Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Introduction to Module 4

Luke Vale, Senior Research Fellow, Health Economics Research Unit and Health Services Research Unit, University of Aberdeen, assisted Moira Napper in development of this module.

This module:

- Explains why health economic evaluations require appraisal
- Explains each of the key areas to consider in the critical appraisal of health economic evaluation studies
- Helps you appraise a selected paper

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Why should we appraise health economic evaluations?

We know from Module 3 that the quality of published health economic evaluations is variable and that health care decision makers need to be sure that the evidence on efficiency is reliable and can be applied to their own situations.

We also learned that the reliability of study findings must be checked with regard to:

- the **quality** of the methodology
- the **accuracy** of the reporting - is the analysis really a FULL economic evaluation?
- whether the **results** of an economic evaluation **can be generalized** to another setting

The process for critically appraising health economic evaluation studies

Critical appraisal of studies can be assisted by **referral to a standard checklist**. Fortunately, there are a number of checklists available that offer **guidance** for the conduct, reporting and appraisal of health economic evaluations. (see also Module 3)

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

For the purposes of this online course, the authors have selected the Drummond 10-point checklist¶ upon which the *British Medical Journal* guidelines† for peer-review and reporting of economic studies are based.

¶ Drummond M et al. Methods for the economic evaluation of health care programmes. 2nd ed. Oxford. Oxford University Press. 1997
† Drummond M, Jefferson T. Guidelines for authors and peer-reviewers of economic submissions to the BMJ. *BMJ* 1996;313:275-283

Previous Next

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

About these Modules

- Home
- Introduction and Purpose
- Index

The Modules

Modules Available for Study:

- Module 1, Part 1: **Scope of Health Economics** Module 1, Part 2: **Key Information Sources**
- Module 2: **Sources and Characteristics of Information**
- Module 3: **Identification and Retrieval of Published Health Economic Evaluations**
- Module 4 : **Principles of Critical Appraisal of Health Economic Evaluations**

Related Content:

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas to consider in the critical appraisal of health economic evaluation studies

As you begin your critical appraisal of a health economics evaluation study, keep the following in mind:

1. The **question (**to discussion) addressed by the study
2. The **estimation of resource use and costs** (to discussion)
3. The **estimation of benefits** (to discussion)
4. **Discounting** (to discussion); and
5. **Sensitivity analysis** (to discussion)

Previous Next

About these Modules

- Home
- Introduction and Purpose
- Index

The Modules

Modules Available for Study:

- Module 1, Part 1: **Scope of Health Economics** Module 1, Part 2: **Key Information Sources**
- Module 2: **Sources and Characteristics of Information**
- Module 3: **Identification and Retrieval of Published Health Economic Evaluations**
- Module 4 : **Principles of Critical Appraisal of Health Economic Evaluations**

Related Content:

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas for critical appraisal - 1. The question

We need to ask ourselves two questions about the question the economic evaluation study seeks to address:

a) Is the type of analysis used appropriate to the question?
b) What is the perspective of the analysis?

These questions are related as they determine the **type of analysis** which should have been performed and the **type of costs and benefits** which should be collected. Each question is broken down into several sub-questions, presented below.

1a) Is the type of analysis appropriate to the question asked?

Economic evaluation can be used to assess:

The best way of achieving a given goal within a given budget. This is a technical efficiency question that can be measured by cost-effectiveness analysis or cost-utility analysis.

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

Is it worthwhile achieving a given goal?

> This is an **allocative efficiency** question that can be measured by **cost-utility analysis** or **cost-benefit analysis**.

The crucial point for appraisal is whether the correct methodology has been chosen for a specific question.

There are **three basic types** of economic evaluation methodology:

- cost-effectiveness analysis (CEA)
- cost-utility analysis (CUA)
- cost-benefit analysis (CBA)

Cost-effectiveness analysis (CEA)

CEA relates costs to a single clinical or natural measure of effectiveness; i.e., a unidimensional outcome, e.g., pain reduction, activities of daily living.

CEA is best suited to measuring technical efficiency as it is difficult to compare treatments with different outcomes.

CEA can sometimes be used to provide limited information on allocative efficiency through a ratio of extra cost to extra benefit produced (incremental cost-efficiency analysis).

Cost-utility analysis (CUA)

Cost-utility analysis relates costs to a multidimensional measure of effectiveness which takes into account the valuation of benefits; i.e., a measure of **utility**.

CUA can be used to measure technical efficiency.

CUA can be used for allocative efficiency but only within the health care sector where health care costs only are included.

Cost-benefit analysis (CBA)

CBA relates costs to a valuation of benefits in commensurate (having a common or equal unit of measure), usually monetary, terms.

CBA can be used to measure both technical and allocative efficiency questions. It can be measured either within the health care sector or

across other sectors of the economy.

1b) What is the perspective of the analysis?

Perspective is important as it determines which costs and benefits are collected.

