

Evidence and Evaluation Guidance Series
Population and Public Health Division

Planning economic evaluations: A checklist



Contents

Introduction to economic evaluation	4
Purpose of this checklist	4
Application of this checklist	5
Before you start this checklist	6
Completing this checklist	6
Checklist overview	7
Planning Economic Evaluations Checklist	8
References	16
Appendix A: Worked example of the Planning Economic Evaluations Checklist	17
Appendix B: Evaluation perspectives	20

Introduction to economic evaluation

Economic evaluation is a tool in which evidence about the costs and outcomes (outputs, impacts and/or benefits) of initiatives is gathered and compared to identify those that represent best value for money. Economic evaluations of health initiatives are designed to support resource allocation decisions. In relation to population health, economic evaluation can be used as one important source of evidence to compare two or more initiatives to determine the optimal investment to achieve a specific health outcome.

The basic tasks of any economic evaluation are to estimate the costs and outcomes of a proposed initiative against an alternative (a 'comparator'), which is typically a status quo or 'usual care' option. To inform decisions, economic evaluations must be rigorous, transparent regarding methods, and conducted ethically.¹ Confidence in adherence to such general principles enables policy makers to make greater use of evidence and promotes better decision making.²

Purpose of this checklist

The purpose of this checklist is to assist users across NSW Health to identify and consider all appropriate components when planning an economic evaluation. Once completed, users will have a clear outline of the parameters and requirements for their economic evaluation, which may be helpful when drafting project plans, project proposals, or documents to commission services for economic evaluations (e.g. Requests for Tender (RFTs), Requests for Quote (RFQs), Expressions of Interest (EOIs)).

This checklist is intended to increase both the methodological quality of economic evaluations and the transparency of how they are conducted in NSW Health.

This checklist can be used by people at all levels of experience and expertise in planning and conducting economic evaluations. It does not assume prior training in this field.

In addition, NSW Health offers a range of [resources](#) to support staff capability in economic evaluation.

This checklist should be read in conjunction with relevant NSW Government economic evaluation guidelines including:

- [NSW Government Guide to Cost-Benefit Analysis](#)
- [NSW Government Benefits Realisation Management Framework](#)

Application of this checklist

This checklist may be useful when planning or commissioning an economic evaluation or supporting the performance management of consultants throughout the evaluation process. It provides advice on each step of the economic evaluation planning process, practical questions to consider, and a worked example to demonstrate how each step can be carried out in practice. The checklist is geared to the NSW Health context and should be used in conjunction with the [NSW Health Guide to Commissioning Economic Evaluations](#)³ and the [NSW Health Guide to Commissioning Evaluation Services](#).⁴

Guidance is provided on the key issues that need to be considered when planning an economic evaluation:

- selecting a perspective and time horizon (or time frame) for the economic evaluation
- identifying an appropriate economic evaluation method
- identifying costs and outcomes to be measured and valued
- assessing whether forecasting and application of a discount rate are required
- incorporating methods into the evaluation to address uncertainty.

If you are seeking guidance on how to **review** an economic evaluation, you may wish to use the [Reviewing Economic Evaluations Checklist](#).

There are a number of core principles that underpin economic evaluation and this checklist is benchmarked against standard principles for conducting economic evaluations in the health context.⁵⁻⁹ In practice, there is no one 'correct' way to conduct an economic evaluation, nor is there necessarily one 'correct' decision on the methods selected for an evaluation.

A note about economic evaluations in population health

Population health initiatives can incur costs and outcomes that are broad-ranging, long term and impact at an individual and community level.^{10,11} While not unique to population health settings, these characteristics are often at the forefront of population health programs and pose particular challenges for economic evaluations. For example, to take into account population health outcomes that may only be realised many years into the future, economic evaluations may need to consider extrapolating costs and outcomes through forecasting and then adjust (or 'discount') the observed costs and outcomes to account for differential timing. Information on forecasting and discounting is available in [Steps 8 and 9](#) of this checklist.

In addition, equity is often an important consideration for population health programs. It may be relevant in some

circumstances to assess costs and outcomes according to different population subgroups. Information on subgroup analysis considerations is available in [Step 7](#) of this checklist.

Population health programs can also have an effect on outcomes that are not strictly health-related (e.g. a school-based health promotion program may impact upon students' school performance). They can also impact on multiple dimensions of health (e.g. a program designed to reduce domestic and family violence may lead to improvements in a range of physical and mental health outcomes).

To demonstrate the application of these principles in a population health context, a *worked example based on a published economic evaluation is provided in [Appendix A](#)*. This example is written from a planning point of view and is therefore presented as an economic evaluation to be conducted in the future.

