



# Considerations for assessing the economic value of population health interventions

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## Introduction

There are few resources available that discuss the relevance and appropriateness of various approaches to economic assessment for population health interventions, or provide guidance on their selection and use.

This reflection paper provides an approach to the economic assessment of population health interventions. It is based on a targeted review of the literature that focused particularly on approaches used in the field of obesity prevention and mental health promotion. The paper is also based on interviews with leading Canadian and international experts in health economics and in specific approaches such as social return on investment (SROI). Finally, the paper draws on SRDC's own extensive experience conducting economic assessment of interventions in a variety of social policy domains, using many of the approaches described in subsequent sections.

Rather than a how-to guide for conducting economic assessment, this paper describes a number of important factors that should be considered, whether prior to conducting an economic assessment (e.g., deciding which approach to use), mid-course (e.g., assessing whether the assessment is on track), or afterwards (e.g., assessing if it achieved its purpose and how to use its results).

## Overview

In its simplest terms, economic assessment is a way to determine the economic value of an intervention in terms of its costs and benefits. The paper begins with a brief overview of both economic assessment and population health intervention, in order to understand some of the challenges and benefits of this work.

## Population health interventions

Population health interventions focus on health equity and the social determinants of health, with the implication that even interventions conducted *outside* the health sector can nevertheless influence health outcomes and redress structural inequities among sub-groups of the population. As a consequence, the effectiveness of these interventions is established not only through changes in health conditions and corresponding risks, but also through their ability to “build the individual, the family, the community and society more generally.”<sup>1</sup>

Accordingly, evaluation of population health interventions should focus not only on health or health-related outcomes such as changes in knowledge and attitudes, stigma reduction, behaviour changes, and morbidity rates. Ideally, they would also focus *on the capacity of people and organizations to act*, such as through inter-sectoral collaboration, community engagement, and partnership formation.<sup>2</sup>

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<sup>1</sup> de Salazar, Díaz, & Magaña, 2002, cited in de Salazar, Jackson, Shiell, and Rice, 2007, p. 8.

<sup>2</sup> de Salazar et al., 2007.

Population health interventions are also *complicated interventions* that act within *complex systems* such as education, employment, and social services. A complex system has three primary characteristics: 1) it is adaptive to changes in its local environment, 2) it is composed of other complex systems, and 3) it behaves in a non-linear fashion. In other words, changes in outcomes may not be proportional to changes in outputs, but rather, often involve “tipping points” that lead to legislative and policy changes as well as changes in societal norms (e.g., attitudes towards smoking in public spaces).<sup>3</sup> Again, evaluation of population health interventions that aim for such changes would ideally keep such tipping points in mind when looking to explain influence, cause and effect.

## Economic assessment

The economic assessment of population health interventions is the systematic evaluation of the costs and benefits of an initiative or program to determine its value and relative economic efficiency. This information helps inform decisions about the program itself and potentially, about the allocation of finite resources within the broader health system.<sup>4</sup> Economic assessment of population health projects is intended to measure the value for money of a project so that health and social programs can have the highest impact for the lowest cost.

A fundamental part of the study of population health is “estimation of the cross-sectoral cost-effectiveness of different types and combinations of investments for producing health.”<sup>5</sup> In fact, improvements in population health require cooperation from multiple actors – including legislators, researchers, academics, funding bodies, and service providers – in various fields, who share their respective knowledge and experience to achieve similar outcomes.<sup>6</sup> Understanding which programs can meet those outcomes through the most efficient allocation of resources can help improve overall program delivery within the health system and potentially, within other systems or sectors as well.

However, economic assessment is only one of many factors that must be considered when allocating financial resources to population health interventions, and this type of evaluation does not supersede the primary goal of protecting and improving health.<sup>7</sup> Economic assessment can improve evidence-based decision-making by allowing those working in public health to “identify, measure, and compare activities with the necessary impact, scalability, and sustainability to optimize population health.”<sup>8</sup>

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<sup>3</sup> Shiell, Hawe, and Gold, 2008.

<sup>4</sup> PHAC, 2014. See also Chisholm and Evans, 2007; Rabarison, Bish, Massoudi, and Giles, 2015.

<sup>5</sup> Kindig and Stoddart, 2003, p. 381.

<sup>6</sup> Ibid.

<sup>7</sup> PHAC, 2014.

<sup>8</sup> Rabarison, Bish, Massoudi, and Giles, 2015, p. 2.

## Challenges of economic assessment of population health interventions

The complex, holistic nature of population health interventions creates several methodological challenges to their economic assessment,<sup>9</sup> particularly in terms of a) measuring impacts, and b) valuing health outcomes,<sup>10</sup> as well as c) overall scope.

- a. The challenge of **measuring impacts** relates in part to the difficulty of estimating how behaviours change over time. For instance, how might a short-term food skills intervention influence or change an individual's eating behaviour in the long-term? Moreover, how can we reliably estimate what would have happened in the absence of the intervention (i.e., the counterfactual), such as with health promotion and prevention programs? Finally, how can we properly and confidently attribute the effects of this or other interventions that target broad social issues affected by a number of known and unknown factors, and especially for community-level outcomes?

The more rigorous the methodology used to evaluate an intervention's outcomes – that is, the extent to which it minimizes threats to validity and reliability through strong research designs and methods – the more feasible it is to produce unbiased estimates of those outcomes. Including a comparison or control group permits estimation of impacts, and in turn, helps to address the question of attribution.

The most unbiased estimates of impact are derived from use of random assignment of participants to either the intervention (treatment) or a control group for comparison of outcomes. However, random assignment is often not feasible in the evaluation of population health interventions, so other means of identifying a counterfactual (e.g., through the use of quasi-experiments or natural experiments) and determining attribution (e.g., through contribution analysis) are required.

- b. The challenges of **valuing health and social outcomes** vary with the chosen methodology for economic assessment, but common to all is the challenge of assigning monetary values to health outcomes that may be subjective, qualitative, and/or intangible. Moreover, these outcomes may have different perceived benefits to different parts or stakeholders in the health system.
- c. The challenge of **defining scope** is common to all assessment or evaluation activities, and program managers<sup>11</sup> must determine what is most feasible, and of greatest relevance and utility to their organization. In economic assessment, scope entails the extent to which a) program benefits are considered as well as costs, b) other options or alternatives to the program are considered, c) a broad range of outcomes (and their duration) are included, and d) the range of perspectives or beneficiaries included.