Possible perspectives that should be considered are:

- a specific provider or provider institution
- a patient or patient group
- a health care purchaser (or third party payer)
- society at large

As a general rule CEA and CUA require only **health care costs** to be collected.

CBA requires **all costs and benefits** to be collected, no matter on whom they fall.

See Ex. 1 in Test Questions at end of module

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas for critical appraisal - 2. The assessment of resource use and cost

Two questions need to be addressed in relation to how the economic evaluation has assessed resource use and cost:

a) Are the main areas of resource use identified?
b) Are the appropriate costs measured?

It is important to remember that **costs here do not equate with expenditure**. Economic cost, that is, opportunity costs are the benefits of opportunities forgone; i.e., the best possible use of the same resources .

2a) Are the main areas of resource use identified?

The main areas of resource use which may require specific identification and measurement of costs are:

- Health care resources
- Other related services
- Clients and their families
- Time lost from usual activity

This is not an exhaustive list but illustrates the main categories.

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

Examples of **health care resources** include (but are not limited to) staffing, consumables such as supplies and equipment, overheads such as heating, lighting, cleaning, laundry services etc., and capital such as land, buildings and major items of equipment.

Other related services costs include resources associated with community, ambulance and voluntary services. As with health care resources they may be categorized as staffing, consumables, overheads, and capital.

Resources used by clients and their families may take the form of inputs to treatment, e.g., informal care or expenses, such as transport costs.

Time lost from usual activity may take the form of time away from work, loss of leisure time, or unpaid work.

See Ex. 2 in Test Questions at end of module

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

About these Modules

- Home
- Introduction and Purpose
- Index

The Modules

Modules Available for Study:

- Module 1, Part 1: **Scope of Health Economics** Module 1, Part 2: **Key Information Sources**
- Module 2: **Sources and Characteristics of Information**
- Module 3: **Identification and Retrieval of Published Health Economic Evaluations**
- Module 4 : **Principles of Critical Appraisal of Health Economic Evaluations**

Related Content:

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas for critical appraisal - 2 continued
2b) are the appropriate costs measured?

The costs reported in an economic evaluation may suffer from a number of problems which require consideration at appraisal. These problems are:

- effects of **inflation** (link to content),
- **double counting** (link to content)
- **un-thinking acceptance of market values** (link to content)

The key point to consider here is, has the economic evaluation attempted to correctly identify the **opportunity cost** of the resources used?

Effects of Inflation

To adjust for the effects of inflation health care costs should be **counted in a base year.** Where costs are incurred over a period of years it is **important to correct for the effects of inflation**. Finally, adjustment for inflation is required to provide real resource cost.

Here is an example of how costs are adjusted for inflation. The table shows alternative treatments for a hypothetical condition. The alternatives include surgery or drugs.

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

Hypothetical example of adjusting costs to base years* (costs in $ per person per annum)

	Costs arising during:			
Alternatives	**Year 0**	**Year 1**	**Year 2**	**Total**
Surgery	3000			3000
Drug (unadjusted for inflation)	1000	1050	1102.5	3152.5
Drug (adjusted to Year 0 prices)	1000	1000	1000	3000

Note: The rate of inflation is 5% per annum

* Adapted from: Donaldson C, Shackley P. Economic studies. In: *Oxford Textbook of Public Health*. 3rd ed. Detels R et al. (eds.). Oxford. Oxford University Press. 1997.

Each treatment has the same effect but different costs. With an inflation rate of 5% a cost of $1050 occurring in one year's time is equivalent to $1000 ($1050/1.05) now. With an inflation rate of 5% a cost of $1102.5 occurring in two year's time is equivalent to $1000 ($1102.5/1.05^2) now.

By **adjusting costs for the rate of inflation** the two treatments are shown to be **equally efficient** in terms of resources used.

Use of unadjusted costs would lead to the conclusion that surgery is more efficient than drug therapy as it would appear less costly.

Double Counting

Counting the same cost twice - **double-counting** - is a potential hazard in economic evaluation. An example of double-counting is counting the cost of a surgeon's time for an operation when that cost is already included in the fee.

Un-Thinking Acceptance of Market Values

The last consideration is the **un-thinking acceptance of market values**. The market value of a resource may not be an adequate reflection of **opportunity cost**.

An example is **voluntary care** - the market price is zero but there is an opportunity cost in terms of the alternative ways in which the carer could have utilized the time. A value would have to be assigned/ attributed, perhaps based on the salary of a paid caregiver.

See Ex. 3 in Test Questions at end of module

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

Health Economics Information Resources: A Self-Study Course: Module 4

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas for critical appraisal - 3. The assessment of benefits

Two questions need to be addressed in relation to the measurement of benefits in an economic evaluation:

a) Is the measure of benefit appropriate?
b) Is the method used to obtain clinical effect data valid?

3a) Is the measure of benefit appropriate?