Before you start this checklist

Before starting the planning process for an economic evaluation of your initiative, it is recommended that you complete the pre-evaluation assessment in Appendix 1 of the [NSW Health Guide to Commissioning Economic Evaluations](#). This will help you assess whether an economic evaluation is required, whether there are available resources/funds for an evaluation, and whether you have received the necessary approvals to proceed.

It is also recommended that you review the questions below before you start the checklist. These questions will help you ascertain whether there is merit in conducting an economic evaluation of the initiative.

If you respond 'No' to any of the below questions, consider undertaking the recommended actions that pop up before commencing the planning process.

Question	Answer
Do you have a program logic for the initiative that is the subject of the evaluation?	Yes No
Is there evidence of the initiative's effectiveness?	Yes No
Are there identified objectives for the initiative?	Yes No
Can relevant outcomes of the initiative be identified and measured?	Yes No
Has planning for the economic evaluation involved relevant stakeholders, and is there stakeholder buy-in to conduct an economic evaluation of the initiative?	Yes No

Completing this checklist

The checklist contains a series of steps to guide you in planning your economic evaluation. Explanatory text is provided with each step for further context. Questions for your further consideration and a section for you to mark your comments and planning decisions are available.

To save your inputs, download and save a copy of the PDF before you begin. Information entered directly into a web browser will not save.

To demonstrate the application of these principles, a *worked example of this checklist based on a published economic evaluation is provided in Appendix A*.

It may not be necessary in an economic evaluation to address all steps, depending on the type and purpose of the evaluation. The relevance of each step should be considered and agreed upon during the planning stage of the economic evaluation.

Checklist overview

1. Perspective
2. Comparator/s
3. Time horizon
4. Economic evaluation method
5. Costs
6. Outcomes
7. Subgroup analyses
8. Forecasting future costs and outcomes
9. Discounting
10. Sensitivity analyses
11. Statement of purpose

Planning Economic Evaluations Checklist

For more detailed explanation of terminology and concepts used in this checklist, refer to the [NSW Health Guide on Commissioning Economic Evaluations](#).

Step	Rationale
<p>1.</p> <p>Select a perspective for the evaluation*</p>	<p>The perspective of an economic evaluation is the point of view through which costs and outcomes are examined.</p> <p>The most comprehensive perspective is the societal perspective, where all relevant costs and outcomes are identified, measured and valued, regardless of where these costs and consequences fall. While it is ideal to take a societal perspective, collecting all the relevant information can be costly and time-consuming in practice. Other perspectives include those of an individual payer, the health sector, or the target group for a specific initiative.[†]</p> <p>The most commonly used perspective for health initiatives is that of the health sector (also known as the health system or health funder perspective). This perspective includes costs borne by the health system and outcomes expressed in terms of health gain (noting that health gain can also be considered an outcome from the societal perspective given the benefits to society).</p> <p>The decision regarding perspective depends on the underlying policy or investment decision that the economic evaluation is aiming to address. If the purpose of the economic evaluation is to inform a Ministry of Health decision to fund an initiative, then taking a health system perspective may be appropriate. If the purpose is to inform a NSW Treasury decision to fund a program which has potential health and other social impacts, a societal perspective may be more relevant. An economic evaluation may consider and compare multiple perspectives if warranted.</p> <p>Consider:</p> <ul style="list-style-type: none"> • What is the policy or funding question that the economic evaluation will answer? • Who is the end user of the economic evaluation? • Does the perspective chosen (if not societal) capture the significant costs and outcomes accrued from the initiative? <p>Answer</p> <p>The following perspective will be used for the economic evaluation:</p> <p style="margin-left: 40px;">Societal</p> <p style="margin-left: 40px;">Health sector</p> <p style="margin-left: 40px;">Individual payer</p> <p style="margin-left: 40px;">Other/multiple:</p> <p>User notes</p> <p>Note: When selecting a perspective, you may come across issues of equity (i.e. how different groups experience the initiative). See Step 7 for guidance on how to address this issue.</p>

* Note that NSW Treasury recommends a societal perspective is used based on a cost-benefit approach (see [Step 5](#) below).¹²

[†] For a further description of perspectives, refer to [Appendix B](#) and page 11 of the [NSW Health Guide on Commissioning Economic Evaluations](#).³