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<sup>9</sup> Edwards, Charles, and Williams, 2013.

<sup>10</sup> Marsh, Phillips, Fordham, Bertranou, and Hale, 2012.

<sup>11</sup> For simplicity, we use "program" to refer to both project- and program-level interventions in the remainder of this paper. Likewise, "manager" refers equally to project and program staff.

Since population health interventions are by definition both complicated and complex – involving multiple components across multiple sites, engaging multiple stakeholders and/or sectors, and acting on multiple determinants of health – the scope of their economic assessment must necessarily be broad, even as this poses challenges in terms of resources and capacity.

## Benefits of economic assessment of population health interventions

Despite the challenges identified above, there is a growing need to justify the economic value of interventions funded by the public sector.<sup>12</sup> Programs are increasingly required to demonstrate they can achieve the greatest possible impact at the lowest cost. Economic assessments help provide this crucial information to a number of concerned parties, including project/program staff, funders, clients, and external stakeholders.

In fact, there are a number of benefits of conducting economic assessments of public and population health interventions, including:

- **Creating a culture of accountability and transparency:** By demonstrating a willingness to be open and transparent about how they spend program money, program managers can help foster a culture of accountability and transparency, which builds trust with their funding partners.
- **Extending the value of evaluation:** Program evaluations provide an opportunity for managers to assess the performance and outcomes of their intervention, ideally in comparison to a counterfactual (e.g., a comparison or control group) that indicates what would have happened in the absence of the intervention; doing so permits estimation of impacts. Economic assessments build on the strength of program evaluations. Many (though not all) approaches to economic assessment allow managers to assess the impact they believe the intervention would have in the community against its actual impact, and the resources required to achieve this.
- **Identifying activities of greatest importance:** An economic assessment can help identify which program activities are the most economically efficient, in other words, those that require the least amount of resources to achieve their desired outcomes.
- **Monitoring progress:** An economic assessment can also provide managers with the tools to monitor program performance and identify areas for improvement. Through the evaluation process, managers identify a baseline measure of program costs for delivery, set targets, work towards more efficient delivery of program activities, and measure their success over the long term.
- **Using a common language:** Economic assessment provides an additional tool to program managers to “sell” the benefits of their interventions to audiences with more of an economic or business orientation than those in social or health program delivery. In order to attract private sector funders, for instance, program managers may find greater success with economic

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<sup>12</sup> Tchouaket and Brousselle, 2013; Edwards, Charles, and Williams, 2013.

terminology and arguments such as *return on investment* when communicating the value of their interventions.



# The fundamentals of economic assessment

## Definitions

There are essentially two broad types of economic assessment:

- **Partial** economic assessment, which simply measures the costs of a program or the costs of an illness, but does not involve a counterfactual (i.e., what would have happened in the absence of the program) or alternatives, and does not link costs to outcomes;
- **Full** economic assessment (also known as economic evaluation), which systematically assesses both the costs and outcomes of an intervention and determines its relative economic efficiency in relation to one or more alternatives.<sup>13</sup>

This is an oversimplification, of course, since there are in fact several dimensions to economic assessment, as outlined further below. These dimensions imply more nuance than the simple partial/full typology identified here, and could help inform the choice of assessment approach.

Which costs are counted, valued, and included in an economic assessment often depends on the approach selected, the availability of data, and the overall purpose of the assessment. In its 2010 review of economic evaluation, the Public Health Agency of Canada<sup>14</sup> identified three types of costs that are typically considered in the evaluation of public and population health programs. The following list is adapted from this review.

- **Direct costs:** Direct costs are the simplest to measure. They refer to the cost of goods and services for which payment was made in the context of a program's activities (e.g., salaries of program staff, materials that were purchased for use by program participants).
- **Indirect costs:** In contrast to direct costs, indirect costs are not attributable to any direct program expenditure. Instead, indirect costs can be understood as the negative economic impact of an illness on an individual, organization, or society. Typically, indirect costs are measured in the following ways:
  - a. **Lost potential income**, which represents income that was not earned due to a person's absence from work because of an illness or premature death;
  - b. **Economic underperformance**, such as presenteeism, whereby a person's illness or disability affects their performance while at work;
  - c. **Lost non-market production**, such as care-giving or unpaid work due to illness or disability; and
  - d. **Time lost from work and leisure activities** by family members or friends who are required to provide care to ill persons.

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<sup>13</sup> Rabarison, Bish, Massoudi, and Giles, 2015.

<sup>14</sup> Ball, DesMeules, Kwan, Jacobsen, Luo, and Jackson, 2009.

- **Intangible costs:** Intangible costs are the most difficult to measure and, consequently, the most difficult to monetize. They refer to the subjective consequences associated with an illness, such as physical pain, mental anguish, anxiety, stress in personal relationships, loss of good health or independence, fear, and negative impacts on family life.

The *benefits* of an intervention can be thought of in similar terms, and when measured, be assigned a monetary or economic value.

- **Direct benefits:** Direct benefits are the concrete and tangible, positive outcomes that stem directly from participation in the activities of a treatment or intervention (usually in the short-term). These could include reductions in the number of sick days or number of people infected, reduced mortality, increased service usage, etc.;
- **Indirect benefits:** These are likewise benefits of an intervention, but accrue from its positive economic impact on an individual, organization, or society. Indirect benefits could include productivity gains (e.g., from reduced sick leave), reduced costs (e.g., lower medical bills, fewer disability claims), or efficiency gains (e.g., from e-health interventions);
- **Intangible benefits:** Like intangible costs, intangible benefits are the most difficult to measure and monetize. They refer to the subjective consequences associated with health, either in terms of the absence or treatment of illness, or more broadly with health and wellbeing. Examples include client or patient satisfaction (e.g., with services), quality of life, absence of pain or reduction of symptoms, decreased stress, health literacy, personal empowerment, engagement in decision-making, and social inclusion.

The extent to which these different costs and benefits are taken into account varies considerably in the approaches to economic assessment described below.

