CADTH Health Economics Guidelines: What’s New?

2017 CADTH SYMPOSIUM PANEL PRESENTATION
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Overview of the Update

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Key Changes

• Focus on the Decision Problem
• Introduction of a Reference Case
• Highlight the importance of uncertainty
• Emphasis on transparency in methods and reporting
CONTEXT
Canadian Context

• Approach to collective health care decisions
  o Maximize social welfare vs. an explicit policy objective

• Role of economic evaluations
  o Prescribing social choice vs. informing social decisions

• Decision-maker’s budget
  o Unconstrained vs. constrained
Publicly Funded Health Care System

Citizens

Government (socially legitimate higher authority)

Resources  Policy Objective

Decision Maker (publicly funded health care payer/provincial/territorial Ministry of Health)

Maximize degree to which explicit policy objective is achieved

Economic evaluation designed to inform decision maker
Theoretical Foundation

• Social decision-making viewpoint
  o The health care decision-maker, acting on behalf of a socially legitimate higher authority, seeks to maximize the degree to which an explicit policy objective (e.g., improving the overall health of the population) is achieved subject to the available resources

• Constrained budget
  o Assumes that the additional cost of a new investment falls upon the decision-maker’s budget, thus other health care interventions will be forgone or displaced
Technical Efficiency

• The recommendations contained in these Guidelines are focused on achieving technical efficiency within a constrained budget.

• Technical efficiency refers to obtaining the maximum possible improvement in an outcome from a given set of resource inputs.

• The changes to the Guidelines were undertaken on the basis of defining a set of methods for the economic evaluation of health care technologies that will serve to inform the efficient allocation of scarce health care resources.
TOPICS
Decision Problem

- Previously referred to as *Study Question*
- Ensures the role of economic evaluation to support decisions
- A discrete decision problem specified for each perspective and subgroup of interest
Decision Problem

• Comprehensive specification of interventions to be compared, setting(s), perspective, time horizon, and target population(s)

• Specify the decision problem in consultation with clinicians, members of the target population, and the decision-maker(s)

• Ensure that most relevant outcomes for each stakeholder taken into account; and assessment founded on a thorough understanding of all available evidence
Comparators

- The choice of comparator(s) should be related to the scope of the Decision Problem, reflecting target population(s) of interest and jurisdiction for which the decision is being made
- All currently used and potentially displaced interventions should be considered
- Comprehensive approach to selecting comparators
Perspective

• Related to the Decision Problem
• In the Reference Case, this would be the publicly funded health care system
• Both costs and outcomes should be consistent with stated perspective
• Where perspectives are of interest and could have substantial impact on results, these should be included as non-reference case analyses
• Clarity provided regarding what might be included for different perspectives
## Examples of different costs and outcomes by perspective

<table>
<thead>
<tr>
<th>Types of Costs</th>
<th>Reference Case</th>
<th>Non-Reference Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Care Payer</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Broader Government Payer</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Societal</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

| Costs to publicly funded health care payer          | ✓              | ✓                  |
| Costs to government payer (beyond health care)      |                | ✓                  |
| Costs to patients and informal caregivers           |                | ✓                  |
| Productivity costs                                 |                | ✓                  |

<table>
<thead>
<tr>
<th>Types of Outcomes</th>
<th>Reference Case</th>
<th>Non-Reference Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health effects relevant to patients and informal caregivers</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Non-health effects relevant to patients and informal caregivers</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Time Horizon

• Time horizon should be:
  o Long enough to capture all relevant differences in future costs and outcomes associated with the interventions
  o Related to the Decision Problem
Types of Evaluations

• Cost utility analysis as the recommended form of analysis
  o Promotes comparability
  o Allows for full assessment of uncertainty
• Other forms of analysis not appropriate for the reference case
Types of Evaluations

- A cost-effectiveness analysis (CEA) with outcomes expressed in natural units is not an appropriate reference case analysis.
- A cost-minimization analysis (CMA) is a costing exercise and not a formal economic evaluation. As such, a CMA is not an appropriate reference case analysis.
- A cost-consequence analysis (CCA) should be viewed as a complement to, and not a substitute for, a CUA.
- If outcomes can be valued in monetary terms then, additionally, a cost-benefit analysis (CBA) can be undertaken as a non-reference case analysis, with full details provided on the derivation of monetary values for all outcomes.
Target Population

• Target population(s) should be specified and consistent with the Decision Problem
• Describes the population for which the intervention is to be used
  o Patients, informal caregivers, population at large
Target Population

• Where factors are identified that may affect natural history, effectiveness of interventions, utilities or costs subgroups should be specified for the analysis

• Stratified analysis with results presented for each subgroup should be provided in the reference case

• When a decision-maker cannot implement decisions by subgroups, the ICER should be determined by weighting the estimates for each subgroup by their respective prevalence

• Any potential spillover impacts beyond the target population(s) should be addressed in a non-reference case analysis
Target Population

• Allows for full understanding of the cost effectiveness of interventions in relevant subgroups
• Promotes objective of maximizing population health
Modelling

- The model should be consistent with current understanding of clinical and/or care pathway for the health condition and interventions being compared.
- Researchers should consider any existing well-constructed and validated models to help inform exercise.
- Modelling technique should be no more complex than is necessary to address the Decision Problem.
- Models should be subjected to validation.
- The model must be designed to meet other Guideline statements.
Effectiveness

