Critical Appraisal Worksheet for Economic Analysis

The following questions will help focus your attention on the important methodological issues related to articles on economic analysis. They are divided into three sections: validity, results, applicability.

Note three types of economic analyses:

a. **Cost-effectiveness analysis (CEA)** is the most common, and is used to compare cost differences between 2 clinical strategies. It often reports cost per quality-adjusted life-year (QALY).

b. **Cost-benefit analysis (CBA)** is used to measure the full economic costs and benefits of various strategies, where benefits are measured economically (based on money related to employment etc).

c. **Cost-utility analysis (CUA)** is a type of CEA which includes patient preferences in the analysis. The terms CUA and CEA are often used interchangeably.

**VALIDITY:**

1. What was the structure of the *model* on which the analysis was based? Did the model provide a reasonable comparison of health care strategies?

   An economic analysis is fundamentally based on a decision model, which maps out the possible downstream effects of a clinical decision.

   Consider the following issues:
   
   - The timeline utilized and whether it is reasonable (e.g. 1 year, lifetime)
   - The clinical relevance and appropriateness of the strategies
   - Look for a decision tree, on which the analysis is based
   - Whose viewpoint was used (patient, insurer, government, society)?

   Yes □  Cannot tell □  No □

   What were the major strategies compared in the analysis? Are there other important health care strategies that were not included? If so what were they?

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Is there a decision tree or is it described? If so, does it reasonably reflect the potential outcomes of each treatment strategy?

Whose viewpoint was used when considering costs? (Patient, Insurers, Government, etc)

What is the timeline? (often lifetime)

2. **Were the outcomes (probabilities) properly measured?**

*The investigators need to accurately estimate the likelihood of each outcome in their model. These “probabilities” should be as evidence-based as possible.*

Consider if the analysis did the following:

a. Look at the quality of the data the authors use to estimate effectiveness.

Yes ☐  Cannot tell ☐  No ☐

What type of data was used to establish efficacy (RCTs, Systematic Reviews, other)? Does this data seem reasonable?

3. **Were utilities properly measured?**

*Investigators need to accurately estimate “utilities“, which assign values to various health states, where 1=perfect health and 0=death. A year of life with a chronic illness (e.g. s/p stroke) will be given a value <1. There are studies which estimate utilities for common health states.*

Was data used to establish utilities? Do these utilities seem reasonable?
4. Were costs properly measured?

*Investigators need to accurately estimate the cost of each strategy, through estimates of the cost of each possible outcome.*

What type of data was used to establish costs? Does the data seem reasonable?

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5. Was appropriate allowance made for uncertainties in the analysis?

Consider the following issues:

- Was sensitivity analysis performed? This is the major method for addressing uncertainties. In sensitivity analysis the authors will re-analyze the data after changing values for different variables, to see if these changes impact the overall result. This is particularly important for variables for which estimates are based on poor quality data, or for variables which might differ among settings or which might be impacted by other interventions.
- Look for sensitivity analysis based on disease prevalence as well as differences in efficacy estimates.

Yes □  Cannot tell □  No □

Did the sensitivity analysis include all possible uncertainties?

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RESULTS

1. What were the incremental costs and outcomes of each strategy?

- This is the main result. Look for an overall result and how it is expressed (usually cost per QALY in a CEA)
- Look for whether the model was robust in the sensitivity analysis. This indicates that variations in important variables did NOT substantially change the overall result.
- Threshold values are values of variables which change the result of the model (usually meaning that the intervention crosses the line of "cost-effectiveness")
- Did the overall result (the cost estimates) change substantially in the sensitivity analysis? Under which conditions did the estimates change?
What was the overall result? Describe how uncertainty changes the incremental costs and outcomes of each strategy?

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APPLICABILITY

1. Are the treatment benefits worth the harms and costs?

Consider the following issues:
   - What was the magnitude of the benefit or harm?
   - Are cost estimates in the study similar to local costs?

Yes □   Cannot tell □   No □

2. Can the results be applied to my patients?

Consider if the study population and the study sites are similar to yours in terms of:
   - Patients
   - How diseases are clinically managed
   - Prices/costs
   - Utilities- do they reflect the values of our population?
   - How patients use the healthcare resources
   - Accessibility of resources

Yes □   Cannot tell □   No □

Will this analysis change your practice? Why or why not?

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