EVALUATION TOOLKIT: TOOL #3

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Economic Impact: Finding the right analysis for your evaluation needs

A TOOL FOR SOCIAL ENTERPRISES IN HEALTH







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Social enterprises in health in a lowand middle-income country promoting innovations: products, services, programs, interventions, or technologies and interested in:

- Knowing more about costeffectiveness or economic impact,
- Determining what economic impact statements can be made about their innovations
- Guidance on selecting an appropriate type of economic analysis and the necessary steps and resources to conduct it

SECTION 1

Introduction



WHAT THIS TOOL IS

This tool assists social enterprises in health choose the type of economic analysis that best suits their evaluation needs for measuring their economic impact. The tool provides:

- A brief overview of 7 types of economic analysis, followed by a more in-depth description of the steps involved in, information needed, and resources required for each of the analyses:
 - o Cost Analysis
 - o Cost-Minimization Analysis
 - o Cost-Consequence Analysis
 - o Cost-Effectiveness Analysis
 - o Cost-Utility Analysis
 - o Cost-Benefit Analysis, and
 - o Budget Impact Analysis
- Examples of economic impact questions social enterprises may want to ask about their innovations, and links to the type of analysis required to answer those questions,
- Visual comparisons between the types of analyses, and
- A curated list of resources that can help you or a consultant conduct economic analyses



WHAT THIS TOOL IS NOT

By itself, this tool is not sufficient to conduct an economic analysis. It is

intended to help an enterprise determine which economic analysis is their best fit, directing the user to additional resources for the next step of conducting the analysis. While the tool will provide background information on the methods involved in certain evaluations, having an external consultant or an in-house data professional – or both – is highly recommended!

ECONOMIC TERMS AND CONSIDERATIONS

Understanding a **stakeholder's perspective** in an economic analysis means considering all the ways your innovation would impact them. Consider all the associated costs, consequences, and benefits. The stakeholder, in some cases, will be your enterprise!

If you are collecting your own data, strive for a **representative sample**, where you collect data from a subset that accurately reflects the larger group represented. Consider demographic differences such as gender, socio-economic status, health conditions, geography, etc...

Donors or investors seek evidence of "**cost-effectiveness**", but they are not necessarily looking for a costeffectiveness analysis (CEA) specifically. Multiple types of economic analysis are able to demonstrate an innovation's affordability and effectiveness.



HOW DO I USE THIS TOOL?

• To pinpoint key economic question(s) you want answered, or a critical economic impact statement.

• Understand what each type of economic analysis entails and how they differ.

SECTION 2

Economic Impact Statements and Questions

There are two ways to think about impact: You have a statement you would like to make about your impact, or you have a question you would like answered about your impact.

Read through the impact statements and evaluation questions paired below. Which pairings resonate with you? Read on for more detail on how to answer those questions or make the statements that resonate with you.

Impact Statement: Our innovation results in lower out-of-pocket costs to the patient. Economic Question: Do our products or services help patients by lowering their out-of-pocket cost per visit, or by saving them time (and thus saving lost wages)? SIMILAR STATEMENTS & QUESTIONS Statements Our innovation reduces the amount of time patients and their families spend on average in the facility. A facility that uses our innovation uses less of X, which results in a lower cost to the patient. Patients and/or families of patients save \$X by purchasing our product as opposed to purchasing the alternative from a facility. Question How much do patients save by using our innovation versus the standard of care, their usual alternative?

REQUIRED INFORMATION

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Defined Target Population: Who makes up your patient population affected by these lower costs? Is your product being used in rural or urban areas, or both? Government facilities, private facilities? For example, suppose that you sell a product that monitors blood sugar for patients with Type 2 diabetes in India. In addition to knowing your patient population is "people with diabetes", it would also be

SUGGESTIONS FOR ANALYSIS - Cost-Minimization:

Cost-Minimization Analysis would be recommended here when looking at the perspective of a patient, because we're looking at out-of-pocket expenses for two alternative treatments that yield the same healthcare outcomes. - Cost-Effectiveness

good to know their distribution across geography, socio-economic status, ethnicity, gender, etc.

Identified Comparator: To make these data compelling, you will need a comparator. This means, to support your claims, you will need to compare the costs that are incurred by a patient when your innovation is used with the costs incurred by a patient when the standard alternative is used (or whatever would be used in the absence of your innovation). Consider the blood sugar monitoring device example. The "alternative" could be either a different monitoring device or visits to a provider to measure, depending on who the product is reaching.

Collect Data: Finding comparison data may involve market surveys, where data is collected from facilities or enterprises available to your target population that are alternatives to your innovation. Collect cost data on services or tests a patient would encounter at such a comparison facility to compare it with costs a similar patient would encounter when using your innovation. Alternatively, you could work with a representative sample of the facilities using your innovation and obtain information on how out-of-pocket costs changed when your innovation was introduced (i.e., the cost of test X reduced by \$Y which translated to a \$Z decrease in cost to the patient).

Impact Statement: Our innovation is of a higher quality than the alternatives, and costs the same.

Economic Question: We believe our innovation is of a higher quality and/or cheaper than the alternatives already in use in our target regions, but is it actually? By how much?

SIMILAR STATE	MENTS & QUESTIONS
Statement	 Our product/service may cost \$X more than an alternative, but its impact on health outcomes justifies the price.
Question	 Does our product, which assists in X, make the process of X cheaper? When taking into account the higher quality we believe our product has compared to current alternatives, is our product "cheaper" than those alternatives? Does our product yield outcomes that justify the higher price?
•	SUGGESTIONS FOR ANALYSIS -

REQUIRED INFORMATION

Post-Renefit: - Cost-Consequence

To answer a question like this, you will need to first distinguish clearly who it is you will be estimating costs for and only consider costs incurred by that stakeholder when conducting your analysis.

