



SCIENCE



CONNECTIONS



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# Part I: Introduction to Economic Evaluation

The First of a Five-Part Series



Heart Disease  
& Stroke Prevention

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Welcome to this five-part web presentation series on Economic Evaluation Methods.

Here are some questions to think about:

- How do you really know you're making the most of your limited resources?
- How do you decide between two promising program options when you can only afford one?
- How do you demonstrate to decision-makers that the benefits of your program are worth the costs?

The answer is economic evaluation—a powerful tool that can help with all these situations.

This series is designed to introduce you to a number of important concepts that will help you understand the value of economic evaluation and how to incorporate economic evaluation methods into your programs.

The four types of analysis that we will discuss in this series are:

- One: economic impact analysis
- Two: programmatic cost analysis
- Three: benefit-cost analysis, and
- Four: cost-effectiveness analysis.

We will also discuss cost-utility analysis, a special type of cost-effectiveness analysis.

In Part One, we'll define these terms and explain how economic evaluation can help you. The modules that follow will walk you through the process you would use to develop and conduct each of these types of analyses.

# Why Care About Economics Within the Context of Public Health?

- We want to **maximize outcomes** and **minimize costs**.
- Limited resources = hard decisions.
- **Return-on-investment (ROI)** shows how much value we get from our spending decisions.

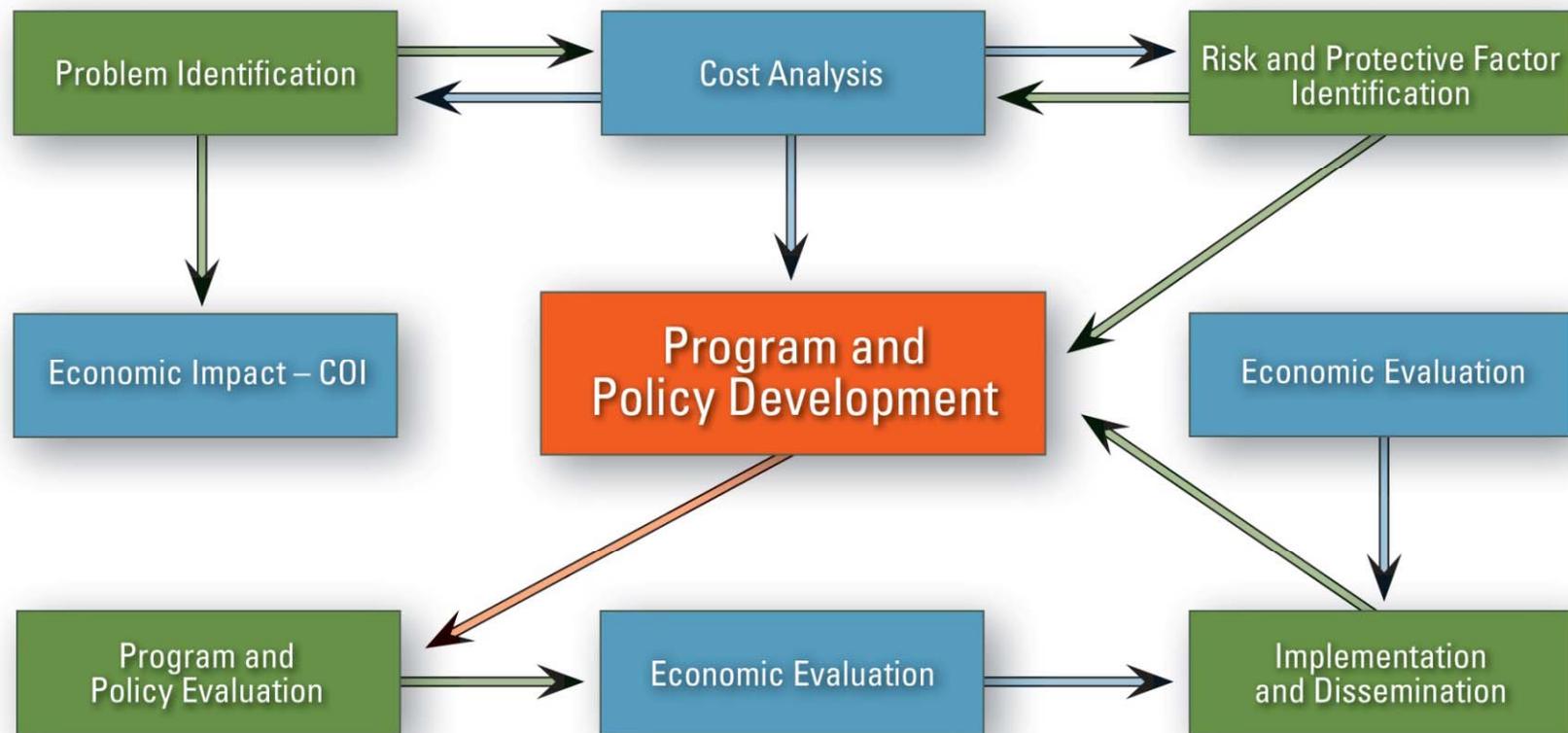


As public health practitioners, we care about improving the health of the entire population, so we try to maximize health outcomes. But why should we care about economic issues in public health?

