

## Comparison of Approaches to Measuring Cost Impact: Cost Benefit, Cost-Effectiveness, and Cost-Utility Analyses

Cost-benefit, cost-effectiveness, and cost-utility analyses are part of a group of methods that measure the efficiency of interventions and achieving desired outcomes. These types analyses can help organizations analyze the value of an intervention or program relative to its cost. While many talk about achieving ‘cost savings’, this is something of a misnomer since true cost savings are extremely difficult to document. These methods demonstrate whether the impact achieved is worth the costs/investment, build awareness of the value of a program, and inform decision-making about continued funding and sustainability.

	<b>Cost-Benefit Analysis (CBA)<sup>1</sup></b>	<b>Cost-Effectiveness Analysis (CEA)<sup>2</sup></b>	<b>Cost-Utility Analysis (CUA)<sup>3</sup></b>
<b>What it does:</b>	Determines which of alternative interventions with either the same or different objectives produces the greatest benefit	Determines which of alternative interventions produces: <ul style="list-style-type: none"> <li>• most of the desired outcome for level of expenditure, or;</li> <li>• costs the least given the level of outcome</li> </ul>	Compares cost-effectiveness across different types of interventions with different outcomes by comparing usefulness (utility) in a common metric
<b>How it is measured and calculated:</b>	<p><b>Costs</b> and <b>benefits</b> are all monetized (i.e. expressed as a dollar value)</p> <ul style="list-style-type: none"> <li>• Net benefit: Measured in monetized units at total benefits minus total cost;</li> <li>• Cost/benefit ratio (program cost as a ratio of the benefit)</li> <li>• Benefit to cost ratio (for every dollar spent on the program the dollar amount of benefit)</li> </ul>	<p><b>Costs</b> are measured in monetary units</p> <p><b>Effectiveness</b> is measured in non-monetary units and may include final or intermediate outcomes</p> <p>Compute a cost effectiveness ratio: monetary units (cost) per unit of desired outcome</p> <p><i>Bang for the buck analysis:</i>  <i>“This intervention costs \$\$\$ for each ED visit averted.”</i></p>	<p><b>Costs</b> are measured in monetary units</p> <p><b>Utility</b> is non-monetary and typically reported in</p> <ul style="list-style-type: none"> <li>• Years of life</li> <li>• Quality-adjusted life years (QALYs)</li> <li>• Disability-adjusted life years (DALYs)</li> <li>• Health utility index</li> </ul>

<sup>1</sup> D. White & T. Silloway. Cost –Benefit Analysis. *Evidence-Based Policymaking Collaborative*.

<http://www.evidencecollaborative.org/toolkits/cost-benefit-analysis>. (accessed 10/12/17).

<sup>2</sup> L. B. Russell. (2015). Population Health: Behavioral and social science insights. *Agency for Healthcare Research and Quality*.

<https://www.ahrq.gov/professionals/education/curriculum-tools/population-health/russell.html> (Accessed 10/12/17)

<sup>3</sup> F. Fleming. (2014). Cost Utility Analysis. *Better Evaluation*. [https://www.betterevaluation.org/evaluation-options/cost\\_utility\\_analysis](https://www.betterevaluation.org/evaluation-options/cost_utility_analysis). (accessed 10/17/17).