Costs & Benefits Monetized from a Stakeholder Perspective: You will then need to estimate the costs incurred by your stakeholder when purchasing/using your product as well as the costs incurred when purchasing/using the alternatives with which you want to compare. This is where the distinction between a cost-benefit analysis and a cost-consequence analysis become more clear. What you must ask is, can all the costs and all the benefits incurred by our stakeholder when purchasing/using our product or an alternative be quantified? In other words, can we place a monetary value on all of these costs and benefits? If the answer is yes, then a cost-benefit analysis may be the right choice for you.

A Mix of Monetized & Qualitative Costs & Benefits: However, it is not always the case that a monetary value can be placed on every cost and benefit. If some of the costs you want to estimate for your stakeholder include things like time waited, differences

in "ease of use" of the product, etc. then a cost-benefit analysis will not be able to capture the true difference in costs between your product and the alternatives. In this case, a cost-consequence analysis would be more appropriate.

Impact Statement: Our innovation has positive long-term effects on our customers' lives (makes some part of daily life easier/better, contributes positively to their long term health, prevents more serious health problems, etc.).

Economic Question: Does our product have returns on long-term health that may not be immediately apparent for our clients?

SIMILAR STATEMENTS & QUESTIONS

Statement

Question

- Does our product, which assists in X, make the process of Y cheaper?
- When taking into account the higher quality we believe our product has compared to current alternatives, is our product "cheaper" than those alternatives?

• Our product may cost \$X more than an alternative, but its impact on health outcomes

• Does our product yield outcomes that justify the higher price?

REQUIRED INFORMATION

Long-term Health Impact: It would not be an easy task for entrepreneurs to establish the long-term impact of their interventions- especially since this would require a longitudinal study, and subsequently quantifying the

justify the price.

SUGGESTIONS FOR ANALYSIS - Cost-Utility:

A Cost-Utility Analysis would be ideal in this situation; given that it would take into account long term impacts on health through the Quality Adjusted Life Years (QALY) metric.

findings. Therefore, it is best to either delegate the task to clinical experts, or, if applicable, incorporate existing clinical research into their economic analysis.

Such a study requires data that is collected potentially over many years and you would need to be able to control for other factors that could subsequently be influencing whatever future outcomes they are planning to measure. For example, if life expectancy was your outcome, you would want to keep track of other changes in the environment of your patients that could also be influencing life expectancy (e.g. better access to clean water, higher incomes, better healthcare access, etc.). The most accessible method to conduct such studies, though, apart from delegating the task to clinical researchers, would be to use existing clinical research data that arise from studying interventions and health procedures similar to your service or product.

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Impact Statement: By using our innovation rather than the standard of care/typical product, facilities save money by incurring less cost.

Economic Question: Do facilities save money over time, or for certain procedures, by using our innovation?

REQUIRED INFORMATION

Facility-Level Costs: Social enterprises might provide certain services and products to hospitals or other healthcare facilities to lower the costs they incur, and by extension, they may also lower the costs patients incur. Analyzing how much facilities save by using your innovation, though, you must adopt the perspective of the facility, and collect information on costs that are borne by

SUGGESTIONS FOR ANALYSIS Cost-Minimization

Cost-Benefit

Cost-Consequence

the facility, particular to the procedure or procedures in which your innovation hopes to have an influence.

Economic Question: We are considering multiple designs for our innova	ation, which one has the most value?
 SIMILAR STATEMENTS & QUESTIONS Questions What is the difference in total cost between creating our innov alternative design? Among the options available to us, what is the cheapest way to How much will it cost us to produce/manufacture our innovati We are considering making X change to our production process, what effect could it have on our costs? REQUIRED INFORMATION Actual & Projected Internal Costs: This is primarily an internal 	vation using our current design versus o manufacture/generate our innovation? ion? SUGGESTIONS FOR ANALYSIS Cost Analysis Cost-Minimization Budget Impact
question for organizations, which for many enterprises is an advantage $~^{ m L}$	
since most, if not all, of the data collection can be done in-house easily an straightforward. Information needed includes detailed receipts or cost pro make up production costs (real or potential). You will also need to keep in (e.g., if one option causes an indirect cost later in time, or if one option has	d affordably. The analysis is fairly ojections for all the components that mind potential implicit costs/savings s better economies of scale).
Impact Statement: Compared to the standard of care, our innovation i	is more effective and no more costly
Economic Question: Is our innovation more "cost-effective" than curren	nt alternatives?
SIMILAR STATEMENTS & QUESTIONS	
 Questions Our innovation achieves the same results as X (the cudoes it do so at a lower cost? Although our innovation may be slightly more expenimarket, can it achieve X (some result) faster (or more certainty, etc.)? 	urrent or status quo option) but nsive than what is currently on the e reliably, with more confidence/
 A service or product can be one of two things to be "cost-effective": 1. Less costly than the standard of care, and resulting in same or bet 2. At a cost that the payer is willing to pay for resulting better outcost to pay up to a threshold of \$50,000 per quality-adjusted life year (QA) 	tter clinical outcomes, or mes (e.g., a payer could be willing
decrease in mL of mercury for those with diabetes	 ALY) or \$500 per additional SUGGESTIONS FOR ANALYSIS -

Impact Statement: Our method, through our analysis, is the cheapest method through which to conduct

REQUIRED INFORMATION

our service/ build our product.

The Innovation's "Full" Cost: "Full" cost information of your product and of the status quo alternatives - this includes not only the market value of the product/ alternatives, but also all the costs that go into its use (transaction costs, costs

of complementary items/actions, training costs, etc.). "Benefits" information - are there certain benefits that either reduce/counteract cost burden or are an improvement upon status quo alternatives? Can these benefits be quantified (in monetary terms or in time-saved)? Remember, cost data must be with respect to just one stakeholder.

Consumer Cost Data: Access to consumers - to obtain cost data, you will need to be able to contact consumers and collect information on the costs they incur in using your product as well as the costs they incur using status quo alternatives.