The **main difference** between the different types of economic methodologies is in **how** the **benefits** are **measured and valued**. Here we look at cost-effectiveness analysis (CEA), cost-utility analysis (CUA), and cost-benefit analysis (CBA) in terms of their **strengths** and **limitations**.

Economic evaluation - identification and measurement of benefits		
Evaluative technique	**Benefits**	**Unit of Measurement**

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

Cost-effectiveness analysis	**Quantity of Life OR Quality of Life**	Life years gained
Cost-utility analysis	**Quantity + Quality of Life**	Health Years; e.g., QALYs, HYEs
Cost-benefit analysis	**Quantity + Quality of life** (may include some non-health aspects	Money; e.g., human capital, willingness to pay

Cost-effectiveness analysis (CEA) is relatively easy to undertake and the benefits are measured as a single unidimensional outcome; however, other potentially important outcomes may be ignored. This unidimensionality may result in drawing erroneous conclusions from CEA.

Cost-utility analysis (CUA) has its own strengths and limitations. CUA measures more aspects of health and well-being than a single natural unit. **QALYs** and **HYEs** assume that the only potential benefit from health care is improvement in health-related quality of life. The different methods available to estimate QALYs may not provide identical results and CUA is more complex to undertake than CEA.

Cost-benefit analysis (CBA) is the only form of evaluation that addresses whether the benefits of an intervention exceed its costs. **Willingness To Pay** allows measurement of potential benefits of health care other than just health gain. It is difficult to assign monetary values to health care benefits. Lastly, CBA can be very complex, and expensive, to undertake.

3b) Is the method used to obtain clinical data valid?

The key questions to consider here are: A) do the methods used to provide **measures of clinical effectiveness** on which the evaluation was based provide **unbiased estimates**? and B) what is the **underlying design** of the clinical effectiveness study?

The accepted hierarchy for design of studies to assess clinical effectiveness applies; i.e., meta-analysis, individual RCTs etc.*

* Devereaux PJ, Yusuf S. The evolution of the randomized controlled trial and its role in evidence-based decision making. *J Intern Med*. 2003 Aug;254(2):105-13.

See Ex. 4 in Test Questions at end of module

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

Health Economics Information Resources: A Self-Study Course: Module 4

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas for critical appraisal - 3. The assessment of benefits

Two questions need to be addressed in relation to the measurement of benefits in an economic evaluation:

a) Is the measure of benefit appropriate?
b) Is the method used to obtain clinical effect data valid?

3a) Is the measure of benefit appropriate?

The **main difference** between the different types of economic methodologies is in **how** the **benefits** are **measured and valued**. Here we look at cost-effectiveness analysis (CEA), cost-utility analysis (CUA), and cost-benefit analysis (CBA) in terms of their **strengths** and **limitations**.

Economic evaluation - identification and measurement of benefits		
Evaluative technique	**Benefits**	**Unit of Measurement**

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

Cost-effectiveness analysis	**Quantity of Life OR Quality of Life**	Life years gained
Cost-utility analysis	**Quantity + Quality of Life**	Health Years; e.g., QALYs, HYEs
Cost-benefit analysis	**Quantity + Quality of life** (may include some non-health aspects	Money; e.g., human capital, willingness to pay

Cost-effectiveness analysis (CEA) is relatively easy to undertake and the benefits are measured as a single unidimensional outcome; however, other potentially important outcomes may be ignored. This unidimensionality may result in drawing erroneous conclusions from CEA.

Cost-utility analysis (CUA) has its own strengths and limitations. CUA measures more aspects of health and well-being than a single natural unit. **QALYs** and **HYEs** assume that the only potential benefit from health care is improvement in health-related quality of life. The different methods available to estimate QALYs may not provide identical results and CUA is more complex to undertake than CEA.

Cost-benefit analysis (CBA) is the only form of evaluation that addresses whether the benefits of an intervention exceed its costs. **Willingness To Pay** allows measurement of potential benefits of health care other than just health gain. It is difficult to assign monetary values to health care benefits. Lastly, CBA can be very complex, and expensive, to undertake.

3b) Is the method used to obtain clinical data valid?

The key questions to consider here are: A) do the methods used to provide **measures of clinical effectiveness** on which the evaluation was based provide **unbiased estimates**? and B) what is the **underlying design** of the clinical effectiveness study?

The accepted hierarchy for design of studies to assess clinical effectiveness applies; i.e., meta-analysis, individual RCTs etc.*

* Devereaux PJ, Yusuf S. The evolution of the randomized controlled trial and its role in evidence-based decision making. *J Intern Med*. 2003 Aug;254(2):105-13.

See Ex. 5 in Test Questions at end of module

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Key areas for critical appraisal - 5. Sensitivity analysis

Economic evaluations are **models** which attempt to capture and summarize reality. **These models use assumptions and estimates**.

Sensitivity analysis tests the robustness of the conclusions by repeating the comparison between inputs and consequences while varying the assumptions used. Given that there will be a degree of **uncertainty** about some elements of any economic evaluation, sensitivity analysis assists in judging how **robust** the conclusions will be.

