the true consequences of current budget constraints, although we return later to questions about the interpretation and legitimacy of the value of v_h .

Policies considered

Three alternative policies for economic evaluation of health care were then characterised to reflect arguments espoused in the literature.

- Ignoring the wider costs outside the health sector (as NICE does for technological appraisal policy in the UK), which gives zero weight to benefits and costs outside the health care sector, that is ignoring Δc_c in equations 1 and 2;
- Treating any wider costs as if they fall on the budget constraint (therefore assuming the opportunity cost of all costs is the same as that of those costs falling on the health care budget), which weights benefits and costs falling outside the health care sector equal to those falling within the health sector, that is using k_h in the place of v_h ;
- Ignoring the budget constraint entirely (where the differential opportunity costs of resources as a result of fixed budget constraints are ignored), effectively giving a weight greater than one to costs and benefits outside the health care sector, that is using v_h in the place of k_h .

Marginal and non-marginal changes

These policies were then compared to the “true” function to examine the extent of bias of each policy in two situations (Claxton et al, 2010).

- First, where the impact of new technologies on the NHS budget is only marginal (i.e. only the least valuable existing technologies are displaced and therefore the opportunity cost of resources, as measured by the cost-effectiveness threshold k_h does not change);
- Second, where the impact on the NHS budget is non-marginal (i.e. more and more valuable health care technologies are displaced to fund a new more expensive technology, therefore the opportunity cost of resources is not constant, and the cost-effectiveness threshold will fall).

In the case of marginal changes, each of the three proposed policies creates bias in different directions depending on particular circumstances (e.g. whether the technology has positive or negative consumption costs). No single policy is unequivocally superior to the other two, and in each case the bias could lead to false positive decisions, where a technology that should be rejected is wrongly approved, or false negative decisions, where a technology that should be approved is wrongly rejected (see Claxton et al, 2010, table III, p 24).

As the additional health care costs of new technologies tend to be positive, the repeated application of the decision rules to a sequence of decisions will ultimately have non-marginal effects, i.e. more and more valuable health care will be displaced and the opportunity cost of resources rises and the cost-effectiveness threshold will fall. This raises a number of issues. First, even when using the “true” function, a failure to account for non-marginal effects will lead to biased assessments of cost-effectiveness in favour of new technologies, leading to an unambiguous increase in false positive decisions. Secondly, the informational requirements to fully account for non-marginal effects cannot generally be achieved. Arriving at an estimate of the cost-effectiveness threshold for a point in the past has proved challenging (Martin et al, 2008, 2009) therefore even using the “true” function is likely to prove unfeasible. Finally, even if the effects could be accounted for (i.e. that we knew how the cost-effectiveness threshold changed) there is still a reallocation of resources between health and consumption, which may not be considered desirable. For example, funds which were originally allocated to health care to produce health were now used to produce consumption benefits.

One policy option would be to use the “true” function, but to ignore non-marginal effects. However, this will always have a positive bias in favour of new technologies, and this bias will be greater when non-marginal effects are believed to be large relative to the external (non-health) effects. An alternative would be to ignore any consumption benefits (Policy i) but to treat any consumption costs as if they fall on the NHS budget (Policy ii) which might mitigate this problem; the negative bias in each case tending to offset the positive bias from failing to account for the change in the cost-effectiveness threshold (see Claxton et al, 2010, Table IV, p 35).

Case studies

As part of the project, four case studies were examined using the “true” function to demonstrate that whether a technology offers external benefits or imposes costs will depend on the nature of the technology (e.g. where it primarily affects mortality or quality of life), the type of disease (e.g. acute or chronic), and the type of patient population (e.g. age, gender and employment status) (see Claxton et al, 2010, pp 52-65). In general, findings suggest that there tends to be net consumption benefits to the wider economy associated with effective health care. However, reduced mortality in older patients is associated with net consumption costs. This raises issues about equity as the inclusion of wider effects would seem to favour health care technologies used for younger patients.

The analyses also indicated that some key questions of how to value productivity and financial consequences to patients would need to be resolved if a wider (non-health care) perspective were considered. Estimates of the consumption benefits and costs displaced as a result of treatments being displaced, and not just the health gain from these treatments, would also be required. Robust estimates would require additional analyses as an integral part of the cost-effectiveness appraisal process. In turn, clear guidance would be required to ensure a consistent approach across economic evaluations.

Implications for policy

The question of what is the appropriate perspective for decisions is not simply a technical one, it also poses fundamental questions about social value and the role that economic analysis ought to play in social choice. There are two sets of questions which need to be considered; questions of value and questions of fact.

Questions of value

Taking account of effects outside the health care sector requires some means of valuing health gained and forgone within the health care sector relative to the costs and benefits falling on the wider economy. The rate at which society is willing to trade social arguments, including health and consumption, is commonly referred to as a social welfare function. However, a key question is whether it is possible or desirable to specify such a function that would rank all possible social states for decisions across all sectors. If a complete specification of all social arguments is not possible or if any particular welfare

function does not carry a broad consensus or obvious legitimacy, then attempts to formalise these trade-offs may be undesirable. The resulting prescriptions may well conflict with other objectives of social policy and may lead to socially divisive changes to the health care system; perhaps as illustrated with the case studies, favouring treatments for younger people.

Questions of fact

Extending the perspective beyond the health care sector would also pose a series of empirical questions. First, an estimate of the cost-effectiveness threshold for the health care system is required (Culyer et al, 2007). Second, an agreed estimate of the consumption value of health (the amount of consumption we are willing to give up for health) would also be required. Third, robust estimates of the costs of care not borne by the health care system and the external effects on the wider economy would be needed, requiring robust methods for measuring and valuing them. Finally, it would also be necessary to estimate the wider benefits of the health care technologies which will be displaced by new more expensive treatments: it is not sufficient just to estimate the health which will be displaced (i.e. the cost-effectiveness threshold). Failure to account for the wider benefits displaced could lead to more false positive decisions, where treatments are wrongly approved for use.

Conclusions

Taking account of effects of health care technologies on other areas of the public sector and the wider economy raises both questions of value and fact which cannot be easily answered. Under no circumstances will ignoring the opportunity cost of health care resources as a result of the health care budget constraint be an appropriate response. Taking account of wider effects poses fundamental questions about social value, and without a broad consensus or legitimacy about the way we are willing to trade off the various outcomes, the resulting decisions may lead to undesirable and socially divisive changes to the health care system.

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