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SUPPORT Tools for evidence-informed health Policymaking (STP)

10. Incorporating economic evidence

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Abstract

Background: This article is number 10 in a series of 21 articles on tools for evidence-informed health policymaking, addresses economic considerations. The economic consequences of a policy or programme differ from other impacts (benefits and harms) in several ways. Nevertheless, considerations of the economic consequences of policy options are similar to considerations about other impacts in that policymakers and their staff need to identify important economic consequences, acquire and appraise the best available evidence regarding those consequences, and ensure that economic consequences have been valued appropriately.

Objectives: In this article we suggest four questions that can be considered when assessing the economic consequences of a policy or programme.

Key messages:

- The following questions can be used to guide the assessment of the economic consequences of a policy or programme:
  1. What are the most important economic consequences?
  2. What evidence is there for important economic consequences?
  3. How confident is it possible to be in the economic evidence?
  4. Have the economic consequences been valued appropriately?
- The first step in considering the economic consequences of a policy or programme is the specification of the perspective being taken (e.g. a societal perspective will include all costs, while a narrower perspective will only include costs within the healthcare system). It is also necessary to specify the period of time during which the health outcomes, resource use and other impacts will be considered
- Secondly, all potentially important economic consequences need to be identified within the relevant perspective and time horizons, including changes in the use of healthcare resources, non-healthcare resources, and the time of patients and informal caregivers
- Following this, evidence is needed for each potentially important economic consequence that provides an estimate of the differences in resource use between implementing the policy or programme and the comparator (typically the status quo)
- The quality of this evidence then needs to be assessed
- Finally, appropriate monetary values need to be attached to the differences in resource use

Background

This article is number 10 in a series of 21 articles on tools for evidence-informed health policymaking [1]. It is also the fourth of six articles in the series about characterising the costs and consequences of potential policy and programme options. In this article we suggest four questions that can be considered when assessing the economic consequences of a policy or programme.

The economic consequences of a policy or programme differ from other impacts in a number of key ways [2]:

- **Healthcare costs are typically shared**. For most impacts other than costs, it is usually clear who will be advantaged and who will be disadvantaged, although this may not be the case for all outcomes. For example, an entire community will benefit from a vaccination programme because of the herd effect (the reduced transmission of the disease), or in the case of the widespread use of antibiotics, downstream adverse consequences of drug resistance may occur. Healthcare costs, however, are typically shared by the government, private insurers, employers and patients. Even within a society, the nature of how costs are shared may differ depending on a patient's age (e.g. whether they are under or over 65) or situation (e.g. whether the patient is receiving social assistance)

- **Costs tend to vary widely across jurisdictions**. Drug costs, for example, are largely unrelated to the actual costs of production but more closely related to marketing decisions and national policies. Most medicines under patent cost substantially more in the United States than in Canada [3]. Further, costs may vary widely even within jurisdictions: hospitals or health maintenance organisations may, for instance, negotiate special arrangements with pharmaceutical companies for substantially lower prices than those available to patients or other providers. Costs may also vary widely over time (e.g. when a drug comes off patent)

- **Opportunity costs vary widely across jurisdictions**. Even when resource use remains constant, resource implications may vary widely across jurisdictions. A year's supply of a very expensive drug may pay one nurse's salary in the United States, six nurses' salaries in Eastern Europe, and 30 nurses' salaries in Africa. Thus, what one can buy with the resources saved if one foregoes the purchase of a drug (i.e. the 'opportunity cost') – and the health benefits achievable with those expenditures – may differ significantly [4]

- **Stakeholders have different perspectives regarding the envelope in which they are considering opportunity costs**. Individual patients may only be interested in their out-of-pocket costs or have different views about risk sharing and who should bear the costs of healthcare. Hospital or district managers, however, operating within fixed budgets may consider the cost of an intervention, programme or policy relative to other possible uses for that money or opportunities available to shift resources from one use to another. Similarly, a Minister of Health may be primarily interested in healthcare costs and the healthcare budget, while other policymakers may apply a broader perspective and consider the overall government budget, including non-healthcare expenditures and tax increases or reductions

- **Conflicting interests are common in relationship to economic consequences**. The economic interests of health professionals or industry (who typically want to earn as much

But despite these differences, considerations of the economic consequences of policy options are similar to considerations of other impacts given that policymakers and their staff need also to identify important economic consequences, acquire and appraise the best available evidence regarding those consequences, and ensure that economic consequences have been valued appropriately [5-7]. However, due to differences between the economic consequences and other impacts, consideration of costs presents special challenges [2, 8].