The **main candidates for sensitivity analysis** in economic evaluation are:

- **values not measured** - because they are difficult to collect
- **imputed (assigned, attributed) values** - because the true opportunity cost is not known
- **the discount rate** - because time preference may be important but the degree of importance is not known
- **the confidence limits of a statistical estimate of a variable**
- **estimations of survival or quality of life** - particularly in the extrapolation of outcomes

Summary

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

In this module you have learned that:

- The **quality** of published health economic evaluations is **variable and their reporting can be inadequate**
- Health care decision makers need to be sure that the **evidence on efficiency is reliable** and **can be applied to their own situation**
- **Checklists** for quality assessment which cover the key areas for critical appraisal **are widely available**
- The uncritical use of economic evaluation study results should be avoided - **ALWAYS CRITICALLY APPRAISE**!

See Ex. 6 in Test Questions at end of module

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

About these Modules

- Home
- Introduction and Purpose
- Index

The Modules

Modules Available for Study:

- Module 1, Part 1: **Scope of Health Economics** Module 1, Part 2: **Key Information Sources**
- Module 2: **Sources and Characteristics of Information**
- Module 3: **Identification and Retrieval of Published Health Economic Evaluations**
- Module 4 : **Principles of Critical Appraisal of Health Economic Evaluations**

Related Content:

Finding and Using Health Economics Information Resources

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Sample critical appraisal exercise introduction - An economic evaluation of thrombolysis in the community

This part of the tutorial provides a sample appraisal of a published economic evaluation study using the fundamental principles as described earlier in Module 4 and using the Drummond 10-point checklist . Open the Checklist in one window and the article, below, in another. Try the analysis yourself and then read on to get the responses from the author of this module.

The study reference is:

Vale L et al. An economic evaluation of thrombolysis in a remote rural community. *British Medical Journal* 1997;314:570-572.

Here is a link to the full text of the paper.

Note: A quality assessment of the paper together with a structured abstract is available on the **NHS Economic Evaluation Database*** (Document 130664). The abstract prepared with some minor amendments for the purposes of this exercise is available at the site. Click on the document number above.

*see also Module 1

Previous Next

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Sample critical appraisal exercise: An economic evaluation of thrombolysis in the community

1. Was a well-defined question posed in answerable form?

1.1. Did the study examine both costs and effects of the service (s) or program(s)?

Yes.

1.2. Did the study involve a comparison of alternatives?

Yes.

1.3. Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?

Yes, the viewpoint is given as the UK National Health Service (the purchaser and provider of health care).

2. Was a comprehensive description of the competing alternatives given (i.e., can you tell who did what to whom, where, and how often)?

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

2.1. Were there any important alternatives omitted?

Possibly. There may be other forms of thrombolysis or other forms of intervention, such as surgery.

2.2. Was (should) a *do-nothing alternative be considered?**

No, acute myocardial infarction will always be treated if possible.

* A 'do nothing' alternative might be, for example, the introduction of a diagnostic test for a disease/condition for which there has been no previous definitive diagnostic test.

3. Was the effectiveness of the program or services established?

3.1a. Was this done through a randomized controlled trial (RCT)?

Yes, the effectiveness data came from a single RCT.

3.1b. If so, did the trial protocol reflect what would have happened in regular practice?

Yes, the trial protocol reflected what would happen in regular practice for the setting, but normally streptokinase is the standard hospital therapy.

The study states that before the start of the trial the general practitioners involved routinely attended patients with suspected AMI. The follow-up of 1, 2.5, and 4 years provides useful information.

3.2. Was the effectiveness established through an overview of clinical studies?

No. Effectiveness is based on data from a single RCT.

3.3. Were observational data or assumptions used to establish effectiveness? If so, what are the potential biases in results?

No observational data was used – the effectiveness data was from **GREAT** alone with the assumption that GP attends ALL suspected AMI cases and that they (the GP) arrive within usual time of patient traveling to hospital, assessment for treatment etc.

Anistreplase, the drug used in GREAT, has the same effectiveness as streprokinase, the drug used in hospitals.

4. Were all the important and relevant costs and consequences measured accurately in appropriate physical units (e.g., hours of nursing time, number of physician visits, lost work-days, gained life years)?

4.1. Was the range wide enough for the research question at hand?

No, long-term costs and consequences other than survival not considered.

4.2. Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of patients and third-party payers. Other viewpoints may also be relevant depending upon the particular analysis.)

Yes. The relevant viewpoint here is the health care purchaser, in this case the NHS. Only treatment costs are included in analysis. There are no direct patient costs or 'other sector' costs. Indirect costs, e.g., productive costs/ activity (e.g., housework) not included.

4.3. Were the capital costs, as well as operating costs, included?

Yes. The capital costs of the ECG and defibrillator were included.

5. Were costs and consequences measured accurately in appropriate physical units (e.g., hours of nursing time, number of physician visits, lost work-days, gained life years)?

