Reference Case Guidelines for Benefit-Cost Analysis

General Framework

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Washington D.C.
October 22, 2019
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Concepts and Application
What is benefit-cost analysis?

• One of several tools for assessing policy impacts.
  – Well-established and widely-used.
• Measures improvements and harms using the same metric (money).
  – Facilitates comparison of dissimilar impacts.

*a.k.a. cost-benefit analysis, return on investment analysis.*
What is benefit-cost analysis?

• Term is often used to describe any process for weighing benefits and harms.

• Technical definition is more precise.
  – Rooted in welfare economics.
  – Reflects an explicit normative framework.

• Focuses on trade-offs associated with the allocation of limited resources.
  – If we use resources for one purpose, they will not be available for other uses.

➢ “Opportunity costs.”
How is value estimated?

• Value is based on how much money an affected individual is willing to pay or accept for the outcome.
  – Generally assume individuals are the best (most legitimate) judge of their own welfare (“consumer sovereignty”);
  – Respects individual preferences, not paternalistic.

• Describes extent to which individuals are willing, as members of a society, to reduce their consumption of other goods and services to achieve particular policy outcomes.
How is value estimated?

• Rely on market data where possible for valuation.
  – Presumably, if an individual chooses to buy a good or service, he or she values it more than the other things the money could buy.

• For nonmarketed goods, use stated or revealed preference methods.
  – Stated preferences – ask respondents what they would be willing to pay under hypothetical scenarios (contingent valuation, choice experiments).
  – Revealed preferences – use data on market transactions or observed behavior to estimate value, controlling statistically for other attributes.
How is value estimated?

• Money is not important *per se*;
  – represents the use of resources (labor, materials, etc.),
  – and the consequences of alternative allocations.

• Allows comparison of disparate impacts using a common metric, including health and non-health benefits such as environmental improvements as well as costs.

• Could use another measure; money is simply a convenient and well-established measure of exchange.
When is benefit-cost analysis useful?

- One of several approaches for economic evaluation.
- Preferred approach depends on the context.
  - What choice is the analysis intended to inform?
  - What questions are likely to be raised by decision-makers, other stakeholders?
- Often useful to conduct more than one type of analysis.
  - Each has a different focus; advantages and limitations.
When is benefit-cost analysis useful?

- **Benefit-cost analysis** may be particularly useful when the goal is to allocate limited resources:
  - Across policies implemented within and outside of the health care system.
  - Across policies with both health and nonhealth consequences.
- Many policies implemented outside the health care system have significant health impacts.
  - Including those addressing, for example, environment, education, transportation, nutrition.
When is benefit-cost analysis useful?

• **Cost-effectiveness analysis** may be particularly useful when the goal is to allocate limited resources so as to maximize health.
  – For example, single-payer health plans, universal health coverage.

• Also useful in informing decisions regarding the appropriate medical care for a particular condition.

• Typically uses metrics such as quality-adjusted life years (QALYs) or disability-adjusted life years (DALYs) to integrate consideration of health and longevity.
  – Consistent with notion that health-improving interventions should be provided regardless of the affected individual’s preferences for allocating resources.
Why is it useful?

• Economic evaluation encourages thorough examination of impacts; supports evidence-based decisions.

• Often unearths information needed for policy development and implementation, such as:
  – Preferences of those affected;
  – Otherwise unanticipated consequences;
  – Available technology, costs, effectiveness;
  – Who bears costs, who receives benefits;
  – Sources of support, opposition.
Applications

• Widely-used to assess policies implemented outside the health care system that profoundly affect health:
  – Regulations
  – Social programs
  – Priority setting
Applications

• Increasingly used to assess investments in health.
Key Questions

• Given uncertainty,
  – For an individual policy, how likely is it that the benefits will exceed the costs?
  – For a group of policies, how likely is it that the relative ranking will change?
  – What is the likely magnitude of the net benefits?
• In some cases, conclusions may not be significantly affected by uncertainty; in others it will be important.
• A policy should not necessarily be implemented simply because its benefits exceed its costs, its benefit-cost ratio exceeds 1.0, or its internal rate of return is favorable.
  – Comparison to other policies is necessary to identify the most efficient use of resources.
  – Decision-makers also need to consider issues such as legal, political, and budgetary constraints as well as any distributional concerns.
Components and Steps
Major Components

1) Define the problem

2) Identify policy options

3) Determine standing (perspective)

4) Predict baseline conditions (comparator)

5) Predict policy responses

6a) Estimate costs

6b) Estimate benefits

7) Compare benefits to costs

8) Estimate the distribution

Assess uncertainty and nonquantified effects
Implementation Steps

1. Develop comprehensive list of potential impacts.
2. Use screening analysis to estimate possible magnitude and focus future work.
3. Conduct detailed analysis of important impacts to reduce uncertainty.
4. Report the results, including non-quantified effects and uncertainties in quantitative estimates.
Summary Measures

1) Define the problem

2) Identify policy options

3) Determine standing (perspective)

4) Predict baseline conditions (comparator)

5) Predict policy responses

6a) Estimate costs

6b) Estimate benefits

7) Compare benefits to costs

8) Estimate the distribution

Assess uncertainty and nonquantified effects

- **Net benefits** (benefits minus costs)
- **Benefit-cost ratio** (benefits divided by costs)
- **Internal rate of return** (discount rate at which net benefits are zero)
Summary measures

- Consistent categorization of benefits and costs is needed for total benefits, total costs, and benefit-cost ratios to be comparable across analyses.

  Costs = policy inputs = net value of labor, materials, and capital used to implement and operate the policy.

  Benefits = policy outputs = net value of changes in health and longevity and other outcomes attributable to the policy.

- Net benefits are often used when selecting among options for addressing a particular problem.
- Benefit-cost ratios or IRRs are often used in prioritizing spending across diverse policies.
Summary measures

• If the benefit-cost ratio or IRR is the highlighted summary measure,
  – Net benefits should also be reported to indicate the magnitude of the impacts.

• For example, if we compare a policy with $1,000 in benefits and $100 in costs to a policy with $1,000,000 in benefits and $100,000 in costs:
  – Both have a benefit-cost ratio of 10 to 1.
  – The latter policy leads to substantially larger improvements in welfare, but requires a much greater investment.

• Similarly, if the costs of these policies occur in the current year and the benefits occur 10 years later:
  – They have the same IRR (29 percent) but the second policy has the larger present value if the discount rate is smaller than this rate.
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