## Methods for economic assessment<sup>15</sup>

- **Cost-of-illness analysis (CIA)** estimates the total costs or economic burden of a disease or condition. This method answers the question, ‘what are the costs of treatments and preventative measures for a given illness?’ In terms of obesity prevention, for example, a CIA would provide information on the economic costs of obesity for society, to determine what are the costs of obesity and how much is spent on treating or preventing obesity.
- **Program cost analysis (PCA)** consists of a systematic collection and breakdown of a program’s costs, describing how, by whom, for what purpose costs were incurred. A PCA provides an overview of the costs of a program without considering whether or not its intended outcomes were achieved. In this way, it is considered the most basic method of economic assessment, and is not considered a full economic evaluation per se.

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<sup>15</sup> All definitions in this section are from Rabarison, Bish, Massoudi, and Giles, 2015 unless otherwise noted.

- **Cost-minimization analysis (CMA)** is an extension of a Program Cost Analysis in that it is only concerned with program costs, not its benefits.<sup>16</sup> A CMA compares the costs of different program or policy options, and ranks them accordingly, with the least costly option considered the most efficient. This approach is only feasible if the expected outcomes, direct and indirect benefits of all options are the same and the only variable is cost, an assumption that is very difficult to prove.
- **Cost-effectiveness analysis (CEA)** is used to compare the relationship between the costs of a program and its health outcomes. Unlike CBA, which monetizes outcomes in order to compare costs and benefits in constant units (usually dollars), CEA compares costs with the outcome units of a given program, such as life-years saved or number of cases averted, generating a Cost-effectiveness ratio (CER). CEA is useful for identifying the most cost-effective option when comparing a number of different initiatives that address the same health outcome.<sup>17</sup>
- **Cost-utility analysis (CUA)** is a special form of CEA where the costs and benefits of a health intervention are expressed as the cost per a standardized morbidity and mortality measure, such as quality-adjusted life-year (QALY) or disability-adjusted life year (DALY), with the result typically expressed as cost per QALY. A CUA is usually conducted to decide among multiple public health interventions with different costs and outcomes, with the lowest cost per QALY deemed to be the most cost efficient option.<sup>18</sup>
- **Cost-benefit analysis (CBA)** is the most commonly used and widely accepted economic assessment methodology. Considered the “gold-standard,” a CBA assesses all costs and outcomes of a given program and converts them into comparable units such as dollars or dollars per unit. Moreover, a CBA compares a program with possible alternatives to determine which scenario provides the greatest benefit at the lowest cost. A benefit-cost ratio (BCR) is a common summary measure that expresses results of CBA as a ratio of net benefits to direct costs. For instance, a 2:1 BCR means that for every \$1 in direct costs one can expect \$2 in net benefits in return.
- **Social return on investment (SROI)** is a relatively new approach to economic assessment, founded on the principles of CBA.<sup>19</sup> SROI is intended to measure the social, environmental and economic value – the “triple bottom line”<sup>20</sup> – created by an organisation or program, and uses blended value accounting<sup>21</sup> to develop a holistic measure (rather than separate and competing measures) of these various outcomes. Like CBA and SCBA, SROI assigns a monetary value to intangible social and environmental outcomes; unlike other methods, SROI engages program

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<sup>16</sup> National Collaborating Centre for Healthy Public Policy (NCCCHPP), 2014.

<sup>17</sup> Murray, Evans, Acharya, and Baltussen, 2003.

<sup>18</sup> Rabarison, Bish, Massoudi, and Giles, 2015.

<sup>19</sup> New Philanthropy Capital, 2010.

<sup>20</sup> Millar and Hall, 2012; see also Banke-Thomas et al., 2015, p. 3.

<sup>21</sup> Nicholls, 2009.

stakeholders to a significant degree in identifying priority outcomes and determining their value.<sup>22</sup>

Similar to CBA, SROI produces a financial ratio with the numerator serving as the total value of the intervention's social benefit and the denominator, its costs. One of the main distinctions between the CBA and the SROI ratios is that SROI represents the social value, not just the financial value of the services provided. In this instance, the SROI ratio "represents the social value created for each [dollar] invested. This is how much stakeholders (including beneficiaries, the government, the employees of the [organisation]) value the service. It does not represent an actual financial return."<sup>23</sup>

### Box 1      The evolution and popularity of SROI

The non-profit sector has been an early adopter of SROI. In fact, non-profit organisations that have used SROI see the method as an additional tool to help them demonstrate the social impact of their services to stakeholders and investors. SROI focuses particularly on "identifying and appreciating value created" and on assigning value to intangible social and environmental benefits that are not easily quantifiable, are not usually monetized, or are not often considered in measures of success. Additionally, SROI allows organisations to communicate the value of their services in an economic language that funders will understand. In an example from New Philanthropy Capital's position paper on SROI, we can see how SROI can approaches the value of non-financial benefits:

"Giving £100 to a lonely pensioner might improve their life in the very short term; they could use the money to pay for services or buy goods or might just appreciate the extra financial security it gives them. But giving £100 to a charity that runs social activities for pensioners might help that person to form and maintain lasting friendships."

- **Social cost-benefit analysis (SCBA)**<sup>24</sup> was developed in the 60's in the context of urban infrastructure development, as a means of capturing both financial as well as social effects such as on the environment (e.g., pollution, habitat destruction), public safety, and local labour markets, to understand "the net benefits to the human condition."<sup>25</sup> More recently it has been applied in the context of skills training, employment programming, and community development policies.<sup>26</sup> Social CBA is a broader, more integrative form of CBA that includes and monetizes (or at least quantifies) the full range of relevant costs and benefits – including intangibles – to the greatest extent possible.

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<sup>22</sup> Millar and Hall, 2012.

<sup>23</sup> Heady, 2010, p. 4.

<sup>24</sup> This definition stems largely from Cameron, 2011.

<sup>25</sup> Cameron, 2011, p. 201.

<sup>26</sup> Gyarmati et al., 2007, 2008, and 2014.

Like SROI, SCBA produces an estimate of the social value of an intervention as well as its economic value. Unlike SROI or traditional CBA, however, SCBA also considers the *distribution* of costs and benefits across different population sub-groups, and so is able to explicitly incorporate equity concerns into its underlying assumptions and judgements. A full SCBA can also compare program alternatives that take different economic risks and uncertainties into account, providing decision-makers with choices and options.