Questions to consider

The following questions can be used to guide the assessment of the economic consequences of a policy or programme:

1. What are the most important economic consequences?
2. What evidence is there for important economic consequences?
3. How confident is it possible to be in the economic evidence?
4. Have the economic consequences been valued appropriately?

1. What are the most important economic consequences?

Health policies and programmes entail the use of resources, and human resources such as time, in particular. When considering which economic consequences are important, policymakers should first focus on resource use rather than costs (see Box 1, for example). Examples of the potentially important economic consequences that should be considered include changes in the use of healthcare resources, non-healthcare resources, and patient and informal caregiver time (such as those listed in Box 2).

Changes in the productivity of patients may also be important. People with AIDS, for instance, may place a high value on being able to work and earn money, but the process of measuring and valuing actual changes in productivity is controversial [9]. Like others [2, 8, 10], we suggest that such changes in productivity need to be considered as components of the intrinsic value of changes in health status, and should not be included as resource consequences but only as health outcomes.

On the other hand, some outcomes, such as hospitalisations or days in hospital, can be considered as important in their own right as well as a component of resource use.

When deciding which economic consequences are potentially important it is necessary to specify the viewpoint from which recommendations are being made. One option is to adopt a societal perspective: this is a broad viewpoint that includes all important healthcare and non-healthcare resources [2]. This option has the advantage of ensuring that the issue of who pays does not determine whether resource use is included.

Policymakers, however, may sometimes have a remit to make decisions about the use of resources within a healthcare system. In such instances, costs or savings outside of the healthcare system would not be included. This would not preclude a consideration of the impacts of a healthcare policy or programme on, for example, social services or crime, in

addition to health outcomes. But any costs or savings associated with those impacts would not be relevant to the healthcare budget, unless there was a transfer of funds (e.g. from criminal justice to health).

It is also necessary to specify the time horizon for a policy decision (i.e. the period of time for which health outcomes, resource use and other impacts will be considered).

2. What evidence is there for important economic consequences?

Evidence must be found for each potentially important economic consequence and an estimate provided of the difference in resource use between implementing the policy or programme on one hand, and the comparator (typically the status quo) on the other (see Box 3 for example). As with health outcomes and other impacts, a comparison is needed, regardless of whether this is implicit or explicit. So, for example, when considering the economic consequences of scaling up the use of artemisinin combination therapy (ACT) for uncomplicated falciparum malaria, increased expenditures on ACT (and corresponding changes in the use of other anti-malarials) must be compared to current expenditures on ACT and other anti-malarials (the status quo). Other economic consequences of scaling up the use of ACT, such as training or providing incentives to community health workers to deliver ACT must also be compared to the status quo (which may vary from setting to setting). Similarly, any savings resulting from scaling up the use of ACT (e.g. fewer hospitalisations) must also be compared to the status quo. If two competing options for scaling up the use of ACT were being considered, it would be necessary to compare the economic consequences of both of these to each other (either directly or indirectly).

Systematic reviews, randomised trials and observational studies provide evidence of economic consequences. Such evidence can be published in, or separately from, clinical studies or impact evaluations. The use of resources in a specific setting can be retrieved from national or local databases, such as drug use from prescription databases or hospitalisations from hospital databases [11].

Evidence of resource use may, however, come from different sources than evidence of health benefits. This may be the case because:

- Trials or impact evaluations (and systematic reviews of these) do not fully report resource use
- Trials and impact evaluations may not fully reflect the circumstances – and thus the resource use – in the setting where a policy decision must be made, and
- The relevant resource use may extend beyond the duration of the trial or impact evaluation

Evidence of economic consequences should be in natural units, such as visits, hospitalisations or the number of doses of ACT. There are two reasons for this. Firstly, when only total costs are reported (i.e. the number of units of a resource multiplied by the unit cost of the resource), resource use cannot be separated from unit costs, which might vary considerably between settings and over time. Secondly, without information about resource use it is difficult to make judgements about the validity and the applicability of the evidence.

Unfortunately, studies sometimes report costs but not the underlying levels of resource use. For example, an economic evaluation of magnesium sulphate for pre-eclampsia reported total cost, but not the resource use for magnesium sulphate, resources for administering magnesium

sulphate and other hospital resources [12]. Differences in costs could be due to differences in underlying levels of resource use, differences in unit costs, or both.
Often it is not possible to find evidence for components of resource use that are important for policy decisions. For example, a guideline panel convened by WHO to develop recommendations for the prevention of postpartum haemorrhage found very limited evidence of the economic consequences of using oral misoprostol compared to intramuscular oxytocin.[Error! Bookmark not defined.] They considered hospitalisation, personnel time and drugs to be potentially important resource consequences but no evidence was found for the first two types of resources. Thus the economic consequences of these two options for preventing postpartum haemorrhage are very uncertain.