Cost-Effectiveness

Cost-Consequence

Cost-Benefit

SECTION 3

Understanding Types of Economic Analysis

Looking for a bigger picture on how the analyses compare to one another? These aids may help provide you with a better understanding of how the types of analyses differ and relate to one another.

Descriptions of Economic Analyses and Required Resources

A quick guide to seven types of analyses possible in healthcare: Cost-Analysis (CA), Cost-Minimization Analysis (CMA), Cost-Consequence Analysis (CCA), Cost-Effectiveness Analysis (CEA), Cost-Utility Analysis (CUA), Cost-Benefit Analysis (CBA) and Budget Impact Analysis (BIA):

SECTION CONTENTS

- Descriptions
 - o Cost Analysis
 - o Cost-Minimization Analysis
 - o Cost-Consequence Analysis
 - o Cost-Effectiveness Analysis
 - o Budget Impact Analysis
 - o Cost-Benefit Analysis
- o Cost-Utility Analysis
- Flowchart

COST ANALYSIS

Assesses costs of implementing a product, service, or technology.

ASSESSES THE COSTS:

- to implement an innovation (i.e., intervention, program, service),
- of the innovation itself, including opportunity and/or hidden costs, and
- of how the innovation impacts the use of other health care resources.

WHAT ELSE MAKES IT A COST ANALYSIS (CA)?

- It considers only the intervention, not a comparator. It can be appropriate when a novel service is implemented, like a telemedicine intervention.
 - o If using a comparator, refer to a cost-minimization or cost-benefit analysis.
- It is the most basic type of analysis.
- It determines how to attribute a per-patient cost.
- Complexities to consider are that few understand the costs and full scope of costs of new innovative products.

Example statement from a Cost-Analysis:

To implement diabetes care at our clinic, we anticipate it will cost our facility \$520 each month.

CONDUCTING A COST ANALYSIS

Opportunity Costs & Hidden Costs

The difference between a simple analysis of financial costs of an intervention program and an economic analysis is the inclusion of opportunity costs or hidden costs. Especially if you are looking at a healthcare program's cost to society, costing an innovation or program is not straightforward.

For example, let's say that a town partners with a local gym to provide the gym with free equipment, and in return, the gym provides the elderly free access. A financial analysis will limit the costs of the program to the town at the cost of procurement and delivery of the equipment. However, a cost analysis at the societal level will include hidden costs. For example, there are 'per individual' costs due to the influx of the elderly members, including costs for utilities, costs for the gym staff (which are probably borne by the gym) and so forth. How do you find out about hidden costs? Reviewing literature on past cost analyses can give you an idea; for example, if you have a Community Health Worker project, looking at CAs for other community health worker projects can be great exercises in learning about relevant (hidden and explicit) costs.

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Necessary Resources

A CA is fairly straightforward and does not require extensive resources.

Time

You must be willing to invest the time of your dedicated staff person in gathering cost data on your interventions.

Budget

A CA is generally not an expensive endeavor. The primary cost is staff time.

Personnel

An essential resource is a point person strongly capable of bookkeeping: they should be able to account comprehensively for the costs of your innovation (i.e. product/service/technology). Depending on the perspective you adopt in your analysis, the resource person might need to have access to, or be a part of, your health facility or one with which you partner.



Data Requirements & Next Steps

Below is a step-by-step guide of what a CA entails based on Centers for Disease Control and Prevention (CDC) resources. These steps may clarify what data are needed:

- Define the scope and timeframe of your cost analysis organizational perspective or societal perspective? Shortterm, long-term, lifetime?
- Review and assess the literature to understand costs from different perspectives.
- **Develop cost categories**: Costs will need to be assessed for each category, taking your defined timeframe into account. Typical categories include:
 - o Labor/personnel
 - o Space and utilities
 - o Travel costs
 - o Supplies, materials, equipment
 - o Other
- **Collect data and conduct cost calculations**—this is the crux of cost analysis and the most important, but also the most intuitive once you know what costs you need to measure.

Resources

- Chandler, Rudolf. Costing and Budgeting Tools at the Decentralized Level: State of the Art. USAID. 2011.
- Centers for Disease Control and Prevention (CDC). CDC Coffee Break: Conducting a Cost Analysis.
 Slides accessed at: <u>https://www.cdc.gov/dhdsp/pubs/docs/cb_january_2013.pdf</u>
- Centers for Disease Control and Prevention (CDC). Five-Part Webcast on Economic Evaluation. August 2016.
 Webcasts and slides accessed at: <u>https://www.cdc.gov/dhdsp/programs/spha/economic_evaluation/</u>
- WHO. Costing Tools. The Partnership for Maternal, Newborn, and Child Health. World Health Organization. Accessed at

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- Drummond, M, O'Brien, B, Stoddart, G., Torrance, G. "Methods for the Economic Evaluation of Health Care Programmes". Oxford Medical Publications. 2nd edition. 1997.
- IATT Toolkit, Expanding and Simplifying Treatment for Pregnant Women Living with HIV: Managing the Transition to Option B/B+. Ch 6: Costing Tool. The Interagency Task Team in the Prevention and Treatment of HIV Infection in Pregnant Women, Mothers and Children. 2015.
- Paxton, Alexander; Carvalho, Nadia. "HIV/AIDS Program Costing Tools: Concepts and Methods Used under the USAID". Health Policy Initiative, Costing Task Order. USAID. 2013.
- Rosen, James E. Economic Evaluation: Guide to approaches for public health supply chains. USAID | DELIVER Project, Task Order 4. 2014.
- U.S. Dept. of Health and Human Services, U.S. Public Health Service, Centers for Disease Control and Prevention. Applying Cost Analysis to Public Health Programs: A Self-Study Course with Exercises and Case-Study Questions. 2000.

A COST-MINIMIZATION ANALYSIS IS A COMPARISON OF THE COSTS:

- incurred by the typical patient in the innovation group,
- versus a control, a non-innovator usual care group, or an alternative innovator product.