5.1. Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?

Although not individually itemized, there is nothing to suggest that identified items were omitted from measurement, i.e., drug costs, labor costs, capital costs. Every patient has same unit cost applied.

5.2. Were there any special circumstances (e.g., joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?

For the purposes of the trial it was accepted that all the GPs involved had undergone the appropriate training and acquired an ECG and defibrillator - these already attend suspected AMI cases.

The cost in terms of length of time of GP attendance are included in the low cost estimate and this is made explicit, as is the GP time cost and capital cost included in the high estimate, i.e., special circumstances where the GP does not already have these capital items.

Previous Next

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Sample critical appraisal exercise: An economic evaluation of thrombolysis in the community, continued...

6. Were costs and consequences valued credibly?

6.1. Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy-makers' views and health professionals' judgments)

Market values used for drug and capital costs and year stated as 1996 (in Table 1). Labor costs, in this case GP time, based on recommended income scales.

No year or reference is given.

6.2. Were market values employed for changes involving resources gained or depleted?

Market values for capital costs were adjusted using a discount rate of 6%. Adjustment for inflation for costs not required here as they all occur at the same time.

6.3. Where market values were absent (e.g., volunteer labor), or market values did not reflect actual values (such as clinic

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

space donated at a reduced rate), were adjustments made to approximate market values?

Not applicable.

6.4. Was the valuation of consequences appropriate for the question posed (i.e., has the appropriate type or types of analysis – cost-effectiveness, cost-benefit, cost-utility – been selected)?

Consequences were measured as life years saved; i.e., outcome measured as survival at 4 years - this is appropriate for an incremental cost-effectiveness analysis.

Consequences measured as quantity of life but consequences were not weighted by quality of life and therefore not best suited to evaluation of an allocative question.

7. Were costs and consequences adjusted for differential timing?

7.1. Were costs and consequences that occur in the future 'discounted' to their present values?

Capital costs discounted at 6%. Discounting not applicable to the other costs included because they occur at the same time.

7.2. Was there any justification given for the discount rate used?

No justification provided for the discount rate used. 6% was the UK recommended rate.

8. Was an incremental analysis of costs and consequences of alternatives performed?

8.1. Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits, or utilities generated?

Yes. This gives a meaningful comparison in terms of the additional cost and effect of one intervention over another.

A value judgment will be required to assess whether the extra unit of outcome is worthwhile. This provides some information in relation to whether the extra benefit is

worth the extra resources.

9. Was allowance made for uncertainty in the estimates of costs and consequences?

9.1 If data on costs and consequences were stochastic (randomly determined sequence of observations), were appropriate statistical analyses performed?

The only stochastic tests were performed on consequences; i.e., probability of survival at 4 years - confidence intervals. In this case the the additional probability of survival at 4 years is 11% (95% CI* 1% to 22%).

This suggests that the true value of additional probability of survival at 4 years will be found to be between 1% and 22%, 95 out of a hundred times.

* CI = Confidence Interval

9.2. If a sensitivity analysis was employed, was justification provided for the range of values (or for key study parameters)?

The study explored the impact of assumptions with respect to resource use. Low and high cost estimates provided around assumptions of time cost for GP attendance and capital expenditure.

Lower estimate based on assumption that no capital expenditure was necessary and that GPs already attended patients with suspected AMI.

Higher estimate based on assumption that an ECG and defibrillator would need to be purchased and that the GP did not previously attend patients with suspected AMI.

Capital costs were the only variable tested. Other variables which could have been tested include thrombolytic drug costs and GP time.

9.3. Were the study results sensitive to changes in the values (within the assumed range for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?

Yes, the results were sensitive to the change in values.

Extreme values of marginal cost of life saved at 4 years, i.

e., £1990 - £88100, were not particularly precise. This is because the trial was originally designed to detect changes in survival, not determine cost-effectiveness.

10. Did the presentation and discussion of study results include all issues of concern to users?

10.1. Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (e.g., cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?

Conclusions of the analysis based on an incremental cost-effectiveness ratio.

Indicates how much was paid for each additional life saved (at 4 years) by use of community thrombolysis.

10.2. Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential differences in study methodology?

No, results not compared with those of others who have investigated the same question, if indeed anyone has. This would require an individual to identify and check other studies.

10.3. Did the study discuss the generalizability of the results to other settings and patient/client groups?

This issue was not explored.

10.4. Did the study allude to, or take account of, other important factors in the choice or decision under consideration (e.g., distribution of costs and consequences, or relevant ethical issues)?

If community thrombolysis is adopted, within a fixed budget, less people will be treated (because it is more expensive), but those who are treated will be better off (in terms of survival). If the aim is to address technical efficiency, x no of people will not receive thrombolysis (either in hospital or in the community) and their 'fate' will be unknown.

Therefore the results of the study are not sufficient to address technical efficiency.

This raises issues of equity.