3. How confident is it possible to be in the economic evidence?

The quality of evidence for economic consequences must be assessed for each important resource consequence (see Box 4 for example). This is because the quality of evidence may be better for some economic consequences (e.g. drug use) than for other consequences (e.g. personnel time). The criteria for assessing the quality of evidence for resource use are largely the same as those for health outcomes [2, 7, 8, 13]. These include: assessing the study design and other study limitations (i.e. the risk of bias), the precision of the estimate, the consistency of the results; the directness of the evidence, and the risk of publication bias. Factors that often lower the quality of economic evidence – i.e. those that result in less confidence in estimates of economic consequences – include:

- The unavailability of data due to resource use not having been measured or reported, or reported only as cost estimates (in other words, without the data upon which those estimates were based)
- Weak (observational) study designs
- Indirectness due to uncertainty about the transferability of economic evidence from one setting to another, and
- Inadequate follow-up periods so that it is necessary to extrapolate in order to estimate resource consequences beyond the length of available studies

Typically when estimating the cost-effectiveness of a policy or programme, many assumptions must be made. Economic models that are used to estimate cost-effectiveness are valuable given that they can help to make such assumptions explicit. They also allow for sensitivity analyses that test how robust estimates of cost-effectiveness are in relation to those assumptions. It should be noted, however, that the various checklists used to assess the quality of economic analyses in the healthcare literature are not constructed to assess the quality of the evidence upon which the analyses were based [14].

Moreover, although published cost-effectiveness analyses can be helpful, particularly for developing a model, they are often of limited value to policymakers. This is because the assumptions made and the unit costs that were used may not be transferable from the setting where the analysis was done to the one where a decision must be made. They are also often flawed, and without details of the full model it is difficult to make informed judgements about either the quality of the evidence or its applicability [2, 8, 15, 16].

4. Have the economic consequences been valued appropriately?

Attaching appropriate monetary values to resource use can help policymakers to value resource use consistently and appropriately (see Box 5 for example). In principle, the values should reflect opportunity costs – that is, the benefits forgone by diverting the resources from the next best, alternative use [17].
Cost calculations based on reliable databases or data sources in the same jurisdiction are the most reliable sources of data for unit costs [18]. Monetary valuations of resource use should be made with data that are specific to the context where a policy decision must be made, using transparent and locally-relevant unit costs. However, if this is not possible, purchasing power parity (PPP), exchange rates and inflation factors could be used to assist the interpretation of monetary valuations from other settings or times [19]. In a study estimating the cost of cervical cancer screening in five developing countries [20], for example, unit cost data were derived from more than one year, and therefore country specific deflators were used to adjust all costs to the same price year. Further, to aid cross-country comparability, PPP exchange rates were used to convert costs expressed in local currency units to dollars, with both measured according to the relevant values in the price year 2000.

Discounting is used in economic evaluations to adjust for social or individual preferences over the timing of costs and health benefits. This means that less weight is given to costs or benefits that occur further in the future than to those expected imminently. Recommended discount rates differ between countries, and are often varied in sensitivity analyses.

When costs are presented, these should be reported using the appropriate discount rate for the context where the policy decision must be made. Data used to calculate the discounted costs – including quantities of all resource items, unit costs and the discount rate – should be transparent, so that an assessment of the validity and applicability or appropriateness of each component is possible.

Resources

Useful documents and further reading

- Guyatt GH, Oxman AD, Kunz R, Jaeschke R, Helfand M, Vist GE, Schunemann HJ, and the GRADE Working Group. Incorporating considerations of resource use. BMJ 2008; 336:1170-3.

- Brunetti M, Oxman AD, Pregno S, Lord J, Shemilt I, Vale L, et al. GRADE guidelines: 10. Special challenges – resource use. J Clin Epidemiol. In press.