Both public health managers and economists would agree that maximizing health outcomes is an important goal. However, public health interventions, programs, and policies all have costs, and from an economist's perspective, keeping these costs low is also an important goal.

If we lived in a society with unlimited resources to use any of the interventions available, then we might not care so much about minimizing costs. But our reality is that financial resources for public health are scarce, and the situation is only getting worse. Therefore, we want to demonstrate the value we gain from the resources we use. Another way to put this is to say that we care about societal returns on our investment in public health.

# Public Health Model for Prevention



To identify problems we hope to address, we use surveillance to determine the burden of a disease. Surveillance takes into account incidence, prevalence, and mortality rate. In gauging the economic burden, surveillance provides information on the medical costs and losses in productivity associated with a disease.

We also look at the causes of a disease to determine the risk and protective factors. Information about these factors helps refine our surveillance systems and identify high-risk populations and others who might benefit from public health interventions.

Program and policy development are also important. Programmatic cost analysis is part of this process.

Evaluation of an intervention, program, or strategy's effectiveness looks at how well it reaches its intended goal of improved health outcomes. In contrast, economic evaluation helps us understand the *cost factors* related to an intervention.

Economic evaluation can be conducted prospectively or retrospectively. For example, economic evaluation can be used before recommending broad implementation of an effective program or strategy.

# Cost of Illness Analysis

- Estimates total costs of a disease or condition:
  - Medical and non-medical costs.
  - Productivity losses.
- Generally reported as:
  - Annual total cost.
  - Average patient lifetime cost.
- Shows potential benefits of prevention.



The first type of economic evaluation—economic impact analysis—deals with problem identification in the public health model. Economic impact analyses are sometimes called “cost of illness estimates,” “impact analyses,” or “economic burden estimates.” These analyses estimate the total costs incurred by a disease or illness.

Economic impact analyses typically include the costs of medical care required to treat or manage an illness. Often, these analyses also include estimates of lost productivity associated with the disease. Economic impact analyses are usually reported as annual total costs for a group, or cohort, of people with the disease, regardless of when the disease first occurred. This is a prevalence-based approach.

As an alternative, the analyses can be reported as total lifetime costs for a cohort of people who acquire the disease within a specified time period. This is an incidence-based approach.

Both of these approaches can be used to show the potential benefits of efforts to prevent the disease. Module 2 will provide more information on this topic.

# Cost Analysis

- First step of a full economic evaluation.
- Estimates total program costs and determines who incurs those costs.
- Includes both **financial** and **economic** costs.
  - *Financial costs* show up on a budget sheet.
  - *Economic costs* include in-kind services.
- Foundation for budget justification, decision-making, and forecasting.



Another type of economic evaluation is programmatic cost analysis. This is typically the first step in an economic evaluation comparing program costs to program outcomes.

Programmatic cost analyses include all the resources required to implement an intervention, including personnel, space and utilities, travel, materials, and supplies. These costs are important for determining who incurs the costs—it could be the program itself, participants in the intervention, or external community resources.

Programmatic cost analyses include financial costs that appear in a budget as well as economic costs that are in-kind services. Module Three will provide more information on this topic.

# Economic Evaluation Methods

- What is economic evaluation?
  - A way to identify, measure, value, and compare the costs and results of programs and policies.
- There are three main methods:
  - **BCA:** benefit-cost analysis.
  - **CEA:** cost-effectiveness analysis.
  - **CUA:** cost-utility analysis.



A comparison of costs and benefits is the next step in economic evaluation. In this step, we assess the costs of an intervention as well as the benefits it provides. The two main types of this assessment are benefit-cost analysis and cost-effectiveness analysis.

In benefit-cost analysis, program costs and benefits are converted into dollars. In cost-effectiveness analysis, program costs are in dollars but benefits are left in some natural unit, like life years saved. A special type of cost-effectiveness analysis—called cost-utility analysis—includes only health outcomes in the analysis.

Benefit-cost analysis will be discussed in module 4. Cost-effectiveness analysis will be discussed in module 5.