10.5. Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' program given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programs?

Yes, the study discussed some issues of implementation mainly transfer of workload from secondary to primary care and the potential need for incentives (financial or non-financial) for GPs to take on this work.

More generally, it states the need for extra resources in order to implement such a service. Given that the study is from the health care payer perspective, the relevant decision is whether the extra resources required could be released from other programs without losing benefits that are greater than those provided by community thrombolysis.

◄ Previous Next ►

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

About these Modules

- Home
- Introduction and Purpose
- Index

The Modules

Modules Available for Study:

- Module 1, Part 1: **Scope of Health Economics**
  Module 1, Part 2: **Key Information Sources**
- Module 2: **Sources and Characteristics of Information**
- Module 3: **Identification and Retrieval of Published Health Economic Evaluations**
- Module 4 : **Principles of Critical Appraisal of Health Economic Evaluations**

Related Content:

Health Economics Information Resources: A Self-Study Course

Module 4: An Introduction to the Principles of Critical Appraisal of Health Economic Evaluation Studies

Sample critical appraisal exercise: An economic evaluation of thrombolysis in the community: Summing Up

The study **does not fully answer questions of either technical or allocative efficiency.** However it does **provide some information** which may be employed towards **making a decision**.

The study **does not address the technical efficiency question** because there is **no defined budget** – no indication of how wide the budget could be; e.g., treatment of AMI, or just thrombolysis, or cardiac care.

Even if a budget were defined, the study is still not sufficient to address technical efficiency.

Quiz

Prepare yourself to take the quiz for this module by reviewing possible questions. Then take the quiz. When you successfully complete the quiz you can apply for the Certificate of Success for this module.

Module 4 Quiz 4 [review questions]

Previous Next

"Test Yourself" Review Question

Ex. 1 **There are three basic types of economic evaluation methodology: (1) cost-effectiveness analysis (CEA); (2) _____; and (3) cost-benefit analysis (CBA) . What is the missing type? Select the correct answer from from the list below.**

A. insurance benefits analysis B. technical efficiency analyses C. clinical efficiency analysis D. allocative efficiency analysis E. cost-utility analysis (CUA)

Ex. 2 **Are either or both of the following statements correct or incorrect? (Select the best answer). A. As a general rule cost effectiveness analysis and cost utility analysis require only health care costs to be collected. B. Cost benefit analysis requires all costs and benefits to be collected, no matter on whom they fall.**

A. Statement A: yes (A is incorrect) B. Statement A: no (A is correct) C. Statement B: no (B is correct) D. Statement B: yes (B is incorrect) E. Both statement A and statement B are correct F. Both statement A and statement B are incorrect

Ex. 3 **Double-counting - counting the same cost twice - is a potential hazard in economic evaluation. True | False?**

Ex. 4 **The market value of a resource may not be an adequate reflection of opportunity cost. An example is voluntary care - the market price is zero but there is an opportunity cost in terms of the alternative ways in which the carer could have utilized the time. A value would have to be imputed, perhaps based on the salary of a paid caregiver. This concept is called _____?**

A. cost efficiency B. un-thinking acceptance of market values C. opportunity cost D. market price

Ex. 5 **It is difficult to assign monetary values to health care benefits. Instead, _____ allows measurement of potential benefits of health care other than just health gain. (Select the best option below to fill in the blank).**

A. QALYs B. life years gained C. willingness to pay D. money E. HYEs

"Test Yourself" Review Question

Ex. 6 **Any economic evaluation where costs and benefits occur over a number of years should consider _____. (Fill in the blank with one of items from the list below).**

A. discounting B. hypothesizing C. alternatives D. surgery

About these Modules

- Home
- Introduction and Purpose
- Index

The Modules

Modules Available for Study:

- Module 1, Part 1: **Scope of Health Economics** Module 1, Part 2: **Key Information Sources**
- Module 2: **Sources and Characteristics of Information**
- Module 3: **Identification and Retrieval of Published Health Economic Evaluations**
- Module 4 : **Principles of Critical Appraisal of Health Economic Evaluations**

Related Content:

Health Economics Information Resources: A Self-Study Course

Module 3: Identification and Retrieval of Published Health Economic Evaluation Studies

Review Questions for Module 3 Quiz

This page provides review questions that will help you prepare for the Module 3 Quiz that tests your knowledge of the content you have just been studying. A link to the **interactive quiz** is provided here and also at the end of the review.

Quiz 3 **(Module 3)**

The aim of economic evaluation is to ensure that the benefits from health care programs implemented are greater than the opportunity cost of such programs by addressing questions of _____ or _____. Select the correct answer from the list below.