This broader scope and often the scale of the interventions (and their associated evaluations) affords the SCBA method more powerful attribution and valuation models (such as random assignment designs with regression-based wellbeing valuation) leading to more robust results than any of the other methods. At the same time its strength can be a limitation in that the full SCBA method is often not possible in some contexts.

- **Cost-consequence analysis (CCA)** is considered a secondary approach to economic assessment since it combines a number of measures into a single evaluation, while keeping each one separate. The CBA, CEA and CUA each produce a single measure of efficiency (such as QALYs, cost-benefit ratios, cost-effectiveness ratios, etc.), which are then incorporated into the same table, or balance sheet. For example, an evaluation of a social housing program may include changes to homelessness rates, changes to child poverty rates, changes in QALYs, cost per housing unit, cost per 1000 population and so on.<sup>27</sup>

The main methodological issue with this approach is that there is no indication of how each measure within the balance sheet is or should be weighed against each other.<sup>28</sup>

Notwithstanding this concern, the National Institute for Health and Clinical Excellence (NICE) in the UK has advocated for this option in its health methods guidelines.

Rather than explore each of these approaches to economic assessment in depth, the remainder of this paper focuses on a subset, namely, Program Cost Analysis, Cost-effectiveness Analysis, Cost-Benefit Analysis, Social Return on Investment, and Social Cost-Benefit Analysis. These five were selected based on their particular relevance for population health interventions and our understanding of the needs of those who implement them.

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<sup>27</sup> Ibid, p. 12.

<sup>28</sup> Marsh, Phillips, Frodham, Bertanou, and Hale, 2012.

## Box 2 What's different about SROI?

Some researchers have argued that the differences between traditional cost-benefit analysis and SROI are actually superficial rather than substantial, and that these differences are mostly in their respective styles rather than their substance. There are nevertheless important distinctions:

- SROI relies heavily on stakeholder engagement to identify outcomes of greatest priority and to assess their value. It is important to note that the focus on stakeholder consultation is not unique to SROI. In fact, CBA guidelines by Canada's Treasury Board clearly states that "extensive consultation with all Canadian stakeholders that will be impacted by the proposed regulation" may be required and that broad consultation can help identify the potential benefits of a policy. Nevertheless, economic evaluation methodologies do not explicitly require the engagement of stakeholders to the extent SROI does.
- Compared to other measures of economic efficiency, SROI is considered more of a performance management tool for organisations than an external evaluation of economic efficiency. As an internal assessment, SROI can help organisations link the costs of their activities to their outcomes and direct investments towards activities that have the highest social impact in order to improve overall performance.
- As a result, SROI guidelines do not recommend comparing SROI ratios across organizations, since "each SROI analysis is tailored to each organisation." In traditional economic evaluations, comparability is a useful aspect that can help identify efficient resource allocation. The SROI ratio is therefore most useful internally, as a benchmark within an organisation to measure changes in performance over time.
- SROI differs from other methods of economic assessment in embracing theory of change rather more explicitly, and allowing for the valuation of a broader range of outcomes. Like SCBA and in contrast to traditional financial and economic measures that focus on "the costs of services delivered by organizations, SROI allows those organizations to demonstrate the value they represent for communities".

## Dimensions of health economic assessment

The approaches to economic assessment presented above can be understood and differentiated on the basis of several dimensions. These dimensions speak directly to the three challenges identified earlier of assessing the economic value of population health interventions: defining scope, measuring impact, and valuing health outcomes.

**Scope** – Scope refers to the breadth of an economic assessment in terms of its goals, its time frame, and particularly, the nature of the outcomes included. At its most basic level, scope is determined by whether only costs are considered (as with Program Cost Analysis and its variants), or benefits as well (with all other economic evaluation methods), and by the duration for which these are considered (i.e., short- versus long-term).

However, scope is also determined by the extent to which the assessment considers both economic and social outcomes, as well as the inclusion if different outcomes based on the measurement options available e.g., direct, indirect, and or *intangible* costs and benefits. In this respect, CEA is more limited, since it focuses only on costs and generally, only direct measures of costs.

Finally, scope is also determined by the number of perspectives or beneficiaries included for whom economic value is generated (or costs incurred) – these could include individuals and organizations participating or exposed to the intervention, non-participants, governments, and/or society at large. In theory, CBA, and SCBA both include different levels of analysis in their assessments, though in practice, the number of perspectives is often limited by resource, capacity, and data constraints.

**Attribution** – Of all the challenges to measuring impact – particularly of population health and other complicated interventions – attribution is one of the most problematic. At the same time, attribution is key to economic assessment, insofar as it speaks to the ability to both detect that change has actually occurred, and to credit the intervention with whatever outcomes and benefits have been achieved. Without some kind of counterfactual (however imperfect), it is impossible to say with confidence that an intervention *generated* benefits and achieved a given return on investment.

In terms of attribution, SCBAs excel as they are often implemented in the context of an evaluation that includes a randomized control trial (RCT), the gold standard in facilitating attribution, or at very least a high-quality quasi-experimental method. In this respect, application of the SROI method is often lacking in quality attribution, given its narrower focus on single sites and its use as a performance management tool, as opposed to the goal of comparative policy analysis, as is the case with SCBA.

**Valuation** – This dimension refers to the methods used to articulate and measure the value of a given outcome or benefit. Methods such as CBA, SROI and SCBA all aim to place a value on a given outcome; the difference is in the process used. SROI and SCBA emerged out of criticism that, in focusing primarily on economic value, traditional CBA did not include or adequately value social outcomes that were of greater priority to program stakeholders (especially participants) than economic value. Accordingly, SROI places a high priority on stakeholder engagement to identify and value priority outcomes. The challenge, however, is in how context-specific this process is, which by necessity prohibits comparison across settings.

The following table summarizes the key features of each approach to economic assessment of population health interventions. Moreover, it positions them along the dimensions of scope, attribution and impact measurement, and valuation, as well other considerations, to aid managers in their selection.