# How Economic Evaluations Inform Policy

## Tier of Decision-Making

### President/Congress

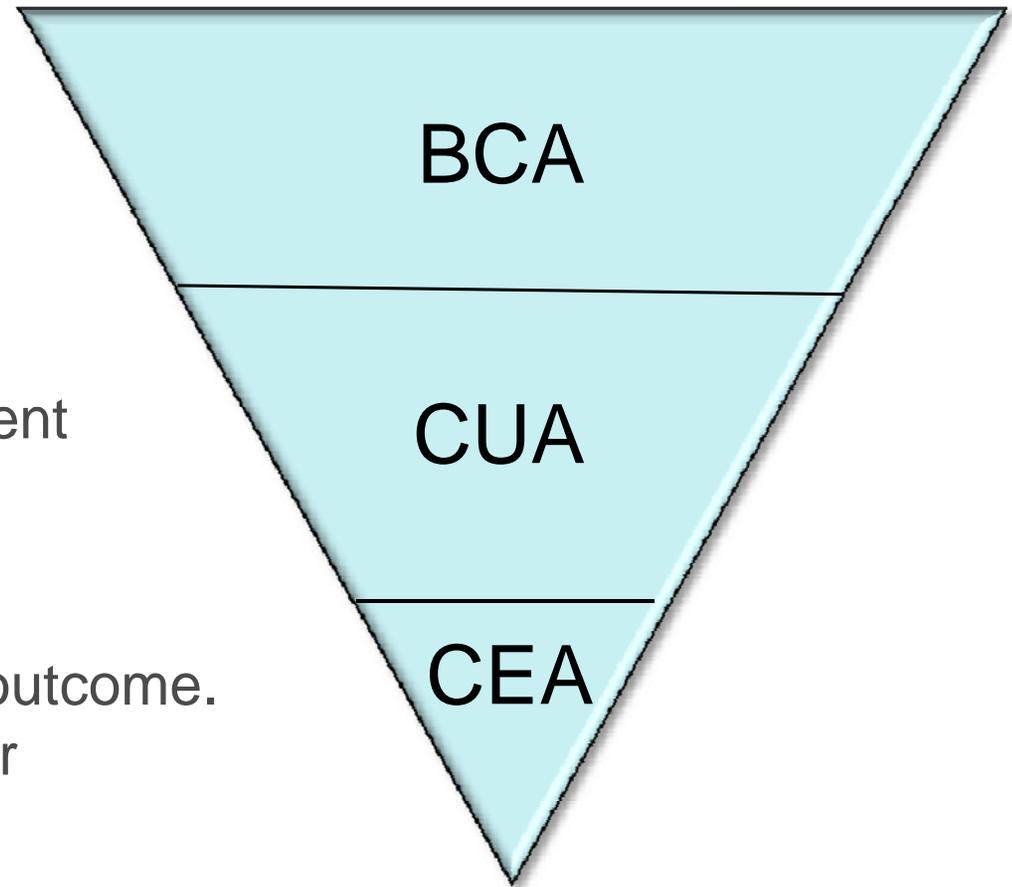
- Determine Federal budget.
- BCA converts results to dollars.

### HHS

- Allocate funds to health programs.
- CUA compares outcomes of different programs.

### Local Program

- Select best intervention for given outcome.
- CEA quantifies outcomes of similar programs.



The particular type of economic evaluation we use depends on who makes the decision about which intervention to use. For example, at the federal level, the president has to make decisions balancing defense and health. Because the outcomes are different, a benefit-cost analysis that converts outcomes into dollars is the most appropriate economic evaluation method.

By contrast, the CDC director makes decisions about interventions that affect different health programs—for example, hypertension screening versus injury prevention. The outcomes are different—hypertension versus disabilities—but both are health related. Therefore, a cost-utility analysis, which includes only benefits that affect different aspects of health, is the most appropriate economic evaluation method to use.

In another example, the director of a heart disease prevention program makes decisions about interventions that affect the same health outcome—for example, two interventions to increase hypertension screening. In this case, the most appropriate economic evaluation method is a cost-effectiveness analysis, which keeps outcomes in their natural units, like the number of cases of hypertension treated.

The remaining presentations in this series will provide more in-depth information on all of these types of economic evaluation that can be applied to the public health model for preventing disease.

# Types of Economic Evaluation Methods Used for CVD Prevention

Cost-consequence or cost-minimization	28	14%
CEA (cost per clinical outcome)	<b>53</b>	<b>27%</b>
CEA (cost per life-year)	<b>73</b>	<b>37%</b>
CUA (cost per QALY)	38	20%
BCA	3	2%

(Schwappach et al., 2007)



This table shows percentages of five types of economic evaluation in cardiovascular research, as determined by Swappach and colleagues.

# Main Themes

- Economic evaluation enhances decision-making and helps set health policy.
- Practitioners and evaluators need to be adept at these analyses because demand for them is growing.



Economic evaluation is often used to inform decisions about health policy. Increasing demand for economic evaluation requires that practitioners and evaluators have a firm grasp of the principles involved .

# Outline of Presentations

II. Economic Impact Analysis

III. Programmatic Cost Analysis

IV. Benefit-Cost Analysis

V. Cost-Effectiveness Analysis



This concludes the first presentation, Introduction to Economic Evaluation. The remaining presentations will highlight each of the four types of economic evaluation: economic impact analysis, programmatic cost analysis, benefit-cost analysis, and cost-effectiveness analysis.

# Resources

- Haddix et al. *Prevention Effectiveness: An Introduction to Decision Analysis and Economic Evaluation*. (Oxford University Press, 2003).
- *Applying Cost Analysis to Public Health Programs* (available at the Public Health Foundation Web site, [www.phf.org](http://www.phf.org)).



More information and additional resources on economic evaluation are available from the textbook *Prevention Effectiveness: A Guide to Decision Analysis and Economic Evaluation* and from a Web site on *Applying Cost Analysis to Public Health Programs*.

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