Step	Rationale
<p data-bbox="188 357 219 379">2.</p> <p data-bbox="114 408 293 528">Identify the alternative initiative to be the comparator</p>	<p data-bbox="324 156 2119 276">In economic evaluations, the costs and outcomes of an initiative are always measured against one or more alternatives (known as comparators). Depending on the context, a range of study designs and methodologies may be appropriate. While not necessary, sometimes more than one comparator may be used. The comparator may also consist of baseline data collected prior to implementation of the initiative. If the comparator chosen does not match the characteristics of the initiative being evaluated, then the findings from the economic evaluation may not be relevant.</p> <p data-bbox="324 296 2063 352">When deciding on an appropriate comparator, be aware that the target group for the initiative may have a range of services available to them. It may be necessary to understand what other services are available in the absence of the initiative being evaluated rather than assuming absence of all services or interventions as a comparator.</p> <p data-bbox="324 373 427 395">Consider:</p> <ul data-bbox="365 403 1715 507" style="list-style-type: none"> <li data-bbox="365 403 1084 426">• What would be in place if the initiative in question did not exist? <li data-bbox="365 442 1715 464">• Are there initiatives implemented in other settings (e.g. other jurisdictions) that could be considered as relevant comparators? <li data-bbox="365 480 1379 502">• Is the comparator appropriate, and does the setting align with the initiative being evaluated? <p data-bbox="324 520 405 542">Answer</p> <p data-bbox="324 557 869 579">The most appropriate comparator for the initiative is:</p>
<p data-bbox="188 1027 219 1050">3.</p> <p data-bbox="114 1078 293 1166">Select the time horizon for the evaluation</p>	<p data-bbox="324 751 2119 807">The time horizon (or time frame) is the duration over which costs and outcomes are collected and analysed for the economic evaluation. It should be long enough to capture all relevant costs and future outcomes associated with the initiatives (i.e. both the initiative of interest and the comparator).</p> <p data-bbox="324 828 2119 948">It is common for costs of population health initiatives to be incurred at early stages of the initiative, while outcomes may occur far into the future. For example, when evaluating a lifestyle modification program aimed at reducing obesity and ultimately morbidity from chronic diseases and mortality, analysis would need to consider the time required for both initiatives and outcomes to be realised and adjust for changes over time by applying a discount rate. A discount rate should be applied to costs and outcomes that are incurred in the future – see Step 9 for more information.</p> <p data-bbox="324 968 2119 1056">Modelling can be used to forecast long-term costs and outcomes. Modelling can extrapolate from changes in observed intermediate outcomes (e.g. behaviour or risk factors) and use data from the literature to forecast long-term costs and outcomes such as lives saved and quality-adjusted life-years (QALYs). Further information on forecasting is in Step 8.</p> <p data-bbox="324 1077 427 1099">Consider:</p> <ul data-bbox="365 1107 1671 1211" style="list-style-type: none"> <li data-bbox="365 1107 1128 1129">• At what point in time, and for what duration, will costs be incurred? <li data-bbox="365 1145 1211 1168">• How long will the initiative run and at what stage will outcomes be realised? <li data-bbox="365 1184 1671 1206">• Are costs and outcomes data available for the selected time horizon? If not, can costs and/or outcomes be extrapolated? <p data-bbox="324 1225 405 1248">Answer</p> <p data-bbox="324 1262 819 1284">The time horizon for the economic evaluation is:</p> <p data-bbox="324 1453 954 1476">Extrapolation of costs and outcomes will/will not be required.</p>

Step	Rationale
<p>4.</p> <p>Identify an appropriate method for conducting the economic evaluation</p>	<p>The choice of economic evaluation method should primarily be determined by:</p> <ul style="list-style-type: none"> • the needs and expectations of the end users • the decisions that will be made using the results of the evaluation • what is technically possible, appropriate and feasible (including data availability). <p>For a description of economic evaluation techniques, refer to page 12 of the NSW Health Guide on Commissioning Economic Evaluations.³</p> <p>The main types of economic evaluation, and the outcomes they seek to measure,[‡] are:</p> <ul style="list-style-type: none"> • cost-benefit analysis (CBA) – may be conducted when the initiative generates multiple health, social, economic outcomes. Outcomes in a CBA are expressed in monetary units • cost-utility analysis (CUA) – is useful when there is a clear, single health outcome of interest that can be measured either in quality-adjusted life-years (QALYs) or disability-adjusted life-years (DALYs) • cost-effectiveness analysis (CEA) – may be conducted when there is a clear, single health outcome of interest such as a disease event averted, lives saved or a unit of reduction in a risk factor • cost-consequence analysis (CCA) – may be conducted when there are multiple outcomes of interest that cannot all be monetised. Outcomes of a CCA may include diverse measures of health outcome (e.g. reduction in cases of illness or mortality) as well as broader social outcomes (reduction in rates of incarceration, improvements in educational outcomes, indicators of social capital). <p>Consider:</p> <ul style="list-style-type: none"> • Are there multiple outcomes of interest? Can all outcomes be appropriately valued in monetary terms? If yes, a CBA may be appropriate. • Is there a single outcome of interest? Is the outcome to be measured in common natural health units (e.g. life-years saved)? If yes, a CEA may be appropriate. • Is there a single outcome of interest? Is the outcome to be measured in QALYs or DALYs? If so, a CUA may be appropriate. • Are there multiple outcomes of interest? Are there outcomes that would be valued in non-monetary terms? If so, a CCA may be appropriate. <p>Answer</p> <p>The type of economic evaluation to be considered is:</p> <p style="padding-left: 100px;">CBA</p> <p style="padding-left: 100px;">CUA</p> <p style="padding-left: 100px;">CEA</p> <p style="padding-left: 100px;">CCA</p> <p style="padding-left: 100px;">Other/multiple:</p> <p>User notes</p>