A. Interpretive efficiency or Inclusive efficiency
B. Economic efficiency or Evaluative efficiency
C. Allocative efficiency or Technical efficiency
D. Informational efficiency or Requirements efficiency

- Glossary of Terms
- Key General Economics Concepts
- Bibliography
- Web Sites
- Quizzes/Review
- Evaluation
- Contact Us

Explanation

The aim of economic evaluation is to ensure that the benefits from health care programs implemented are greater than the opportunity cost of such programs by addressing questions of **Allocative efficiency** or **Technical efficiency**

Allocative efficiency assesses competing programs and judges the extent to which they meet objectives.

Technical efficiency assesses the best way of achieving a given objective.

Which of these statements about a **FULL economic evaluation** does not belong with the others?

A. FULL health economic evaluations are easily identified because they consider costs.
B. A FULL economic evaluation is the ONLY type of economic analysis that provides valid information on efficiency.
C. A FULL economic evaluation requires the identification, measurement and valuation of BOTH costs and consequences.
D. A FULL economic evaluation compares BOTH the costs and consequences (effectiveness; benefits) of TWO or more interventions.

Explanation

A FULL economic evaluation **compares** BOTH the **costs** AND **consequences** (**effectiveness**; **benefits**) of TWO or more interventions. A FULL economic evaluation requires the identification, measurement and valuation of BOTH costs and consequences. A FULL economic evaluation is the ONLY type of economic analysis that provides valid information on efficiency. Some studies consider costs but do not involve comparisons between interventions or do not relate costs to benefits; these are considered partial evaluation studies.

Partial evaluations do not provide information on efficiency. **True** | False

Explanation

It is important to remember is that **PARTIAL EVALUATIONS DO NOT PROVIDE INFORMATION ON EFFICIENCY**.

Generally speaking, there are **five types of partial evaluation studies**. These are: Cost comparison/ cost analysis, Cost of illness study, Outcome description, Cost outcome description. Which one is missing from this list?

A. Costs and cost analysis
B. Outcome analysis
C. Environmental analysis
D. Outcome description

Explanation

Generally speaking, there are five types of partial evaluation studies. These are: Cost comparison/cost analysis, Cost outcome description, Cost description, **Outcome description**, and Cost of illness study.

Some economic studies which claim to be full economic evaluations may in fact only be **partial evaluations**. A study by Zarnke et al* found that, of a set of economic studies labeled as cost-benefit analyses: ___ % did not use defined CBA methodology and ___% were found to be only cost comparisons, i.e., partial evaluations.

A. 90% and 45%
B. 68% and 53%
C. 20% and 80%
D. 50% and 50%

Explanation

Some economic studies which claim to be full economic evaluations may in fact only be **partial evaluations**. A study by Zarnke et al* found that, of a set of economic studies labelled as cost-benefit analyses: **68%** did not use defined CBA methodology and **53%** were found to be only cost comparisons, i.e., partial evaluations.

No important consequences will occur as a result of mislabeling partial evaluations as full economic evaluations. True | **False**?

Explanation

This statement is false. Important consequences may occur as a result of mislabeling. Mislabeling of partial evaluations as full economic evaluations has the potential to misinform the health care decision-making process.

Important consequences may occur as a result of mislabeling. Mislabeling of partial evaluations as full economic evaluations can also result in the incorrect application of indexing terms to studies that are indexed for bibliographic databases - thus making it more challenging in identifying studies which are true economic evaluations.
True | False?

Explanation

The answer is true as stated.

The variability in the quality of published health economic evaluation studies is not well documented.
True | **False**

Explanation

The variability in the quality of published health economic evaluation studies is well documented in Jefferson, et al 2002a and Jefferson, et al 2002b.

This variability in the quality of published health economic evaluation studies has _____ implications for the identification and subsequent utilization of information on _____ in the health care decision-making process.

A. insignificant | economics
B. significant | systematic reviews
C. no significant | retrieval
D. significant | efficiency

Explanation

This variability has **significant** implications for the identification and subsequent utilization of information on **efficiency** in the health care decision-making process.

What are some of the issues regarding the quality of health economic evaluation studies? We find **three** major deficiencies, **poor methodological design**, **inadequate reporting** and **publication bias**.

Poor methodological design includes such concerns as _____, failure to define clearly the economic evaluation method used, or use of an inappropriate method if the economic evaluation is to address the research question, and omission of sensitivity analysis to test robustness of modeling.

A. a lack of data
B. using metaanalysis inappropriately
C. poor quality data sources
D. using inappropriate statistical methods

Explanation

Poor methodological design includes such concerns as **poor quality data sources**, failure to define clearly the economic evaluation method used, or use of an inappropriate method if the economic evaluation is to address the research question, and omission of sensitivity analysis to test robustness of modeling.

Inadequate reporting is generally a **lack of transparency** regarding methodology and a **lack of stringency** of journal editorial policy with regard to economic submissions.

Publication bias results from **bias** in the **effectiveness literature** or from the motivation for conducting an economic evaluation.

Guidelines for conduct of an economic evaluation have been developed as a means of addressing the problem of quality variability in health economic evaluation studies. Guidelines may be categorized as those which address the conduct, reporting, or appraisal of economic evaluation studies. **True** | False?