WHAT ELSE MAKES IT A COST-MINIMIZATION ANALYSIS (CMA)?

- An implicit assumption that the effectiveness of the treatment alternatives is equal or has already been implemented and will remain unchanged.
- For example, economic analysis alongside clinical trials designed to show equivalence of a new treatment to usual care would be a CMA.
- A CMA is sometimes called a cost-savings analysis, but we recommend avoiding its use since it implies a cost savings prior to the analysis.

Example statement from a Cost-Minimization Analysis:

Glaucoma testing with our device costs facilities an average of \$100/year, whereas testing with the current standard device costs \$140/year.

CONDUCTING A COST-MINIMIZATION ANALYSIS

A CMA requires the same kind of data as for a CA, but the data will also include costs of other options--the comparators. You may need to think carefully about potential future costs incurred under your innovation versus the comparator (e.g., your innovation uses a cheaper machine, but requires the machine to be replaced more frequently). The intent is to capture all costs associated with the innovation operation and/or production that are relevant to alternative options. Since a CMA assumes equal effectiveness of all options, you will also need to provide evidence of equal effectiveness.

Time

You must be willing to invest the time of your dedicated staff person in gathering cost data on your interventions, and assembling literature that establishes the equivalence of an innovation and the comparator.

Personnel

An essential resource is a point person strongly capable of bookkeeping: they should be able to account comprehensively for the costs of your innovation (i.e. product/service/technology). Depending on the comparator(s) used, the resource person might need to have access to, or be a part of, your health facility or one with which you partner. This resource person, or another, must be able to establish the equivalence of two different innovations - your innovation and the standard of care, for example - which may entail a literature review.



Data Requirements & Next Steps

- **Define the problem**, and establish objectives for your end-product which could be a stronger impact statement or data on your profitability that can be conveyed to investors.
- Identify the innovation being studied and the alternatives, which are your comparators.
- Provide evidence suggesting equivalent effectiveness between your innovation and your comparators.
- Define the analysis perspective and timeframe: patient, facility, or societal level? Short-term, long-term, lifetime?
- Identify and record all cost data
- Discount future costs at real interest rates
- Present comparison cost data between your innovation and the comparator(s) or your alternative innovation.



Resources

- Drummond, M, O'Brien, B, Stoddart, G., Torrance, G. "Methods for the Economic Evaluation of Health Care Programmes". Oxford Medical Publications. 2nd edition. 1997.
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COST-CONSEQUENCE ANALYSIS

Compares costs and outcome across products, services, or technologies quantitatively and qualitatively.

SIMPLEST FORM OF ANALYSIS THAT SEPARATES THE COSTS AND OUTCOMES

- Compares the costs and outcomes of one product, service, or technology to the costs and outcomes of another product, service, or technology.
- Costs are calculated as in a CMA, but outcomes are also included.
- There is no assumption that the options being compared to one another will have the same outcome.

WHAT ELSE MAKES IT A COST-CONSEQUENCE ANALYSIS (CCA)?

- In CCA, information regarding all outcomes, be it intermediate measures such as reduction in mmHg for blood pressure or A1c for diabetes or reduction in readmission rate that could be useful for decision makers, are listed separately.
- There is no explicit attempt to combine outcome information with cost information, such as via a cost-effectiveness ratio.
- The intent of a CCA is to let the audience weigh benefits and costs themselves. The analysis results do not provide a value judgment on the trade-offs between costs, the potential savings, and the innovation's outcomes.

Example Statement from a Cost Consequence Analysis:

Our network maternity hospitals spend \$2.50/delivery using clean birth kits whereas network hospitals using in-house equipment spend \$2/delivery. However, providers indicate that the convenience of using kits and patient preference are highly valuable attributes of the clean birth kits. In addition, providers across all network hospitals indicated higher confidence in access to sterile instruments from the clean birth kit compared to assisted deliveries without the kits.

CONDUCTING A COST-CONSEQUENCE ANALYSIS

Unlike a CA or CMA, which assess only the costs of implementing an innovation, a CCA assesses the costs of implementation as well as considering the results, or outcomes of the innovation and its alternatives (also called comparators). Additionally, outcomes of an innovation do not have to be quantified with cost information in a CCA as they are in other forms of analysis. Outcomes, such as reduced stillbirths, can be presented descriptively without quantifying the cost value of each outcome.

All relevant costs and consequences for the selected innovations or options are presented for reviewers to determine themselves which option would be the preferred alternative. A CCA is a flexible analysis. You are not confined to a particular perspective and can choose different costs and benefits (whether they fall on patients, families, health facilities, or society). This kind of analysis is especially useful when there are no clear-cut comparators, or a comparison is not entirely straightforward.



Personnel

A CCA requires more staff time than a CA or CMA, and may well require hiring consultants. In addition to gathering cost information for your innovation, you will also need to collect qualitative data via observations, interviews, and other means in order to estimate aggregate costs and consequences/benefits. These responsibilities take effort and require specialized expertise (e.g. ability to conduct qualitative interviews).

Time

There is a significant time commitment required in conducting a CCA- not only do you need to compile costs to your innovation and its outcomes, you also need cost information on alternative products and their outcomes. This will likely be included by a consultant, but if you have a dedicated member of your existing staff committed to a CCA, you will need to consider their time as an investment.



Budget

Funds and resources will be needed to have a dedicated staff member and/or a consultant. If you are conducting interviews or following clients or patients over time, you will need to cover costs of data collection, personnel, communications, and potentially travel.



Protocol/Plan

Conducting a CCA cannot be ad-hoc! It takes preparation, and a protocol or research plan.



Resources

To give you an idea of what type of data would be collected in a CCA, take a look at this <u>generic template</u>. It contains a model of a spreadsheet that could be completed during data collection.