**Table 1 Comparison of selected approaches**

	Program cost analysis (PCA)	Cost-effectiveness analysis (CEA)	Cost-benefit analysis (CBA)	Social return on investment (SROI)	Social cost-benefit analysis (SCBA)
<b>Goal/purpose</b>	Systematically accounts for all direct costs spent in program delivery. Doesn't link activities to outcomes, nor compare alternatives, but is foundational to all economic evaluations	Assesses program costs for given levels of outcomes; useful for comparing programs that have similar outcomes on the basis of their cost-effectiveness	Assesses whether the benefits of an intervention outweigh its costs by converting both into a comparable unit of analysis. Assesses economic return against comparable alternatives or the status quo	Assesses the social value of a program using similar valuation methodologies as CBA; emphasizes valuing intangible benefits	Assesses incremental social and economic value of an intervention, including intangibles. Analyzes distribution of costs and benefits with sub-group analyses
<b>Scope</b>	Limited	Moderate	Extensive	Extensive	Most extensive
<b>Impact measurement &amp; attribution</b>	Not applicable	Requires assessment of outcomes, not impacts	Requires impact assessment (counterfactual), though may have weak attribution when implemented in context of ongoing program evaluation	Requires impact assessment (counterfactual) though may have weak attribution when implemented in limited single-site settings as management tool	Requires impact assessment (counterfactual), generally the most robust method given data availability, often implemented as part of demonstration project
<b>Valuation methodologies</b>	<ul style="list-style-type: none"> <li>▪ Captures direct costs of program activities</li> <li>▪ Reported as costs in dollars</li> </ul>	<ul style="list-style-type: none"> <li>▪ Captures program outcomes</li> <li>▪ Reported in ratio of costs to natural program outcome units (e.g., life years saved)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Captures impacts (e.g., health and non-health)</li> <li>▪ Reported as monetary value or welfare benefit</li> <li>▪ List benefits that can't be monetized</li> </ul>	<ul style="list-style-type: none"> <li>▪ Captures impacts (social, economic and environmental)</li> <li>▪ Reported as monetary value or welfare benefit</li> <li>▪ Uses financial proxies to estimate benefits that cannot be easily monetized</li> </ul>	<ul style="list-style-type: none"> <li>▪ Captures impacts (social, economic and environmental)</li> <li>▪ Reported as monetary value or welfare benefit</li> <li>▪ Uses financial proxies and empirical methods to estimate benefits that cannot be easily monetized</li> </ul>



	Program cost analysis (PCA)	Cost-effectiveness analysis (CEA)	Cost-benefit analysis (CBA)	Social return on investment (SROI)	Social cost-benefit analysis (SCBA)
<b>Outputs</b>	Total costs and by category	Cost-effectiveness ratio	Cost-benefit ratio/economic Return on investment (ROI)	Social value/SROI	Economic and social value in separate and combined ROIs; often presented iteratively with economic ROI serving as benchmarks and social returns in extended ROI
<b>Interpretation of output</b>	Which program activities have the highest costs	Which program alternatives are most cost-effective	Benefit Cost Ratio>1 is worth the investment	SROI Ratio>1 is worth the investment	Benefit Cost Ratio>1 is worth the investment
<b>Relevance</b>	<ul style="list-style-type: none"> <li>Resource allocation</li> </ul>	<ul style="list-style-type: none"> <li>Resource allocation</li> <li>Comparison with alternative programs</li> </ul>	<ul style="list-style-type: none"> <li>Resource allocation</li> <li>Comparison with alternative programs or policy options</li> </ul>	<ul style="list-style-type: none"> <li>Resource allocation</li> <li>Stakeholder engagement</li> <li>Management tool</li> </ul>	<ul style="list-style-type: none"> <li>Resource allocation</li> <li>Comparison with alternative programs or policy options</li> </ul>
<b>Stakeholder involvement</b>	Not required	Not required	Not explicitly required, but recommended	Explicitly required	Not explicitly required, but recommended
<b>Resources required</b>	Modest	Moderate	Significant; requires specific expertise	Significant; requires specific expertise	Significant; requires specific expertise
<b>Level of application</b>	<ul style="list-style-type: none"> <li>Intervention</li> </ul>	<ul style="list-style-type: none"> <li>Intervention</li> <li>Organization</li> </ul>	<ul style="list-style-type: none"> <li>Intervention</li> <li>Organization</li> <li>Policy</li> </ul>	<ul style="list-style-type: none"> <li>Intervention</li> <li>Organization</li> <li>Policy</li> </ul>	<ul style="list-style-type: none"> <li>Intervention</li> <li>Organization</li> <li>Policy</li> </ul>
<b>Cross-site comparison</b>	No common unit for comparison	Yes, but qualified	Yes	Not recommended	Yes

**Source:** Adapted from Banke-Thomas et al., 2015.

# Considerations for economic assessment of population health interventions

There are a number of factors to be considered when selecting a specific approach to economic assessment. The following are what we consider to be key factors to guide reflection prior to embarking on economic assessment, to ensure the approach selected is the most appropriate one for a given program or organization. Likewise, reflection of these factors can be used to monitor economic assessment while in process (e.g., to minimize scope ‘creep’), and afterwards, to assess the results and plan next steps.

These factors are inherent in the following simple questions:

- What is the purpose of the economic assessment?
- What resources are available to conduct the economic assessment?
- What is the specific program context and how might this affect the economic assessment?
- How are outcomes and impacts of the program being assessed?
- How are intangible benefits of the program valued? Are there reasons why they should *not* be valued in financial terms?

The answers to these questions will determine the complexity of the approach that should be adopted in terms of scope, methodological rigour, and valuation techniques.

## Purpose

“Why are we conducting an economic evaluation of our program?”

Before deciding how to go about conducting an economic assessment, program managers need to ask themselves *why* it is being undertaken; indeed, this is one of the most important considerations. The result of an economic assessment should provide program managers with important and useful information about their intervention. While there may be several goals to assessment, managers should consider which of the following is the *primary* reason for proceeding:

- **Monitoring and Planning:** Which of our program activities provides the most efficient results? Are there any activities that are economically underperforming (i.e., consuming too many resources for little to no result)? Do we want to create a baseline measure of our activities in order to monitor outcomes over time?
- **Determining viable alternatives:** Is our program the most efficient intervention for achieving our stated outcomes? Are there alternatives that can achieve the same outcomes at a lower cost?