[‡] NSW Treasury recommends cost-benefit analysis as the preferred approach for evaluating NSW government programs as it captures social, environmental, and economic impacts, and expresses both costs and benefits in equivalent monetary units. However, there may be valid reasons as to why other methods might be more appropriate. Refer to section 1.5 in the [NSW Government Guide to Cost-Benefit Analysis](#).¹²

Step	Rationale
<p style="text-align: center;">5. Identify the costs to be measured and valued</p>	<p>When planning an economic evaluation, it is important to identify the costs to be included in the analysis. These may include the direct costs of implementing the initiative (e.g. personnel, buildings, equipment and consumables) and the costs experienced by patients during and after the initiative (e.g. GP visits, medication, hospitalisations, travel costs). It is useful to refer to the initiative's program logic to assist in identifying all the relevant costs (and outcomes).[§]</p> <p>The perspective of the evaluation will determine which costs are included. If the perspective of the health sector is adopted for example, costs falling on patients, such as out-of-pocket expenses (e.g. travel costs), would be excluded. On the other hand, if the aim is to adopt a societal perspective, a broader range of costs, such as productivity losses and travel costs, may be appropriate to include.</p> <p>Common sources to measure and value costs include program budgets and other financial records, routinely collected datasets, participant questionnaires, employee award rates and other costs scales set by governments. See Appendix B for further detail on common costs sources for each perspective.</p> <p>Consider:</p> <ul style="list-style-type: none"> • Who is delivering the initiative of interest and the comparator (e.g. doctors, nurses, volunteers)? • What are the different activities of the initiative and comparator? • What are the capital and operational (administrative) costs involved in the initiative and comparator? • Where are the initiative and the comparator delivered (e.g. inpatient or outpatient care)? • How often will individuals or populations participate in the initiative and comparator? • What data sources are available for measuring and valuing costs? What costs data needs to be additionally collected? • Are there any uncertainties in costs data? If so, consider undertaking sensitivity analysis (see Step 10). <p>Answer</p> <p>The following costs will be measured and valued:</p>

[§] If you do not have a program logic, refer to chapter 4 of the [NSW Health Guide to Commissioning Evaluation Services](#) for more information on how to develop a program logic.