Links to websites

- Campbell & Cochrane Economics Methods Group. http://www.med.uea.ac.uk/research/research_econ/cochrane/cochrane_home.htm

- GRADE Working Group. http://www.gradeworkinggroup.org/index.htm

- International Health Economics Association http://www.healtheconomics.org/

- Office of Health Economics, UK. http://www.ohe.org/page/index.cfm

Box 1. Example: Identifying potentially important economic consequences for a national programme of outreach visits to improve prescribing for hypertension

Educational outreach visits (personal visits to healthcare professionals in their own settings) have been found to have relatively consistent and small, but potentially worthwhile, effects on prescribing [21]. These visits were found to increase the use of thiazides, in adherence with clinical practice guidelines, from 11% to 17% among patients with newly diagnosed hypertension in a randomised trial in Norway [22]. To determine whether this improvement was worthwhile (in relation to the cost of a national outreach programme), the following uses of resources were considered [23]:

- Development of software (used to audit medical records and provide feedback to physicians)
- Training outreach visitors (pharmacists)
- Printed materials
- Travel for the pharmacists doing the outreach visits
- The pharmacists' time
- Administrative time (e.g. making appointments for the outreach visits)
- Physicians' time (for the outreach visits)
- Technical support
- Drug expenditure
- Patient visits
- Laboratory tests

Box 2. Examples of potentially important economic consequences*

1. Changes in use of healthcare resources

- Policy or programme
  - Human resources/time
  - Consumable supplies
  - Land, buildings, equipment
- Additional (or fewer) hospitalisations, outpatient visits or home visits
- Additional (or less) use of laboratory tests or examinations
- Paid transportation (e.g. emergency transportation)

2. Changes in use of non-healthcare resources

- Transportation to healthcare facilities
- Special diets
- Social services (e.g. housing, home assistance, occupational training)
- Home adaptation
- Crime (e.g. theft, fraud, violence, police investigation, court costs) in relation to drug or alcohol abuse

3. Changes in use of patient and informal caregiver time

- Outpatient visits
- Hospital admissions
- Time of family or other informal caregivers

4. Changes in productivity

- We suggest that changes in productivity and the intrinsic value of changes in health status should be captured in the value or importance attached to health outcomes and should not be included as resource consequences.

* Adapted from Luce and colleagues [10]

Box 3. Example: Finding evidence for economic consequences

The following data sources were used to estimate the difference in resource use between a programme of outreach visits (targeted at all general practitioners in Norway) and no programme (the status quo) [23].

Resources	Data sources
Development of software	Invoices, estimates of time spent
Training of outreach visitors	Estimate of time spent; invoices
Printed materials	Invoice
Travel	Record of travel days, estimate of travel distances
Pharmacists' time	Record of number of visits and days spent on visits
Administrative time	Records and estimates of time expenditure
Physicians' time	Record of length of outreach visit and number of physicians present
Technical support	Records of invoices
Drug expenditure	Medical records
Patient visits	Medical records
Laboratory tests	Medical records

Because data were only collected for one year and from 139 practices (501 physicians), half of which received outreach visits and half of which did not) it was necessary to extrapolate the use of resources beyond one year and to the rest of the country.

Box 4. Example: Assessing the quality of evidence for economic consequences

The quality of the evidence for the estimates of difference in resource use between a programme of outreach visits (targeted at all general practitioners in Norway) and no programme (the status quo) varied.

Resources	Data sources
Development of software	High quality
Training of outreach visitors	High quality
Printed materials	High quality
Travel	Moderate quality*
Pharmacists' time	Moderate quality*
Administrative time	High quality
Physicians' time	Moderate quality*
Technical support	High quality
Drug expenditure	Moderate to low quality†
Patient visits	Moderate to low quality†
Laboratory test (potassium)	Moderate to low quality†

* The evidence for travel, pharmacists' time and physician time was of moderate quality. This was because of uncertainty about the extrapolation of data from practices in the trial to the rest of the country

† The evidence for drug expenditures, patient visits and laboratory tests was of moderate to low quality. This was because of uncertainty about the extrapolation of data from the trial to the rest of the country and, in addition, because of extrapolation beyond one year (the duration of the trial) to estimate the economic consequences over several years for a programme targeted at all general practitioners in the country

Box 5. Example: Attaching monetary values to economic consequences

The following data sources were used to estimate the monetary value of differences in resource use between a programme of outreach visits (targeted at all general practitioners in Norway) and no programme (the status quo) [23].

Variable	Data sources for monetary values
Development of software	Invoices, salary payments
Training of outreach visitors	Salary payments
Printed materials	Invoice
Travel	Travel invoices
Pharmacists' time	Salary payments
Administrative time	Salary payments, standard estimates for overheads, office rental figures
Physicians' time	Standard tariff for interdisciplinary meetings
Technical support	Invoices
Drug expenditure	"Felleskatalogen 2003" (a list of drugs and prices)
Patient visits	Standard tariff for consultation
Laboratory test (potassium)	Standard tariff

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