- Drummond, M, O'Brien, B, Stoddart, G., Torrance, G. "Methods for the Economic Evaluation of Health Care Programmes". Oxford Medical Publications. 2nd edition. 1997.
- Hunter, R. & Shearer, J. Cost-consequence analysis an underused method of economic evaluation. Research Design Service. Accessed at <u>http://www.rds-london.nihr.ac.uk/Howto-design-a-study-find-funding/Health-economics/Costconsequences-analysis.aspx.</u>



A COST-EFFECTIVENESS ANALYSIS IS WHERE

• Costs and outcomes are presented as a ratio.

WHAT ELSE MAKES IT A COST EFFECTIVENESS ANALYSIS (CEA)?

- CEA results are presented as an incremental cost-effectiveness ratio (ICER), where the additional costs of an
 intervention (unless it happens to be cost-saving) is in the numerator and the additional effectiveness achieved is in
 the denominator.
- As with the CCA, the effectiveness can be whatever outcomes are deemed relevant to the decision-makers.
- Outcomes are measured in natural units, like Life Years Saved.

Example Statement from a Cost-Effectiveness Analysis:

Compared to current practice, for every additional \$800 spent training 100 cardiac patients and their families on health skills, readmission rates due to post-surgical complications are reduced by an additional 10%.

CONDUCTING A COST-EFFECTIVENESS ANALYSIS

Like a CCA, CEA takes into account the outcomes from a healthcare intervention, service or product. In the case of a CEA, the outcomes are measured in natural units. A natural unit could be Life Years Saved, decreases in blood sugar levels, decreases in diastolic blood pressure, amongst a number of choices. However, for any given CEA, there can be only one natural unit used to examine an intervention/service/product.

When donors or investors ask for evidence of 'cost-effectiveness', they are not necessarily asking for a CEA. Costeffectiveness can be demonstrated through any economic analysis. Use the opportunity to explore with the donor or investor what type of evidence satisfies the donor/investor and is an effective use of your organization's time and efforts.

Necessary Resources

CEAs are often conducted alongside a clinical trial to best capture the costs alongside measureable health outcomes. If a CEA is not conducted alongside a clinical trial, we would not recommend a CEA to social enterprises in health due to the complexity and time-requirements.

Budget \$\$\$ A CI

A CEA is an investment. The costs are high in terms of personnel and study activities and management. In the case of a social enterprise in health, a CEA would likely be undertaken as an investment, with the understanding that future growth and funding is dependent on the CEA results.



There is a significant time commitment required in conducting a CEA. One advantage to a CEA is that the outcomes are limited to your selected natural unit. You will not be reviewing and assessing all possible outcomes. Aside from the time required to set-up and conduct a CEA alongside a clinical trial, you'll need to take into account the length of time needed to see and assess expected outcomes.



Personnel

Hiring an external consultant, expert, or contracting a partner organization will almost always be necessary to navigate the complexity of a CEA and a clinical trial. A team will be necessary for a clinical trial, with backgrounds in clinical, research, and/or economics. Partnering with other organizations would be likely.

1.2.3 A pr

A protocol

Conducting a CEA requires preparation, and a protocol or research plan. A clinical trial will require protocol review and approval by an ethics committee and possibly other government approvals. Research conducted on human subjects requires ethical certification for anyone involved with the study and, in most cases, informed consent from participants. Investigate all requirements prior to starting your economic analysis.



Resources

- Chandler, Rudolf. Costing and Budgeting Tools at the Decentralized Level: State of the Art. USAID. 2011.
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- Wilkinson, T.; Chalkidou, K., Walker, D., Lopert, R. <u>Methods for Economic Evaluation Project: Final Project.</u> Bill and Melinda Gates Foundation. NICE International. January 2014.

COST UTILITY ANALYSIS IS A FORM OF CEA FOR WHICH

• Outcomes are standardized and quantified in terms of Quality Adjusted Life Years (QALYs) saved or gained.

WHAT ELSE MAKES IT A COST-UTILITY ANALYSIS (CUA)?

- CUAs developed to help make large-scale resource allocation decisions across different health conditions or interventions.
- QALYs express effectiveness both as a measure of **quality** of health outcome as well as the life years added, or the **quantity** of the health outcome.
- Interventions for different health conditions can be directly compared with QALYs.

Example of Statement Arising from Cost-Utility Analysis:

For every additional \$1,000 spent on training family facilitators to serve 100 patients with severe mental health conditions, an additional 3 QALYs per patient are gained.

CONDUCTING A COST-UTILITY ANALYSIS

The process of a CUA mirrors that of a CEA except in communicating the health outcomes in terms of QALYS. Costs are calculated just as they are in a CEA.

Necessary Resources

Long-term outcomes are generally key outcomes of interest in a CUA. As such, obtaining the necessary QALY data requires either conducting a long-term study or an intensive review of existing clinical data.

The resources required for a CUA are variable, depending on whether you are conducting a long-term clinical study, combining a clinical study along with a review of existing literature on clinical outcomes, or solely gathering cost data and reviewing existing literature. Consider a healthcare innovation that reduces blood sugar by a certain amount of time. You will need clinical data to deduce how many years of life that blood sugar reduction will result in, as well as any data on the quality of health outcomes.

If a clinical trial is involved with your CUA, consider the resources required for a CEA as a bare minimum.



Personnel

Regardless of how a CUA is conducted, it is a complicated analysis. Contracting someone with economic expertise and a thorough understanding of QALYs or partnering with another experienced organization is recommended.



The amount of time spent is dependent on how the analysis is conducted. A long-term clinical study would easily extend years or decades. Gathering cost data and reviewing existing literature will take much less time, but be aware there may not be enough existing quality data to have confidence in your findings.

Budget

As with a CEA, a CUA is an organizational investment. Costs are high regardless of how the analysis is conducted. Before committing to the costs of a CUA, an organization should well understand the costs, likely results, alternatives to a CUA, and the importance of the CUA findings.



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COST-BENEFIT ANALYSIS

Quantifies and combines cost and outcome information into an ultimate monetary gain or loss.