	<b>Cost-Benefit Analysis (CBA)<sup>1</sup></b>	<b>Cost-Effectiveness Analysis (CEA)<sup>2</sup></b>	<b>Cost-Utility Analysis (CUA)<sup>3</sup></b>
<b>Strengths</b>	<ul style="list-style-type: none"> <li>• Units are easily understandable by staff, board members, and funders</li> <li>• Only measurement that shows whether the monetary benefits of an intervention exceed its cost</li> </ul>	<ul style="list-style-type: none"> <li>• Shows the programmatic results by their impact on clients/ patients served</li> <li>• Makes results comparable to other interventions with same outcome</li> <li>• More appropriate for social and health programs where benefits cannot be easily monetized</li> </ul>	<ul style="list-style-type: none"> <li>• Makes it easy to compare two interventions or programs</li> <li>• Shows the specific cost per QALY, which makes these unit costs comparable across programs and interventions</li> </ul>
<b>Challenges</b>	<ul style="list-style-type: none"> <li>• Assumes all benefits can be monetized</li> <li>• Can be costly and complex to undertake</li> </ul>	May exclude other potential benefits or outcomes of a program	<ul style="list-style-type: none"> <li>• Very complicated to measure</li> <li>• Requires judgements about what level of QALY gains are worthwhile</li> </ul>
<b>Example</b>	World Health Organization analysis of the cost of improving care for depression and anxiety in 36 countries the total cost of improving care estimated as \$147 billion while benefits were estimated at about \$500 billion, making up to a 5.7 benefit-to-cost ratio <sup>4</sup>	A multisite managed care health plan in Wisconsin sought to improve breast and cervical cancer screening for low income women by sending a reminder letter signed by their primary care physician and follow up by a RN to assess barriers. Study found that women receiving the intervention were 4 times as likely to be screened with a cost effectiveness ratio of \$28.93 per screening test	Researchers studied the impacts of the <i>Texercise Select</i> program, which is a community-based program to improve healthy living among older adults. The study showed that <i>Texercise</i> cost \$1374-\$1452 per QALY gained, well under the threshold of \$50,000 per QALY <sup>5</sup>

<sup>4</sup> Melville, N. A. Benefits of Mental Health Treatment far Outweigh Costs: WHO. *Medscape*. <https://www.medscape.com/viewarticle/861853>. (accessed 10/17/17).

<sup>5</sup> Akanni, O. O., Smith, M. L., & Ory, M. G. (2017). Cost-effectiveness of a community exercise and nutrition program for older adults: *Texercise Select*. *Int J Environ Res Public Health*, 20(15). doi: 10.3390/ijerph14050545. (accessed 10/17/17).

## Resources :

- P. Lantz et. al. (1995). Breast and Cervical Cancer Screening in a Low-Income Managed Care Sample: the efficacy of physician letters and phone calls
- C. McCabe. (2009). *What is Cost-Utility Analysis?* (Newmarket, UK: Hayward Medical Communications).  
[http://www.bandolier.org.uk/painres/download/whatis/What\\_is\\_cost-util.pdf](http://www.bandolier.org.uk/painres/download/whatis/What_is_cost-util.pdf)
- P. M. Vanhook. (2007). Cost-utility analysis: a method of quantifying the value of registered nurses. *The online journal of issues in nursing*, 12(3).  
<http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TabelleofContents/Volume122007/No3Sept07/CostUtilityAnalysis.html>
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<https://people.hofstra.edu/geotrans/eng/methods/ch9m1en.html>
- World Bank. (2005). *Where to use cost-effectiveness techniques rather than cost-benefit analysis*. (Washington, DC: The World Bank).  
<http://documents.worldbank.org/curated/en/540451468154490419/pdf/339300rev.pdf>.
- National Information Center on Health Services Research and Health Care Technology. (n.d.). *Module 4: an introduction to the principles of critical appraisal of health economic evaluation studies*. (Bethesda, MD: U.S. National Library of Medicine).  
[https://www.nlm.nih.gov/nichsr/edu/healthecon/04\\_he\\_03.html](https://www.nlm.nih.gov/nichsr/edu/healthecon/04_he_03.html)
- T. Watkins. (n.d.) An Introduction to Cost Benefit Analysis. *San Jose State University Department of Economics*. <http://www.sjsu.edu/faculty/watkins/cba.htm>.
- CDC. (n.d.). *Part v: cost-effectiveness analysis: outcomes in natural units*. (Atlanta, GA: Centers of Disease Control and Prevention).  
[https://www.cdc.gov/dhdsp/programs/spha/economic\\_evaluation/docs/podcast\\_v.pdf](https://www.cdc.gov/dhdsp/programs/spha/economic_evaluation/docs/podcast_v.pdf)