- **Being accountable to funding partners:** Do we need to justify our program's costs to external funders? Are they interested in whether or not we achieved our outcomes or are they simply interested in the cost of our activities?
- **Attracting future funders:** Are we attempting to convince external funders of the economic viability and efficiency of our intervention? Is there a certain language or a preferred evaluative approach that should be adopted to attract prospective funders?

Generally, the more an organization is focused on internal concerns such as performance monitoring, there is more tolerance for approaches with smaller scope, less rigour, and more context-specific valuation of outcomes. On the other hand, if comparisons are sought with program alternatives, or there is a need to justify decisions to, or otherwise address the concerns of external stakeholders, then a method with expanded scope, greater rigour, and more standardized approaches to valuation may be required.

### Box 3      A multi-purpose evaluation

An economic assessment can be undertaken for more than a single purpose. For example, a willingness to be transparent about a program's operating costs and being accountable could be attractive to prospective funders. Also, monitoring and evaluating program outcomes over time can help program managers have a better understanding of their program's impact, which in turn can help them communicate the value of that impact to potential funders.

Indeed, much has been written about SROI as a tool that can be used to retrospectively (what is the value of the impact already achieved) or for forecasting future returns on investment. In this sense, SROI can be used internally as a management tool and externally as a means of demonstrating the social value of an intervention. Nevertheless, it is crucial that the objective of the economic assessment be well defined prior to selecting an approach so that the resulting information be as useful as possible.

## Capacity

“Do we have the necessary resources to do this properly?”

For any economic assessment to succeed, program managers must honestly assess their organisation's capacity to engage in this work, and determine whether they can allocate sufficient resources to spend the time, cover the costs, and provide the staff required to complete the work.

- **Skilled resources:** Conducting an economic assessment requires expertise and experience that is quite different from that involved in service delivery.

In the absence of qualified internal evaluators, does your organisation have access to external staff to do the work or to provide training and ongoing support to employees who will take this on?

- **Access to information:** In order to measure a program's economic efficiency, program managers need to know the extent to which the program's activities achieved their outcomes, and with what costs.

Do you have access to evaluation results? Have you consulted with stakeholders or clients to understand what was achieved by your program? How much data on costs and benefits is available, and how credible is it? Are you able to monetise all costs, including intangible costs or benefits?

- **Accepting the costs:** Whether data collection is done by program staff or external evaluators, assessment activities will incur significant cost in addition to service delivery costs.

Has there been a thorough assessment of how much an economic assessment will cost? How many resources that would otherwise go towards program delivery are you willing to spend on an economic assessment? Is there funding available to cover the associated costs?

Not surprisingly, approaches to economic assessment such as Program cost analysis that are more limited in scope, rigour, and valuation methods, are more feasible for organizations with limited capacity than more sophisticated – and resource-intensive – economic evaluations.

#### **Box 4      Resources needed for SROI**

Between 2009 and 2012, Social Ventures Australia (SVA) conducted a series of SROI analyses with non-profit organisations. Following the assessment of each organisation, SVA emphasized the importance of establishing necessary processes to monitor progress over time. However, three years after the fact, most organisations had no mechanism in place to measure and evaluate their impact.

Researchers Miller and Hall (2012) summarised what appears to be a common challenge for non-profit organisations: that conducting a rigorous assessment and monitoring on-going progress — the necessary components of any economic assessment — takes time and money, resources that are rarely abundant. Organisations in the non-profit sector are often unwilling to transfer their finite resources away from service delivery and towards evaluation.

## **Context**

“How does our program context affect our economic assessment?”

An important starting point for any program manager is to understand the social, economic, political, historical, and environmental context in which their intervention operates. This is particularly true for population health interventions, which act on social determinants of health, address structural (and in some cases, historic) inequities, and take an ecological approach by addressing multiple contexts at once (e.g., individual, family, organizational, neighbourhood, community, society).

Understanding context means considering the unique or specific characteristics of the community in which the intervention is located, its target population, staff, sponsoring organization, and stakeholders, and how these characteristics may affect delivery and outcomes and vice versa. Of course, these are important factors when assessing the feasibility of replication and scale-up in general, but are critical to economic assessment to the extent they also influence program costs and benefits.

## Assessing impact

“How do we measure our program’s outcomes and impact?”

Perhaps the most crucial component of any economic assessment is a rigorous evaluation design. The quality and validity of an economic assessment depends entirely on the ability to systematically and reliably estimate a program’s outcomes and impacts. Despite the measurement and attribution challenges noted earlier, these should not dissuade program managers from attempting to do so.

There are still many ways to rigorously evaluate the effectiveness of population health interventions. Random assignment is often more feasible than people think, and even when this is not the case, other research designs (e.g., regression-discontinuity and other quasi-experimental designs, natural experiments) can still provide reliable, robust results. Using multiple data sources, collection methods, analytical techniques, and lines of inquiry can also help ‘boost’ the quality of evaluation results and hence, the precision of subsequent economic assessment.

The following are important steps in developing a full and objective understanding of program outcomes and impacts:

- **Design** – Does my organization have a solid understanding and agreement of the problem we are trying to address, and how our program aligns with best or promising practice in this field? Do we agree on why we expect our program’s activities to achieve the desired outcomes for participants (i.e., theory of change)? Can we show how our resources, activities, outputs, and outcomes inter-relate in a logical and coherent manner (as in a logic model)?
- **Implementation** – Is the program ready for outcomes evaluation? That is, have we learned enough from piloting and early implementation to finalize the program model/design and understand what the key elements or activities are, what quality looks like, and how much of the program is needed for participants to benefit? Has the program been in operation long enough to identify the most common implementation challenges and solutions, ideally, in different contexts? Do we understand how implementation of our program might affect our results?
- **Monitoring** – Do we have systems in place to track how clients/members/participants access, engage in, and move through our program? How much information do we have about who they are, how much they participate in or use our program, and what their experiences are?
- **Outcomes** – What are the indicators of success for our program, and how do we measure them? Do we have a way to balance perspectives in assessing our outcomes, so we achieve balance and minimize bias? How can we establish a counterfactual to help us distinguish between ‘gross

outcomes' (what our participants experience) and 'net impacts' (how participants would have fared in the absence of the program) so we can have a sense of the true impact of our program?<sup>29</sup>

### Box 5      Scoping the program and mapping out impact

Logic models and Theories of Change are basic tools for any good program evaluation, and foundational to the assumptions of economic assessment. For instance, SROI practitioners help program stakeholders develop an impact map, which is essentially an extended logic model that helps describe and visualise the value of the impact the program has on various stakeholders.