IN A COST-BENEFIT ANALYSIS:

- Cost and consequence data are combined and quantified into monetary values.
- An ultimate net gain or loss is presented.

WHAT ELSE MAKES IT A COST BENEFIT ANALYSIS (CBA)?

• Results show if the monetary value of the benefits exceeds the cost to implement and utilize the intervention.



Example Statement from a Cost-Benefit Analysis:

With our online training program for providers and community health workers, we project a net benefit of \$500,000 to India's State of Bihar health system over the next decade.

CONDUCTING A COST-BENEFIT ANALYSIS

Key to a CBA is being able to list every cost and benefit associated with a innovation in monetary terms, and doing so accurately. This will likely involve collecting cost/benefit data from multiple sources, forming a representative sample of the customer (i.e. facility, individual) and estimating average costs/benefits. Take specific care to not doublecount factors as both a benefit and a cost-savings. For example, if the innovation reduces hospital readmission rates, it can be counted on the benefit side or a cost-savings on the cost side of the ledger, but cannot be counted on both sides.

Cutting costs by limiting too much the amount of data you collect or your coverage will not only weaken the robustness of your analysis, but it will likely make it too weak to be able to validate your findings. If you find that the suggested budget for this kind of analysis is out of your price range it may be best to consider something simpler and modifying the question you want to answer (or statement you would like to be able to make).



Necessary Resources

In a CBA, as with many of the other analyses, the resources required are variable. A CBA requires looking at the costs and benefits of an innovation broadly, even if you have selected a narrow perspective, such as a patient perspective. Attention should be paid to whether cutting costs or reducing analysis resources could limit the data you collect or weaken the coverage and robustness of your findings.



Personnel

A CBA requires more staff time than a CA or CMA, but likely less staff time than a CEA or CUA. Assuming an applied economist is not on-staff, hiring an external consultant or expert is highly recommended to ensure a quality CBA. It will be necessary to have a strong grasp of quantifying costs and benefits as monetary values, particularly when their value is not obvious.



Time

A significant time commitment is required to conduct a CBA. As with a CCA, not only do you need to calculate the costs and benefits of your innovation and its outcomes, you also need comparative cost information on alternative products and their outcomes.



Budget

Funds and resources will be needed to have a dedicated staff member and/or a consultant. If you are following clients or patients over time, you will need to cover costs of data collection and associated personnel time.



Resources

- Asian Development Bank. Cost-Benefit Analysis for Development: A Practical Guide. Asian Development Bank. 2013.
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A BUDGET IMPACT ANALYSIS (BIA) IS A FORM OF COST ANALYSIS:

· Designed to estimate the expenditures that are likely to occur to widely implement an intervention program in order to assess its feasibility

WHAT ELSE MAKES IT A BUDGET IMPACT ANALYSIS (BIA)?

- It is often used to forecast budget needs.
- Takes the provider or payer's perspective.
- The time horizon is shorter, usually around 1-3 years.
- It assumes the intervention or program being evaluated is effective or can be known to be effective or not.

Example Statement from a Cost-Benefit Analysis:

Our intervention of providing all surgical patients with counseling education will cost an additional \$100,000/year for the first year and then approximately \$20,000/year afterward.

CONDUCTING A BUDGET IMPACT ANALYSIS

While most other economic analyses focus on economic costs and opportunity costs, a BIA is about accounting costs, or the transaction price, like pay for nurses and doctors, availability and cost of equipment, and projecting the amount of patients and their payments. A BIA attempts to calculate the total costs of an intervention and a cost per individual treated. The perspective of a BIA is from the budget holder – your social enterprise.

A BIA often accompanies a CEA. A CEA calculates an innovation's fundamental economic feasibility while a BIA assesses the affordability to the budget holder.

ersonnel

A point person capable of bookkeeping with a thorough understanding of your organization's accounting and functioning is important. Using an experienced accountant on staff would be appropriate and useful. S/he will need to be able to account the costs of implementing your innovation, but also account for the costs associated with the comparator (e.g., status quo).



You must be willing to invest the time of your dedicated staff person in gathering cost data on your interventions. It can be useful to collect these costs during annual budgeting, with attention paid to any long-term budget impacts (e.g., lower hospital readmission rates).



A BIA is generally not an expensive endeavor. The primary cost is staff time.



lesources

- Sullivan SD, et al. "Principles of good practice for budget impact analysis II: Report of the ISPOR Task Force on Good Research Practices – Budget Impact Analysis." Value in Health 17. 2014: 5-14
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FLOWCHART DESCRIPTION OF ECONOMIC ANALYSES

In many ways, the ideas behind the different types of economic analyses build off each other. Consider this flowchart as a way to visualize the relationships between the different types of economic analysis.

DIFFERENT TYPES OF COST ANALYSES IN HEALTHCARE

Cost Analysis

The most fundamental type of cost analysis, which takes into account the costs of implementing an intervention and the cost of the intervention itself.

In the analysis, add a comparator- an alternative product/ intervention with the same clinical outcomes as to your product/intervention- to compare costs

Cost-Minimization Analysis

Cost-minimisation analysis is an appropriate form of evaluation to use when there is reason to believe that the outcomes of the intervention under consideration are the same.

Now, instead of using an intervention with the same outcomes, use an intervention with different but documented outcomes as a comparator

Now, quantifying the outcomes of the intervention and alternative in monetary units



Cost-Consequence Analysis

Cost-consequence analysis assesses the different costs and benefits of an intervention separetely, as well as the costs and benefits of the control or alternative separetely. There are no assumptions that the alternative and the intervention yield the same clinical results. Now, quantifying the outcomes of the intervention and alternative in monetary units

Cost Benefit Analysis

Cost-benefit analysis is sometimes used loosely as a general term covering all types of economic evaluation, but among health economists the term is usually restricted to those forms of evaluation that are used to place a monetary value on benefits or outcomes, and comparisons made on monetary bases

Cost-Effectiveness Analysis

Cost-effectiveness analysis is used when the outcomes of different procedures or programmes being considered may be expected to vary, but these outcomes can nonetheless be expressed in common natural units (or an effectiveness unit). The costs (in \$) and benefits (in a natural unit) are then expressed as a ratio.