Explanation

This statement is **true**; that is, guidelines have been developed as a means of **addressing** the problem of **quality variability** in health economic evaluation studies. Guidelines may be categorized as those which **address the conduct**, **reporting**, or **appraisal** of economic evaluation studies.

The editorial process employed by medical journals with regard to economic submissions of economic evaluations is usually more rigorous compared to that process employed for biomedical papers. True | **False**?

Explanation

The editorial process employed by medical journals with regard to economic submissions **can be less rigorous** compared to that process employed for biomedical papers.

There is evidence that economic evaluations published in general clinical journals and in journals that published more of these analyses are of higher quality. Neumann, et al, 2000.

The following are a partial list of keywords. Which terms are correct MeSH terms used in retrieving economic evaluation studies?

A. Cost-benefit analysis
B. A and C
C. Expansion costs
D. A and E
E. Costs and cost analysis

Explanation

A and E are correct. Cost-benefit analysis and Costs and cost analysis are both MeSH terms used in retrieving economic evaluation studies.

The MeSH term ‘cost-benefit analysis’ is used to index ALL types of economic evaluation studies, not just cost-benefit studies. **True** | False?

Explanation

This statement is true. The MeSH term ‘cost-benefit analysis’ is used to index ALL types economic evaluation studies, not just cost-benefit studies.

EMTREE does not provide an individual indexing term for each type of economic evaluation methodology. True | **False**?

Explanation

The answer to this question is true. There is a clear distinction within EMTREE between the different types of economic evaluation methodologies.

EMTREE provides an individual indexing term for each type of economic evaluation methodology. In addition, EMTREE provides an additional indexing term - '**economic evaluation**' (explodes).

The terms ' **cost control**' and '**cost of illness**' appear as narrower terms under 'economic evaluation'. This use of these two terms is not strictly correct as these are **partial evaluation** study types.

Ready to take the Quiz for module 3? When you successfully complete the quiz you can apply for the Certificate of Success for this module.

Previous Quiz Next

Last reviewed: 13 June 2006
Last updated: 13 June 2006
First published: 05 December 2003
Metadata| **Permanence level:** Permanent: Dynamic Content

Quiz for Health Economics Module 3

Module 3 was intended to demonstrate an effective approach to systematic searching of published health economic evaluation studies. Upon successful completion of this quiz you may request a **Certificate of Success** by clicking on the **button** located at the **bottom of the answer page**.

1. The variability in the quality of published health economic evaluation studies is not well documented. True | False

○ True ○ False

2. The aim of economic evaluation is to ensure that the benefits from health care programs implemented are greater than the opportunity cost of such programs by addressing questions of _____ or _____. Select the correct answer from the list below.

○ A. Interpretive efficiency or Inclusive efficiency ○ B. Economic efficiency or Evaluative efficiency ○ C. Allocative efficiency or Technical efficiency ○ D. Informational efficiency or Requirements efficiency

3. The MeSH term 'cost-benefit analysis' is used to index ALL types of economic evaluation studies, not just cost-benefit studies. True | False?

○ True ○ False

4. Partial evaluations do not provide information on efficiency. True | False

○ True ○ False

5. Important consequences may occur as a result of mislabeling.

Mislabeling of partial evaluations as full economic evaluations can also result in the incorrect allocation of indexing terms at the point of inclusion into a bibliographic database and mislabeling will cause difficulties in identifying studies which are true economic evaluations. True | False?

○ True ○ False

6. Which of these statements about a FULL economic evaluation does not belong with the others?

○ A. FULL health economic evaluations are easily identified because they consider costs. ○ B. A FULL economic evaluation is the ONLY type of economic analysis that provides valid information on efficiency. ○ C. A FULL economic evaluation requires the identification, measurement and valuation of BOTH costs and consequences. ○ D. A FULL economic evaluation compares BOTH the costs and consequences (effectiveness; benefits) of TWO or more interventions.

7. EMTREE does not provide an individual indexing term for each type of economic evaluation methodology. True | False?

○ True ○ False

8. Guidelines for conduct of an economic evaluation have been developed as a means of addressing the problem of quality variability in health economic evaluation studies. Guidelines may be categorized as those which address the conduct, reporting, or appraisal of economic evaluation studies. True | False?

○ True ○ False

9. This variability in the quality of published health economic evaluation studies has _____ implications for the identification and subsequent utilization of information on _____ in the health care decision-making process.

○ A. insignificant | economics ○ B. significant | systematic reviews ○ C. no significant | retrieval ○ D. significant | efficiency

10. The following are a list of keywords. Which terms are correct MeSH terms used in retrieving economic evaluation studies?

○ A. Cost-benefit analysis ○ B. A and C ○ C. Expansion costs ○ D. A and E
○ E. Costs and cost analysis

Submit your answers Back

Last updated: 21 May 2004
First published: 05 December 2003
Permanence level: Permanent: Dynamic Content