Step	Rationale
<p data-bbox="190 635 219 655">6.</p> <p data-bbox="120 687 284 834">Identify how the outcomes are to be measured and valued</p>	<p data-bbox="324 161 2096 213">The outcomes included in an economic evaluation should reflect the policy or investment decision being addressed. For example, if the economic evaluation is being used to inform a decision by Treasury to fund an initiative, then there may be interest in broad social and economic outcomes, as well as health outcomes.</p> <p data-bbox="324 236 2107 288">Health outcomes may be expressed as changes in the number of health-related events (e.g. cases of diseases or deaths), mortality (e.g. number of life-years gained), QALYs or other outcomes which could be important to decision makers. Economic and social outcomes may be separately reported, as in a CCA.</p> <p data-bbox="324 311 2114 363">Alternatively, a single measure of the monetary value of all outcomes (health, economic and social) could be generated for the purposes of a CBA. Two techniques for deriving such monetary valuations are human capital or willingness to pay.¹¹</p> <p data-bbox="324 386 2114 502">Monetary valuations of health outcomes can be derived by applying a 'value of statistical life' to QALY weights or life-years. The value of a statistical life and statistical life-year as published by the Department of the Prime Minister and Cabinet are \$4.2 million and \$0.182 million, respectively.¹⁴ As these values are in 2014 dollars, they will need to be inflated to the first year for the analysis. The application of these values enables monetary valuations to be given to outcomes such as lives saved, decreased morbidity, or reductions in the risk of death.</p> <p data-bbox="324 525 2107 611">Sometimes, it may be necessary to transform intermediate outcome measures (e.g. change in behaviour, reductions in blood pressure) into standardised health outcomes (e.g. lives saved, QALYs) which may be more meaningful to decision makers. When transforming intermediate outcomes, you should justify and quantify the claimed relationship between the intermediate outcome and the standardised health outcomes.</p> <p data-bbox="324 633 427 654">Consider:</p> <ul data-bbox="367 676 2085 842" style="list-style-type: none"> <li data-bbox="367 676 2085 729">• What data sources can be used to measure outcomes? Is primary data collection required or can data be obtained from routinely collected datasets or published literature? <li data-bbox="367 742 1778 762">• Is the population for whom the economic evaluation is being conducted comparable to the intended target group of the initiative? <li data-bbox="367 775 1368 796">• Are data available on long-term outcomes? If not, forecasting may be required (see Step 8). <li data-bbox="367 809 1520 829">• Are there any uncertainties in outcomes data? If so, consider undertaking sensitivity analysis (see Step 10). <p data-bbox="324 865 405 885">Answer</p> <p data-bbox="324 898 887 919">The following outcomes will be measured and valued:</p>

Step	Rationale
<p data-bbox="192 368 215 392">9.</p> <p data-bbox="114 424 293 539">Ensure an appropriate discount rate is applied</p>	<p data-bbox="322 161 2130 245">Economic evaluations must discount costs and outcomes that occur after the first year. The discount rate aims to reflect the opportunity cost of resources for society as a whole in the long term.¹¹ This is because it is accepted in economic theory¹¹ that society places a lower value on events that occur in the future than those that occur in the present. That is, people would rather enjoy benefits now than defer them into the future.</p> <p data-bbox="322 266 1615 290">When planning an economic evaluation, ensure that an appropriate discount rate is used. Guidance on discount rate can vary:</p> <ul data-bbox="367 304 2051 432" style="list-style-type: none"> <li data-bbox="367 304 2018 360">• For economic evaluations conducted on NSW Government initiatives, NSW Treasury typically recommends applying a discount rate of 7% for both costs and outcomes.¹² See Step 10 for more detail on sensitivity testing of discount rates. <li data-bbox="367 373 2051 432">• For a submission to list a new medicine or medicinal product on the Pharmaceutical Benefits Schedule, the Pharmaceutical Benefits Advisory Committee (PBAC) recommends applying a discount rate of 5% with sensitivity analyses at 3.5% and 0% for both costs and outcomes.¹⁴ <p data-bbox="322 453 427 477">Consider:</p> <ul data-bbox="367 491 1077 555" style="list-style-type: none"> <li data-bbox="367 491 987 515">• Has the end user specified the discount rate expected? <li data-bbox="367 528 1077 555">• If so, are there any requirements to test lower and upper rates? <p data-bbox="322 576 412 600">Answer:</p> <p data-bbox="322 614 779 638">The following discount rate will be applied:</p>
<p data-bbox="185 1011 221 1035">10.</p> <p data-bbox="120 1062 291 1241">Plan for sensitivity analysis in the final stages of the economic evaluation</p>	<p data-bbox="322 775 1167 799">The results of an economic evaluation may be reliant on estimates or assumptions.</p> <p data-bbox="322 813 2119 898">Sensitivity analysis is the process of varying assumptions used in the economic evaluation to examine their effect on the findings. This will provide valuable information to decision-makers about the robustness of the findings of an economic evaluation. For example, if you have assumed a cost for an input in the initiative, you should perform the economic analysis with this assumption varied between its likely lower and upper limits to check the impact on the outcome of the economic evaluation.</p> <p data-bbox="322 912 2119 968">Discount rates should also be tested in sensitivity analyses to determine whether they have an impact on results. NSW Treasury recommends sensitivity testing of discount rates of costs and outcomes at 3% and 10% (in real terms) to test how robust results are at these different rates.¹²</p> <p data-bbox="322 989 427 1013">Consider:</p> <ul data-bbox="367 1027 1256 1206" style="list-style-type: none"> <li data-bbox="367 1027 1211 1051">• What are the key assumptions that will be used in the economic evaluation? <li data-bbox="367 1066 1106 1090">• Were any uncertainties within costing or outcome data identified? <li data-bbox="367 1104 1010 1128">• Do upper and lower discounting rates need to be tested? <li data-bbox="367 1142 1256 1166">• Are the results from a sensitivity analysis likely to have a bearing on the findings? <li data-bbox="367 1181 1205 1206">• Have you documented the assumptions that will require sensitivity analysis? <p data-bbox="322 1227 405 1251">Answer</p> <p data-bbox="322 1265 1267 1289">What are the parameters or assumptions that should be considered for sensitivity analysis?</p> <p data-bbox="322 1370 1312 1394"><i>(If applicable)</i> The lower and upper discount rates to be tested through sensitivity analyses are:</p>

