Program Evaluation Tip Sheet:
Economic Evaluation

This tip sheet is intended for programs funded through the Centers for Disease Control and Prevention's (CDC) Division for Heart Disease and Stroke Prevention. This document defines economic evaluation, offers types of economic analyses, and provides steps to complete an economic evaluation. This tip sheet is not intended as a comprehensive guide to economic evaluation.

What is Economic Evaluation?

Economic evaluation is an effort to use analytic methods to identify, measure, value, or compare the costs and consequences of one or more alternative programs or interventions.[1] Consequences could be disease cases averted, quality-adjusted life years, or cost-savings because of disease prevention.

Purposes of economic evaluation may include the following:

- To understand cost and to find ways to reduce program costs.
- To monitor, record, or evaluate program effectiveness, particularly in relation to program costs.
- To inform decision makers about alternative interventions regarding both costs and health outcomes.

What are the Different Types of Economic Evaluation?[1]

- Cost Analysis involves the systematic collection, categorization, and analysis of the net costs of a program, calculated by subtracting the cost-of-illness from the program cost. The cost-of-illness is defined as the value of the resources that are expended as a result of a health problem, and can include health sector costs, the value of lost productivity by the patient (indirect cost), and the cost of pain and suffering (intangible costs).
- Cost-Benefit Analysis is a form of economic evaluation that provides both the costs and consequences of the interventions in dollar terms.
- Cost-Utility Analysis is a form of cost-effectiveness analysis using quality-adjusted life years as a health outcome.
- Cost-Effectiveness Analysis examines costs and health outcomes of interventions.

Key Considerations to Determine Which Form of Economic Evaluation to Use: Identify Audience and Purpose[1]

Type of Economic Evaluation	Economic Summary Measure[1]	Audience and Purpose
Cost Analysis	Net cost	For those who want to minimize cost for the program. For those who want to do cost-benefit, cost-utility, or cost-effectiveness analysis.
Cost-Benefit Analysis	Net benefit or cost Cost to benefit ratio	For those who want to make a decision between health outcomes and other type of outcomes (e.g., health vs. defense).
Cost-Utility Analysis	Cost per quality-adjusted life-year	For those who want to make a decision between different types of health outcomes (e.g., stroke mortality vs. disability due to injury).
Cost-Effectiveness Analysis	Cost-effectiveness ratio Cost per case averted Cost per life-year saved	For those who want to make a decision between interventions that generate the same health outcomes or whether an intervention is effective.

Four Steps of an Economic Evaluation[1,2]

Step 1: Frame an Economic Evaluation

Define the problem, intervention options, audience and purpose, time frame, and analytic horizon.

Define	Examples of Items To Consider
Problem	What is the problem to be analyzed? What aspects of the problem need to be explained? What questions need to be answered?
Intervention Options	Describe the nature of the intervention(s), target population(s), delivery site(s), personnel, technology, and timing.
Audience and Purpose	Who will use the results of the evaluation? How will the results be used?
Time Frame and Analytic Horizon	Is the time frame long enough to account for program start-up costs, maintenance costs, seasonal variations, and cost of intervention, including unintended consequences? Is the analytic time horizon long enough to capture the full costs and effects of programs?

Step 2: Develop a Cost Inventory

Identify and categorize resources for a program. Choose one categorization system or combine multiple categorization systems to develop a cost inventory.

Categorization System	Examples of Main Items To Consider
Line Item or Functional System	Personnel, facilities, equipment, supplies, travel, incentives, etc.
Levels of Responsibility	Federal, state, or local, etc.
Sources of Funding	Private for profit, private nonprofit, public, etc.
Activity Areas	Central office, district offices, or county clinics, etc.
Cost Types	Program costs, participant costs, costs to others, etc.

Step 3: Evaluate Resources Used

Using the categorization system from Step 2, measure the quantity of the resources used and assign value to them. Examples of sources to assess the resources used include the following:

- Primary data collection that includes questionnaire surveys, observational surveys, medical records, accounting, and payroll systems.
- Published literature or professional guidelines.

Step 4: Calculate Economic Evaluation Results

- Calculate the total program or intervention costs based on the information from Step 3.
- From a cost-of-illness analysis, calculate cost-savings caused by interventions.
- Calculate net cost by subtracting the cost-savings from total intervention costs.
- For Cost Analysis: Calculate average cost and marginal cost by using the net cost information.
- For Cost-Benefit Analysis, Cost-Utility Analysis, or Cost-Effectiveness Analysis: Calculate benefit to cost ratio (cost-benefit analysis), cost per quality-adjusted life years (cost-utility analysis), or cost-effectiveness ratio (cost-effectiveness analysis) by using net cost information and health outcome changes as a result of the intervention (from a program or effectiveness evaluation).

References

1. Task Force on Community Preventive Services. Understanding and using the economic evidence. In: Zaza S, Briss PA, Harris KW, eds. The Guide to Community Preventive Services: What Works to Promote Health? Atlanta (GA): Oxford University Press; 2005:449-63. http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780195151091.001.0001/acprof-9780195151091
2. CDC. Five-Part Series on Economic Evaluation Web site. http://www.cdc.gov/dhdsp/programs/spha/economic_evaluation/index.htm. Accessed June 18, 2014.

Program Evaluation Tip Sheet: **Reach and Impact**

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This tip sheet is intended for programs funded through the Centers for Disease Control and Prevention's (CDC) Division for Heart Disease and Stroke Prevention. This document offers working definitions of reach and impact (recognizing that there are many possible definitions), provides examples, and presents practical tips—it is not intended as a comprehensive guide to reach and impact.