This step is part of a broader reflection that should occur during any evaluation, which includes a thorough review of the purpose and the scope of the program. An impact map also provides program staff with an opportunity to impart the knowledge and experience that has been gained about the situation or problem the program is addressing. The crucial element to any evaluation is to take stock of the program's activities, to identify the outcomes that should result from these activities, and to realise that some outcomes may not be measurable but should be explored qualitatively.

## Economic valuation of costs and benefits

In the case of SROI, CBA, or SCBA, investments and measured outcomes must be converted into comparable units (e.g., dollars or dollars per person). While direct and indirect costs can be assessed through their market or economic value, monetising intangible social impacts raises a number of issues, both practical and ethical.

### *How do we value intangibles?*

Intangible costs or benefits are the most difficult to value in monetary terms and as a result, are often excluded from economic assessment of population health interventions. Essentially, this step requires *attributing monetary value to a change in a non-monetary intangible*, often social outcome following a given intervention. Yet, by definition, you cannot buy or sell an intangible benefit; it is therefore void of any marketable value. As a result, economists rely on proxies and apply certain techniques to estimate them, such as:

- **Wellbeing valuation:** Through regression analysis using information from program participants or population-based datasets, researchers can assess the relationship between subjective wellbeing and income (i.e., for every unit increase in a person's wellbeing, what is the change in income?).

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<sup>29</sup> Bangser, 2014.

- **Compensating Differentials:** An extension to wellbeing valuation, compensating differentials utilizes the joint relationships between income, subjective wellbeing, and other social outcomes, to extend valuations to a wide range of intangible outcomes (Gyarmati et al., 2009).
- **Contingent valuation surveys:** Researchers ask participants to state how much they are willing to pay or how much they are willing to accept in order to keep or give up their current state of being.
- **Willingness to Pay:** An extension to contingent valuation surveys, this method involves the creation of scenarios in which participants are given *real-world* choices that elicit their preferences and “willingness to pay” for certain types of benefits and in different circumstances. This is an improvement over survey-based methods as it elicits true, or “revealed preferences”, as opposed to self-reported views on value (Palameta et al., 2014).

#### **Box 6      Monetizing intangibles with wellbeing valuation and compensating differentials**

Two successful applications of this approach to monetizing intangibles include the Community Employment Innovation Project (CEIP) and UPSKILL: Essentials to Excel, two recent Canadian demonstration projects (Gyarmati et al., 2008, 2014). Both interventions produced impacts on a number of social and intangible outcomes that were difficult to monetize. Beyond effects on health and mental health, this included changes in social networks, trust and cohesion in groups, as well as a range of psychosocial outcomes and measures of hardship.

The challenge for program practitioners and policymakers is that it can be difficult to interpret the relative value of these kinds of intangible impacts. Rather than provide qualitative interpretations alone, the methods of Wellbeing Valuation and Compensating Differentials were applied in both projects to provide at least some direction on the relative value of social impacts.

This approach uses an empirical model to place a dollar value on the impacts of the intervention on any intangible outcome. In addition to the intangible measure in question (e.g., increased social engagement), the approach requires data on both subjective wellbeing (such as life satisfaction) and a measure of income (such as personal or household income). The approach then involves regressions that measure the relationship between the intangible outcome of interest and life satisfaction, and then comparing this to the relationship between income and life satisfaction. The ratio of these coefficients – known as a compensating differential – expresses the dollar value of incremental changes in the intangible outcome. It can be interpreted as an “intrinsic” valuation of the outcome from the participant’s perspective.

In the case of CEIP, this methodology was applied to the positive impacts of the intervention on social capital, trust, and reductions in perceived hardship experienced by participants. The analysis demonstrated that the intrinsic value that participants placed on these gains were nearly equal in size to the economic gains they experienced in terms of employment and earnings (\$5,561), approximately doubling their overall net benefits (\$10,459).

In the case of UPSKILL, positive impacts from workplace essential skills training were observed across a range of psychosocial outcomes, and their intrinsic value to participants was even more important in this context. While the overall net benefits of UPSKILL for the average participant (\$828) was smaller than in CEIP (since it was a much

shorter intervention – 3 months versus 3 years), the relative value of their psychosocial gains was more than double (\$1,750). While one does not need to recalculate the ROI results to account for intangible effects (though one could) this does provide policymakers an additional piece of information – which helps to fully appreciate the degree of importance that participants implicitly place on social and intangible impacts.

### *Should we value intangibles?*

There are ethical issues that should be considered before assigning monetary value to benefits that are intrinsically invaluable.

- **Can a non-market good be assigned a monetary value?** One underlying interpretation made when assigning a monetary value to an invaluable good (such as a behaviour or a state of being) is that in a hypothetical market, we would be willing to pay a certain value to obtain a state of being or for a person's life.
- **How do culturally-specific understandings of value differ?** While the practical utility of assigning a monetary value to concepts such as health, quality of life, and subjective wellbeing may outweigh their intrinsic value, this is admittedly a Western perspective, and may be seen as inappropriate in some cultural contexts.
- **Are we introducing bias into our analysis?** By using unreliable methodologies, we risk over-estimating or under-estimating the value of intangibles and, consequently, introducing bias in the program's economic assessment. In any economic assessment, being accurate and transparent about assumptions and limitations is the most crucial element, far more than the ability to estimate all possible impacts.
- **Are we implying inappropriate "rankings" to intangible outcomes?** Valuation methods often lead to an implicit ranking of values of different intangible outcomes, which may not be appropriate in some contexts. While many of these methods indeed rely on individuals to implicitly value outcomes – implying their own relative ranking rather than some external weighting – considerable care needs to be taken not to assume these are relevant to other populations or contexts.