Use Quality Adjusted Life Years (QALY) as the effectiveness outcome measure



Cost-Utility Analysis

Identitical to a Cost-Effectiveness Analysis in measuring costs, and uses the principle of an effectivenss unit to ascertain outcome, but the effectiveness unit is standardized into Quality Adjusted Life Years (QALYs)

SECTION 4

Guidelines and Resources





Belt, Juan A.B.; Zuvekas, Clarence Jr. <u>Strengthening</u> <u>Cost-Benefit Analysis in USAID, 2011-2013: Lessons Learned</u> <u>and Future Directions.</u> (n.d.): n. pag. 11 Mar. 2014. Web.

Juan Belt is the Senior Economic Advisor for the Bureau of Economics, Education and Environment. Clarence Zuvekas, Jr. is an individual consultant. In this paper they describe the history of cost-benefit analysis (CBA) at USAID and how that has recently changed. They begin with a solid background of how CBA use was nearly eliminated in USAID projects/planning and how it is becoming a more common feature of project design since its use in the Feed the Future Initiative in 2011. This is a fairly detailed discussion of the use of CBAs as a planning/ pre-implementation tool, what its impacts are, how it is linked with monitoring and evaluation tools and scale-up, and how USAID has reincorporated it into their work. They also describe how and when it is worthwhile to conduct a CBA – namely when the CBA will have impacts on resource allocation, and the fact that it should be used as a pre-design informing tool. They end with case-studies of CBA use in several different countries, including a background of the particular project, how the CBA was used, the results and impact on resource allocation, and how to expand CBA to other sectors.



Drummond, M, O'Brien, B, Stoddart, G., Torrance, G. <u>Methods for the</u> <u>Economic Evaluation of Health</u> <u>Care Programmes.</u> Oxford Medical Publications. 2nd edition. 1997. Classic textbook on healthcare economic evaluations. Recommended by economists as one of the more useful applied references. The text outlines basic different types of economic evaluation: cost analysis, cost-effectiveness analysis, costutility analysis, and cost-benefit analysis. It also discusses how to collect, analyze, and present economic data Useful overall basic reference and helpful contextual healthcare information, particularly for those without an economic background.



Economic Evaluation: Guide to approaches for public health supply chains. DELIVER Project, Task Order 4. USAID. January 2014.

This guide was written as a part of USAID's DELIVER project to assist policymakers in better understanding the different types of economic evaluations and when each type is most useful. The context in which this guide is set is one of public health supply chains. The DELIVER Project was undertaken in order to strengthen these supply chains in developing countries. The main evaluation types covered in detail are cost-effectiveness and cost-benefit, which include examples of questions that each type can help answer as well as data requirements for conducting the analysis. Also included are helpful recommendations for obtaining and measuring certain costs and consequences for several inputs and outputs typically used in economic evaluations of health supply chains. This guide is useful for innovators working alongside or in conjunction with the public health sector, or who want to evaluate a supply chain of their own. It is particularly helpful for those who are unsure of which analysis approach to take as this guide takes under consideration several types of questions and outcomes that may be of interest in this context and highlights which analysis type is most useful for deriving answers.



Edejer, T. Tan-Torres; Baltussen, R.; Adam, T.; Hutubessy, R.; Acharya, A.; Evans, D.B.; and Murray, C.J.L. <u>Making</u> <u>choices in health: WHO guide to cost-</u> <u>effectiveness analysis.</u> World Health Organization. 2003.

As a collaboration of several experts in the field, these guidelines were written to better inform policy-makers and researchers of the concepts and methods of a generalized cost-effectiveness analysis (CEA). They provide an overview of what a CEA is, how it is used, as well as directions for estimating different costs and the effectiveness of interventions/ programs specific to a health context. Because they were written for a non-technical audience, there are several examples of what types of costs are useful and how to actually calculate them in different scenarios. Included as well are nine background papers and applications of CEAs that have been undertaken. These provide further guidance and highlight limitations and logistical concerns to keep in mind when conducting a CEA. This set of guidelines is particularly useful for investigators who perhaps have limited experience with economic concepts such as discounting, exchange rates, etc. and who need a more detailed explanation of how to estimate the components of a CEA.

Expanding and Simplifying Treatment for Pregnant Women Living with HIV: Managing the Transition to Option B/B+. Ch 6: Costing Tool (n.d.): 94-103. IATT. The Interagency Task Team in the Prevention and Treatment of HIV Infection in Pregnant Women, Mothers and Children, May 2015. Web. Oct. 2015.

The Interagency Task Team (IATT) was founded in 1998 and made up of UN agencies (UNAIDS, UNICEF, UNFPA) and the WHO, in an effort to prevent HIV transmission from mother to child. The Option B/B+ Toolkit describes key considerations to make when transitioning from one program option to another (namely to Options B/ B+), and the necessary assessment tools and checklists. The sixth module focuses on the costing tool, and evaluates some of the operational costs involved in the switch as well as the scope and limitations of cost modeling in a country-specific context. It outlines key components that should be evaluated when considering the switch to Options B/B+, describes certain cost factors to keep in mind, and explains important distinctions between costing and budgeting that are relevant to this context. The module also briefly describes four publicly available models that can be effectively used to for this purpose. This is helpful to us in that it describes certain aspects of operation costs to keep in mind. The four models of cost-evaluation might also be useful in developing our tool and comparing it to existing resources.