¹¹ Refer to Appendix 4 of the [NSW Government Guide to Cost-Benefit Analysis](#) for further information.

Step	Rationale
<p data-bbox="185 539 226 564">11.</p> <p data-bbox="125 592 282 772">Develop your statement of purpose, summarising the above information</p>	<p data-bbox="322 156 2107 213">As you finalise the components of this checklist and start to develop your project documents, you will need to define the issue being addressed, including clear statements on the purpose of the economic evaluation, intended audience, time horizon, perspective and initiatives for comparison.</p> <p data-bbox="322 233 1037 258">The statement of purpose should include the following information:</p> <ul data-bbox="369 279 1200 488" style="list-style-type: none"> <li data-bbox="369 279 573 304">• the initiative(s) <li data-bbox="369 325 898 351">• the health problem addressed by the initiative <li data-bbox="369 371 931 397">• the economic question underlying the evaluation <li data-bbox="369 418 629 443">• the units of analysis <li data-bbox="369 464 1200 489">• the intended audience of the economic evaluation and how it will be used. <p data-bbox="322 509 2125 566">When developing documents to commission economic evaluations, providing as much information as you can in your RFQ/RFT/EOI will be helpful in receiving comprehensive submissions and selecting an appropriate service provider.</p> <p data-bbox="322 585 427 611">Consider:</p> <ul data-bbox="369 632 1352 751" style="list-style-type: none"> <li data-bbox="369 632 960 657">• What is the underlying policy issue to be addressed? <li data-bbox="369 678 1352 703">• Will it be answered by a finding of cost-effectiveness or cost-benefit around the initiative? <li data-bbox="369 724 842 750">• What other supporting data are needed? <p data-bbox="322 786 434 812">User notes</p>

References

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Appendix A

Worked example of the Planning Economic Evaluations Checklist

Cost effectiveness of a public health intervention to reduce cardiovascular disease risk

The *Colorado Heart Healthy Solutions* was an intervention that involved deploying community health workers (CHWs) to address cardiovascular risk. The CHWs were based in churches, local businesses, homeless shelters and public health clinics, and with the aid of a screening and decision support tool, screened individuals for cardiovascular risk. Where relevant, CHWs provided medical referrals and lifestyle modification support.

In this Appendix we provide a rationale around a planned economic evaluation methodology using the Planning Economic Evaluations Checklist. Note, our assessment has replaced the explanatory text in this example.

Step	Rationale
<p>1.</p> <p>Select a perspective for the evaluation</p>	<p>Answer</p> <p>The economic evaluation of the <i>Colorado Heart Healthy Solutions</i> program will use a health system perspective.</p> <p>This perspective has been chosen because the economic evaluation aims to assess whether a community health worker (CHW)-based intervention is cost-effective and has the potential to reduce total health system costs. Thus, the health system would benefit most from any downstream savings in healthcare utilisation as a result of the initiative.</p> <p>The funding question that the economic evaluation attempts to answer is whether a CHW-based population health program (in the form of the <i>Colorado Heart Healthy Solutions</i> program) can improve health while providing value for money to the health system.</p> <p>As a state-wide program, the end users of this economic evaluation are likely to be public health policy and funding decision makers within relevant government health departments.</p> <p>Costs and outcomes from a health system perspective that are accrued from the initiative have been identified. See Steps 5 and 6 for further information.</p>
<p>2.</p> <p>Identify the alternative initiative to be the comparator</p>	<p>Answer</p> <p>In the economic evaluation of the <i>Colorado Heart Healthy Solutions</i> program, the initiative will be compared to usual care (i.e. not receiving the initiative) in the form of a before and after study.</p>
<p>3.</p> <p>Select the time horizon for the evaluation</p>	<p>Answer</p> <p>The <i>Colorado Heart Healthy Solutions</i> program includes multiple long-term health outcomes related to cardiovascular risk. The economic evaluation will use a time horizon of 30 years to ensure that these can be captured.</p>