- Increased level of detail for this topic
- Clear criteria for assessment of effectiveness information:
  - Credibility – perceived lack of bias
  - Consistency – uniformity across parameters
  - Fitness for purpose – relevance to the decision problem
- Additional details on:
  - Methods for extrapolation
  - Use of information from NMAs, administrative data
Effectiveness

- A comprehensive and transparent search for data on clinical effectiveness and harms should be conducted.
- Data from all available sources should be synthesized using methods that take account of potential differences in the fitness for purpose, credibility, and consistency.
- Researchers should evaluate and justify the validity of any surrogate end points, including biomarkers, used for parameter estimation.
Effectiveness

• Time-to-event (also referred to as survival) analysis using parametric models can be used to extrapolate from shorter-term parameter estimates to longer-term effects
  o Appropriate guidance on practice provided
• Focus on the validity of extrapolation methods and the need for clinical justification of approach
  o Provide proportion of estimated benefit accumulated within the time horizon of clinical evidence
  o Provide proportion of estimated benefit accumulated whilst on treatment
Measurement & Valuation of Health

- Previously referred to as *Valuing Outcomes*
- In the reference case, the QALY should be used as the method for capturing the value of the effect of an intervention
- Health preferences should reflect the general Canadian population
- In the reference case, researchers should use health preferences obtained from an indirect method of measurement that is based on a generic classification system
Measurement & Valuation of Health

- Clarify guidance on:
  - combining health utilities
  - valuing non-health effects
Resource Use & Costs

• Reflects updated CADTH *Guidance Document for Costing*

• The reference case should include all relevant resources based on the perspective of the publicly funded health care payer

• When a range of perspectives is relevant to the decision problem, classify resources and their associated costs according to the reference case perspective and any additional non-reference case perspectives
Resource Use & Costs

- Resource use and costs should be based on Canadian sources and reflect the jurisdiction(s) of interest (as specified in the decision problem).
- When valuing resources, researchers should select data sources that most closely reflect the opportunity cost, given the perspective of the analysis.
- Additional guidance on:
  - Use of administrative data
  - Inclusion of patient and informal caregiver time
Discounting

• Costs and outcomes that occur beyond one year require the application of a discount rate that reflects society’s preferences over time

• Adopted a theoretical basis for the choice of discount rate
  • Commissioned a technical report on the foundations and derivation of a discount rate for Canada

• Based on principles that underpin the Guidelines
Discounting

- Economic **efficiency** requires that the social discount rate measure the marginal social opportunity cost of resources allocated to government investment
  - Approximated by real rate of interest on government bonds

- **Social decision-making viewpoint** → real rate of interest on government bonds faced by the higher authority that funds the health care system
  - The recommended discount rate for the reference case is based on provincial bond rates
Discounting

<table>
<thead>
<tr>
<th>Costs</th>
<th>the real rate of interest on provincial government bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes</td>
<td>the real rate of interest on provincial bonds minus the growth rate of the cost-effectiveness threshold</td>
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Given the uncertainty in the value of the cost-effectiveness threshold and how it is anticipated to change over time, it is recommended that costs and outcomes are discounted at the same rate.

Recommended discount rate for the reference case is set at 1.5% per year for both costs and outcomes.
Discounting

• The potential impact of applying non-constant discount rates (i.e., rates that vary according to when the costs and outcomes are accrued) may be investigated in a non-reference case analysis.

• To incorporate potential uncertainty and to assess the sensitivity of the results to changes in the discount rate, a non-reference case analysis using a rate of 0% is recommended to show the impact of discounting.
  
  o 3% (double the current reference case rate) is recommended as an upper bound.
Analysis

• New section
• Highlights importance of conducting all analyses probabilistically
• Details how data obtained to populate the model should analysed in terms of expected values for costs ands outcomes, and an incremental cost effectiveness ratio
• Describes how results should be reported
Analysis

• In the reference case, the expected values of costs and outcomes for each intervention should be estimated.

• The economic evaluation should be assessed based on the incremental cost-effectiveness ratio (ICER).

• Estimates of net monetary benefit may also be provided.

• For analyses with more than two interventions, a sequential analysis of cost-effectiveness should be conducted following standard rules for estimating ICERs, including the exclusion of dominated interventions.
Uncertainty

- Clear description of 3 categories of uncertainty
  - Parameter – addressed using probabilistic analyses
  - Methodological – reference compared to a non-reference case
  - Structural – addressed using scenario analyses
- Deterministic analyses of parameter uncertainty no longer recommended
- Variability now addressed through consideration of heterogeneity within Target Populations
Uncertainty

- The impact of uncertainty on estimated costs and outcomes for each intervention should be presented using cost-effectiveness acceptability curves (CEACs) and cost-effectiveness acceptability frontiers (CEAFs)

- When the decision problem includes the option of commissioning or conducting future research, value-of-information analysis may be helpful to characterize the value of these options and design future research and should be included in the reference case analysis
Uncertainty

• The expected value of perfect parameter information should be provided for all parameters identified as being critical to the decision

• The population expected value of perfect parameter information should also be provided, reflecting both the likely size of the population and the lifetime of the intervention

• Value-of-sample information and net-benefit of-sampling analyses will support decision-makers’ assessments of the return on investment of further research
Equity

- To ensure the societal objective relating to population health, all outcomes should be weighted equally regardless of the characteristics of those receiving the health effect.

- Analyses should be presented in disaggregate format with descriptions of relevant patient populations to allow for consideration of any alternative societal objectives.

- Researchers should approach any equity concerns by acknowledging the potential implications of both horizontal equity (equal treatment of equals) and vertical equity (unequal treatment of unequals).
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