What Is Reach? Reach is the extent to which a program attracts its intended audience.[1]

Key considerations:

- **Consider multiple levels:** Reach can be expressed as people, organizations, communities, etc. and is largely based on the intervention's scope.
- **Calculate a proportion:** Reach is calculated using a simple formula. The numerator (top number) represents the actual number served. The denominator (bottom number) represents the potential number served, which may be determined by your sphere of influence. For example: Your intervention has served 1,800 individuals (numerator). Participating health centers in your target area have a potential patient population of 3,000 (denominator). The reach is 60% of the patient population.

Reach Formula

Actual number of people or entities served

Potential number of people or entities served

= Percentage Reached

- **Define a geographic area:** Reach is based on the intervention's scope. As the intervention grows, so may the reach. The focus may move from specific counties or regions to the entire state.

What Is Impact? Impact is the effect that interventions have on people, organizations, or systems to influence health.[2]

Key considerations:

- **Make it measurable:** Impact is concrete, meaningful to stakeholders, and speaks to the value of your program.
- **Identify a realistic level of change:** Impact is how an intervention helps achieve public health goals. Since public health goals such as reduction in morbidity and mortality take time to occur, consider demonstrating impact using short-term change (e.g., reducing risk factors for hypertension and high cholesterol).

Why Measure Reach and Impact? Reach and impact are concise, objective, quantifiable measures of a program's progress. Reach and impact are essential to the following:

- **Demonstrate results:** Reach and impact offer program staff, partners, and funders a concise way of communicating the key accomplishments of a program.
- **Use as a management tool:** Reach and impact can help you track your program's achievements and progress from year to year.
- **Show accountability:** Policymakers and the public often ask who has been affected and what has been accomplished. We have a responsibility to demonstrate good stewardship of public funds. Program managers are better prepared to account for resources spent when they can speak to a program's reach and impact.

You may have been asked to describe your programin only a few sentences—reach and impact can give you the perfect elevator speech!

- **Present a national perspective:** CDC's ability to describe reach and impact is based on grantees' reporting of these measures, which results in a better understanding of progress made at the national level.

What About Data? When calculating reach and impact, ensure that your identified data sources are accessible. Data collection mechanisms can be monitored (if they already exist) or created (when feasible) to track progress. Possible data sources may include electronic medical records, population-based surveys, or legislative tracking databases.

Key considerations:

- Is a formal data-Wsharing agreement that specifies the format, frequency, and key individuals involved needed? If so, having an agreement early on will simplify the data collection process.
- How will change over time be measured? Will multiple data collection points be necessary?

Below are hypothetical examples of how reach and impact might be defined for three CDC programs, along with tips tailored to each respective program.

Grantee A: Paul Coverdell National Acute Stroke Registry	
Organizational Reach	28 out of a possible 72 (39%) accute care hospitals are participating in the registry
Individual Reach	16,200 patients are included in the registry out of a possible 28,733 (56%) patients
Impact	8,700 patients received defect-free care out of the 16,200 (54%) patients in the registry[3]

Tips

- **To define the denominator, it is critical to determine the total number of acute care hospitals in the state (note level of specificity).**
- **Compare like units, such as number of patients included in the registry and the number of potential patients. For instance, do not mix individuals with hospitals when calculating reach or impact.**

Grantee B: Well-Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN)	
Organizational Reach	5 screening sites out of a possible 14 (36%) federally qualified health centers
Individual Reach	1,250 low-income women aged 40–64 years screened out of a possible 2,200 (57%)
Impact	405 women reported a positive behavioral change in physical activity out of the 900 (45%) who received lifestyle interventions

Tips

- **Ideally provider sites should be categorized (i.e., Federally Qualified Health Centers, private clinics, local**
- **Keep in mind that the long-termimpact of WISEWOMAN lifestyle interventions is to foster heart health.**

Grantee C: National Heart Disease and Stroke Prevention Program	
Organizational Reach	24 out of a possible 52 (46%) community health centers use electronic medical records (EMRs)
Individual Reach	13,000 patients out of a possible 31,700 (41%) affected by use of EMRs
Impact	3,570 patients have achieved hypertension control out of the 9,400 (38%) hypertensive patients in the EMR

Tips

- **Keep in mind your purpose and scope—what are you trying to change and in what setting (i.e., work site, health care, or community)?**
- **While you may only have data to report immediate impact in terms of policy or systems change, do take steps—such as establishing data sharing agreements—to document the full range of change.**

Although the concepts of reach and impact may appear straightforward, take time to consider how you will apply them to the unique aspects of your program. To learn more about specific guidance available on this topic or for help defining reach and impact for your program, contact your project officer who can engage your evaluation consultant as needed.

Resources

1. Based on the work of: Basia B, Toober D, Glasgow RE. Program Planning: Overview and Applications. National Council on Aging & Center for Healthy Aging. Available at https://www.cdph.ca.gov/programs/cpns/Documents/Re-Aim_Brief.pdf
2. Based on the work of: Jillcott S, Ammerman A, Sommers J, Glasgow RE. Applying the RE-AIM framework to assess the public health impact of policy change. Ann Behav Med. 2007; 34(2):105–14.
3. "Defect-free care" is a descriptor that indicates whether patients received all of the quality-of-care measures for which they were eligible. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6007a2.htm