Step	Rationale
<p>4.</p> <p>Identify an appropriate method for conducting the economic evaluation</p>	<p>Answer</p> <p>The <i>Colorado Heart Healthy Solutions</i> economic evaluation will aim to assess the impact of the intervention in terms of improvements in cardiovascular risk on survival, quality of life and costs of the intervention. Therefore, the most appropriate method of economic evaluation will be a CUA. This is appropriate as the health implications of preventing cardiovascular events (such as stroke, congestive heart failure and myocardial infarction) are reflected in not only survival but quality of life.</p> <p>CBA and CCA will not be used as the economic evaluation is interested in one single outcome of interest. CBA is also not the most appropriate method as not all health outcomes (mentioned above) are valued in monetary terms.*</p> <p>The economic question for this evaluation is whether a CHW-based initiative (in the form of <i>Colorado Heart Healthy Solutions</i>) can improve health while providing value for money. The CUA answers this economic question (and therefore address the needs of end users) by comparing the direct costs of the intervention with the outcomes of participants in the intervention.</p>
<p>5.</p> <p>Identify the costs to be measured and valued</p>	<p>Answer</p> <p>The <i>Colorado Heart Healthy Solutions</i> economic evaluation will include costs associated with adverse health events and the following direct delivery costs of the program:</p> <ul style="list-style-type: none"> • staff salaries • infrastructure, including maintenance of the screening and decision support tool • general costs including travel, CHW training, testing supplies and educational materials • logistical costs including cell phones, office/medical supplies, postage/shipping and promotion/printing. <p>Costs will be calculated by summing program costs and costs associated with adverse events. Costs for acute events (stroke and myocardial infarction (MI)) will be assumed to occur once, while costs for continuous event states (post-stroke, post-MI survival and congestive heart failure) will be applied annually.</p> <p>The program delivery costs will be divided by the number of clients served in 2015, creating a cost per-client, per year.</p> <p>Costs associated with disease events (stroke, post-stroke survival, MI, post-MI survival and congestive heart failure) will be factored into the model based on the estimates drawn from the literature.</p> <p>Consistent with the health sector perspective of the analysis, out of pocket costs to patients will not be included in the economic evaluation.</p>
<p>6.</p> <p>Identify how the outcomes are to be measured and valued</p>	<p>Answer</p> <p>The outcome of the <i>Colorado Heart Healthy Solutions</i> economic evaluation will be measured in QALYs gained by program participants.</p> <p>QALYs will be calculated using utility data drawn from the literature for each disease event (stroke, post-stroke survival, MI, post-MI survival and congestive heart failure).</p> <p>Total QALYs will be calculated by multiplying the length of time spent in the health state by the utility value associated with each state.</p> <p>Using a Markov model, this will be extrapolated over a 30-year time frame for both the intervention cohort and comparator group based on initial observed improvement in cardiovascular risk.</p>
<p>7.</p> <p>Identify whether subgroup analysis is required</p>	<p>Answer</p> <p>The <i>Colorado Heart Healthy Solutions</i> economic evaluation will undertake a subgroup analysis for high-risk populations, defined as people with abnormal baseline CVD risk factors.</p> <p>It is noted that the overall population targeted by the program is relatively disadvantaged, as it specifically includes hard-to-reach rural residents, minorities, and the medically underserved throughout Colorado.</p>

* Refer to Section 6 of the NSW Health Guide on Commissioning Economic Evaluations for more information.