**Box 7      Is higher self-esteem worth \$200?**

On average, how much would someone be willing to pay to have higher self-esteem? This question may appear facetious – self-esteem is not something sold in any market – but for interventions working to improve healthy weights or promote mental health, improving a person's self-esteem may be an important non-market outcome. So, how can it be included in an economic evaluation?

Some health economists feel uncomfortable assigning a monetary value to an intangible benefit, and prefer to exclude these from their economic calculations altogether. Instead, they produce an accompanying discourse analysis, which serves to provide context for the program's return on investment (ROI). In so doing, the cost-benefit ratio or SROI ratio produced are purely economic in nature. While social value is considered, this is described qualitatively rather than included in the valuation, to minimize the risk of inappropriate comparisons.

Alternatively, SCBA integrates social and economic valuations but in an iterative fashion – whereby social benefits and costs are added to a “benchmark” model that contains only the economic outcomes. In this way, the social returns of an intervention can be “stacked” on economic returns. This provides an important basis for interpreting the *relative* contribution that social impacts can bring to economic ones without compromising the credibility or comparability of benchmark economic models.

## Discussion

The factors for consideration in the economic assessment of population health interventions identified in the previous section emphasize the need for reflection and preparation in determining which approach to adopt, how to monitor progress, and how to use the results. Selecting the right approach for an economic assessment is a crucial first step. In order to provide accurate and valid information about an intervention's costs and its benefits, organisations need to ensure they understand the purpose of their assessment, whether they have the capacity and evidence to conduct it, and how a specific approach aligns with their particular context and values.

The five approaches highlighted in this paper were selected to demonstrate that economic assessment begins with a simple analysis of program costs, and builds from there in terms of scope, attribution and impact measurement, and valuation techniques. More complex approaches, such as SROI, CBA, and SCBA, are an extension of this initial step, integrating outcome evaluation results and economic methodologies into their assessments. From this perspective, economic assessments can be understood as a step-wise approach, with each step incurring an additional level of complexity and rigour, moving increasingly towards pairing a program's costs with the value of its benefits.

- a. Cataloguing the program's costs;
- b. Evaluating the program's outcomes;
- c. Assessing the value of the program's impact;
- d. Comparing the program's economic value to alternative options.

One of the most important challenges that population health interventions face is in the evaluation of outcomes. Since many benefits that result from these interventions are difficult to measure, traditional economic evaluation approaches tend to discount many of the social benefits that make investing in these interventions worthwhile. As a result, SROI and SCBA have emerged in recent years as innovative and important alternatives to traditional approaches to economic assessment. By emphasizing a need to value social and intangible benefits – especially those valued by program stakeholders – these approaches can improve how we determine the value of interventions that have a broader social impact.

Nevertheless, SROI should not be perceived as an easier or simpler alternative to traditional approaches to economic assessment simply because it focuses on social value. In fact, an SROI requires knowledge of appropriate valuation methodologies and expertise in conducting program evaluation. For an SROI – or any other economic assessment approach – to be credible and to provide valuable advice to program managers, program funders, and other stakeholders, a rigorous research design is essential, coupled with strong valuation methodologies and transparency about assumptions and limitations.

## Conclusion

This document stemmed from a desire to support those implementing population health interventions to assess the cost implications and value of their interventions, as part of the process of decision-making about potential replication and scale-up. As outlined on the previous pages, there are a number of approaches to economic assessment that hold promise for population health interventions, particularly Program cost analysis, Cost-effectiveness analysis, SROI, Cost-benefit analysis, and Social cost-benefit analysis.

Each method has its strengths and limitations in terms of how well it addresses the three main challenges of scope, measurement and attribution of impacts, and valuing outcomes. CBA, SROI, and particularly, SCBA would seem to be the most appropriate in terms of the goals of population health intervention research, which seeks to understand the true impact of an intervention in relation to its context and to health inequities.

However, as the Considerations section makes clear, the most robust economic assessment makes little sense if it does not align with the program or organization's context, capacity, values, and purpose in undertaking it, or with the type and level of available evidence about the changes the intervention has produced. As with evaluation more generally, assembling evidence about the economic value of an intervention is a *process*, one that begins with a thorough understanding of related costs, then builds in scope to encompass benefits, intangibles, and their distribution across the range of program stakeholders. A thorough, credible program cost analysis may be the best approach to economic assessment for organizations that, on reflection of the key factors, determine this first step is most appropriate for them and their interventions.

The science of economic assessment of population health interventions is as yet under-developed. Until such time as the methodology, knowledge, and use of approaches such as SROI and SCBA for assessment of population health interventions becomes more sophisticated, their results should be interpreted with a high degree of both caution and attention to the specific context in which they were derived. Regardless of the approach used, rigorous evidence of program outcomes and transparency of assumptions and limitations remain the foundation of quality for economic assessment, and in turn, for their use in decision-making.

Even the most ambitious and comprehensive SCBA – or any other economic assessment – is only a tool to inform and support decision-making. Decisions about cost and value are still only one of many considerations for replication and scale-up,<sup>30</sup> and especially, for overall allocation of resources within the health sector. Of greater priority for policy-makers are considerations such as alignment with policy goals, broader evidence of effectiveness, sector capacity, and sustainability of impacts, among others.

Clearly, there is a need to develop capacity within the health sector for economic assessment as well as the evidence-base for different population health interventions. Private and public funders

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<sup>30</sup> Bangser, 2014.

have an important role to play in investing in the evidence- and capacity-building process, even as they balance this with the reality of limited resources. Fortunately, that investment can only help ensure that the population health interventions selected for replication, scale-up, and promotion are those that are most effective, equitable, appropriate, and needed.

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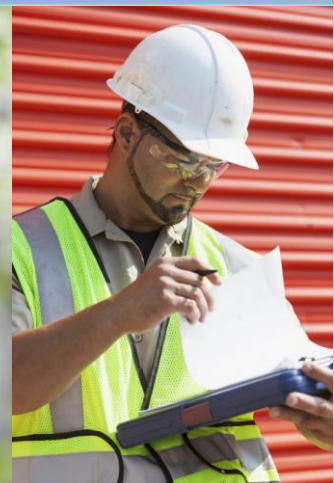
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