Haute Authorite de Sante. <u>A Methodological Guide:</u> Choices in Methods of Economic Evaluation. 2012

This guide covers in detail the recommended economic evaluation methods of Haute Authorite de Sante (HAS). These methods are specific to the context of health interventions and are therefore helpful to innovators in the broader field of health, whether they serve facilities or consumers directly. The guide describes several of the main types of economic evaluations, when and how they are used, and from what perspective they should be considered. It is organized in a way that breaks down an analysis from the early stages of deciding which type of analysis to utilize, to understanding what data is necessary and how to assign measurements, to interpreting the results of the analysis. This is particularly helpful for innovators who want a better understanding of how to measure and properly assign weight to the data they will collect.



Levin, Carol. <u>Economic</u> <u>Evaluation for Global</u> Health Programs. A useful, short brief by a global health economist and professor at University of Washington. Great short, easy read on what an economic evaluation is, why conduct an economic evaluation, the types of evaluations (cost-effectiveness, cost-benefit, cost-utility, and cost analysis). She outlines specific steps to take in how to construct an evaluation, how to collect data, and important analysis steps. She offers suggestions on how to reduce cost, time, and burden of data collection for those implementing projects or work in the field. List of references at the end is broad and helpful, and listed out by health content area (e.g., HIV/AIDS, diarrhoeal diseases). She also lists a few short courses (1day to 1-month) on health economics.



Wilkinson, Tommy; Chalkidou, Kalipso; Walker, Damian; Lopert, Ruth. <u>Methods for</u> <u>Economic Evaluation Project: Final Project.</u> Bill and Melinda Gates Foundation. NICE International. January 2014.

The Methods for Economic Evaluation Project (MEEP) provides a deeper understanding of the methodologies used in different types of economic analyses and discusses the use of reference cases as a foundation for conducting an analysis. There are four main sections of the report. The first provides a background for economic evaluations in low- and middle-income countries of projects/programs related to HIV/AIDS, malaria, TB, and vaccines. It outlines a review of several different types of evaluations that had been funded by the Bill and Melinda Gates Foundation (BGMF). The second is a broader discussion of methodologies typically used in low- and middle-income countries and the benefits and limitations of using a reference case for economic evaluations. The third places these methodologies in a contextual setting with a reference case and walks through an analysis. Finally, the fourth provides the reader with further recommendations from the Bill and Melinda Gates Foundation for conducting a quality economic analysis. This is helpful to investigators who want a brief overview of different types of economic analyses and how they are used, as well as whether a reference case would be a helpful tool given their circumstances.



<u>Costing Tools.</u> The Partnership for Maternal, Newborn, and Child Health. World Health Organization. <u>http://www.who.int/pmnch/</u> <u>knowledge/publications/costing_tools/en/</u>

Beginning in 1998, the CHOICE project was designed to inform policy decisions on interventions and programs related to health. Its purpose has been to measure and report value and efficiency of such interventions and programs. This set of tools and guides is useful to innovators considering a cost-effectiveness analysis (CEA). It includes their methodology, a link to their CEA guide (see Edejer et al reference above), how to estimate costs as well as common units of measurement, and country contextualization templates to use or build on.



<u>Cost Effectiveness and Strategic Planning</u> (<u>CHOICE</u>). World Health Organization. http://www.who.int/choice/en/

The WHO, in collaboration with several international development partners, has selected and reviewed thirteen costing tools that are relevant to maternal, newborn, and child health (MNCH) interventions and programs. The site includes detailed descriptions and examples of the thirteen tools, and an interactive guide to selecting a tool. Included among the set of are costing/financing tools for immunization, healthcare technology, as well as a planning and budgeting framework. While not designated to a specific type of analysis, this is highly useful for innovators seeking guidance on how to cost different components of their product and/or service.



Chandler, Rudolf. <u>Costing and Budgeting Tools</u> <u>at the Decentralized Level: State of the Art.</u> USAID. 2011.

This is a more condensed overview of the Partnership for Maternal, Newborn, and Child Health's (PMNCH) site. It outlines what is available, provides examples, and discusses the broader challenges and limitations of costing and budgeting. This presentation is a helpful first-step in understanding what is in the PMNCH site and how to navigate it.



Paxton, Alexander; Carvalho, Nadia. <u>HIV/AIDS</u> <u>Program Costing Tools: Concepts and Methods</u> <u>Used under the USAID</u>. Health Policy Initiative, Costing Task Order. USAID. 2013.

Set in the context of HIV/AIDS interventions and programs, this guide describes the tools and methodologies used for costing that have been developed by USAID. Among the costing tools included are an impact model for business, a product unit costing spreadsheet, a service delivery costing model, as well as a resource needs model. This is a useful resource for innovators seeking a costing model for similar products or services.



Asian Development Bank. Cost-Benefit Analysis for Development: A Practical Guide. Asian Development Bank. 2013.



Sullivan SD, Mauskopf JA, Augustovski F, et al. <u>Principles of good practice for</u> <u>budget impact analysis II: Report of</u> <u>the ISPOR Task Force on Good Research</u> <u>Practices – Budget Impact Analysis.</u> Value Health 2014:17:5-14

This resource, released by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), provides up-to-date guidance for undertaking and reviewing budget-impact analyses (BIA). For the sake of standardization of BIAs, the document provides a recommended framework, guidance on use of data, and a common reporting format.



Garatini, L & van de Vooren, K. <u>Budget</u> <u>impact analysis in economic evaluation:</u> <u>Proposal for a clearer definition.</u> The European Journal of Health Economics. 12(6), 499. (2011).

This is a literature review which explores the current methodologies and definitions of budget-impact analysis (BIA). In response to recommendations found in the literature, the authors propose a step-by-step definition of BIA in contrast to cost-effective analysis.

Photo credit: MicroClinic Technologies



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The Duke Global Health Institute Evidence Lab conducts objective and high-quality evaluations using rigorous and innovative research designs paired with cutting-edge methods. Our team blends theory and practice, and draws upon the research and policy expertise across Duke University to inform our evaluations and to disseminate new evidence to policymakers and diverse stakeholders. We have deep, on-theground knowledge and experience with a wide range of global health projects and offer research and practice-based understandings of regional health challenges.

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