Step	Rationale
<p>8.</p> <p>Determine if forecasting for future costs and benefits is required</p>	<p>Answer</p> <p>Forecasting will be required for the <i>Colorado Heart Healthy Solutions</i> economic evaluation to project costs and outcomes data for the 30-year time horizon. To achieve this, a Markov model will be used to extrapolate costs and outcomes beyond the duration of the original study undertaken to assess outcomes of the initiative (2 years).</p>
<p>9.</p> <p>Ensure an appropriate discount rate is applied</p>	<p>Answer</p> <p>Considering the time horizon of the <i>Colorado Heart Healthy Solutions</i> economic evaluation (30 years), costs and outcomes incurred in the future by participants are relevant to the analyses. Therefore, a discount rate is appropriate. In this case, a rate of 3% will be applied to costs and QALYs occurring after one year. The discount rate will also be tested at 0% and 6% (sensitivity analysis).</p>
<p>10.</p> <p>Plan for sensitivity analysis in the final stages of the economic evaluation</p>	<p>Answer</p> <p>The <i>Colorado Heart Healthy Solutions</i> economic evaluation will undertake sensitivity analysis on a range of assumptions and inputs, including:</p> <ul style="list-style-type: none"> • transition probabilities from a healthy state to an adverse outcome • utilities or the 'disability weight' used to calculate the QALYs • costs • discount rates. <p>The economic evaluation will assess the extent to which variation in assumptions and inputs impacts the outcomes, in particular whether the initiative is cost saving or has positive incremental QALYs.</p>
<p>11.</p> <p>Develop your statement of purpose, summarising the above information</p>	<p>Answer</p> <p>The cost-effectiveness of CHW-based cardiovascular disease (CVD) risk reduction interventions is not well established. While the <i>Colorado Heart Healthy Solutions</i> program has been shown to reduce modifiable CVD risk factors, cost-effectiveness is unknown.</p> <p>This economic evaluation will determine the costs and cost-effectiveness of the <i>Colorado Heart Healthy Solutions</i> program, a CHW-based cardiovascular disease (CVD) risk reduction program targeting hard-to-reach rural residents, minorities, and the medically underserved throughout Colorado. The aim of the program is to improve CVD health across Colorado by promoting access to primary care and encouraging healthy behaviour.</p> <p>The economic evaluation will compare the <i>Colorado Heart Healthy Solutions</i> program with usual care and will be undertaken from the perspective of the health sector. The audience for this economic evaluation will be public health policy and funding decision makers within health departments.</p> <p>Costs associated with direct delivery of the <i>Colorado Heart Healthy Solutions</i> program and adverse CVD events will be identified and valued over a 30-year time horizon using a Markov model. Cost savings and QALYs gained will be used as the outcome metrics. Cost-effectiveness will be reported through incremental cost savings which will represent the savings of the <i>Colorado Heart Healthy Solutions</i> program relative to usual care, in achieving a gain in QALYs among participants.</p>

Appendix B

Evaluation perspectives

When performing an economic evaluation, consideration needs to be given to the perspective for the study. This will be informed by the underlying policy or investment decision that the economic evaluation aims to address for the end user. For instance, if the study is commissioned by State Government they may only be interested in an 'individual payer perspective' in which the only relevant costs are those incurred by them.

Alternatively, the study might address a broader research or investment decision through a broader health sector or societal perspective.

The choice of perspective will influence the data collection strategy and the types of costs and outcomes included in the evaluation. The table below provides examples of costs and outcomes which may be included in analyses from individual payer, health sector and societal perspectives.

Costs and outcomes for different perspectives		
Individual payer	Health sector	Societal
<p>Only includes costs and outcomes relevant to a particular agency (e.g. State Treasury, State Ministry of Health, Medicare or a private insurer).</p> <p>Examples of items that could be costed using this perspective include:</p> <ul style="list-style-type: none"> • drugs • medical devices • procedures • equipment • facilities • staff • organisational overhead costs. <p>Examples of outcomes that may be captured using this perspective include individual health outcomes and reduced usage of other services provided by the agency as a result of improved health outcomes (e.g. reduced length of hospital stays).</p>	<p>Costs and outcomes incurred across the entire health sector irrespective of the agency to which they incur.</p> <p>For instance, an early hospital discharge program that involves recovery at home supplemented by GP visits will incur costs to both the NSW Ministry of Health (hospital costs of initial hospitalisation) and Medicare (costs of GP visits). Both types of costs need to be counted when adopting a health sector perspective.</p> <p>A health sector perspective rather than individual payer perspective may provide more detail on whether an intervention is cost saving (i.e. genuinely uses less resources) rather than one that shifts costs between different payers such as levels of government (e.g. state government to Medicare). Using a health sector perspective, all costs and outcomes (irrespective of health sector agency) are included in the analysis.</p>	<p>Includes costs and outcomes incurred across all actors in society as a result of an intervention.</p> <p>This includes costs and outcomes within the health sector, as well as costs and outcomes in the wider community by individuals (e.g. workers, students) and organisations (e.g. employers, other government departments). Examples of non-health sector costs and outcomes include patient time spent for travel and receiving treatment, changes to productivity at work, work attendance, costs to employers to hire and train replacement workers, and costs and outcomes in other sectors (e.g. social services, criminal justice, and the voluntary sector).</p> <p>As in the previous example an argument for a societal perspective over a narrower health sector perspective is that the latter can fail to distinguish between a cost saving intervention from one that shifts costs from the health sector onto patients and the community. Using a societal perspective, all costs and outcomes, irrespective to whom they are incurred, count.</p>

