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DEPARTMENT: PERFORMANCE MONITORING AND EVALUATION

DPME Evaluation Guideline No 2.2.15

Guideline on Economic Evaluation

Created 20 March 2014

Addressed to	Government departments who are undertaking evaluations (programme managers and M&E staff) as well as evaluators of government programmes and policies.
Purpose	The purpose of this Guideline is to provide technical guidance on undertaking or managing an Evaluation Synthesis
Policy reference	This guideline should be read in conjunction with the National Evaluation Policy Framework approved by Cabinet on 23 November 2011 (available on the DPME website).
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1 Introduction

This Guideline is designed to assist government departments to effectively plan and manage economic evaluations. It covers a definition and description of an economic evaluation, key questions economic evaluations can answer, different forms of economic evaluation, common methods and approaches and key issues to be considered in managing economic evaluations. This is a broad guideline that can be applied in different contexts. It is focused on providing an overview for government staff managing evaluations and is not targeted as a manual for an evaluator on how to undertake an economic evaluation. Hence it does not go into detail into the different tools that are introduced. Note the word programme is used here but the evaluation could equally apply to a policy, or plan – so while programmes are the most common unit being evaluated, we use the term intervention to cover any of these.

2 Definition of economic evaluation

National Treasury refers to Economic Analysis as “analys(ing) the viability of a project based upon economic and social welfare improvements, and not financial bankability”. An economic analysis as opposed to financial analysis takes non-monetary welfare impacts into account, such as improved health, reduced accident risks, congestion and pollution. Economic analysis excludes transfers (e.g. taxes, subsidies) in assessing costs and benefits. Care needs to be taken as market prices may not always reflect true resource costs – e.g. environmental costs may be excluded.

All large projects or programmes should undertake an ex-ante (prior to implementation) cost-benefit analysis or a cost-effectiveness analysis for each of the preferred options. Generally, cost-benefit analysis is more appropriate for economic infrastructure projects, e.g. transport, water, energy and communications sector projects, whereas a cost-effectiveness analysis will be more appropriate for social infrastructure projects, e.g. health, and education. (National Treasury, 2013). Annex 2 has the full definitions used by National Treasury. The National Evaluation Policy Framework (NEPF) describes economic evaluation as one that compares programme or policy costs and benefits.

Full economic evaluation, which considers both the costs and benefits of an intervention, includes cost-effectiveness analysis (CEA), cost-benefit analysis (CBA) and cost-utility analysis (CUA). Full

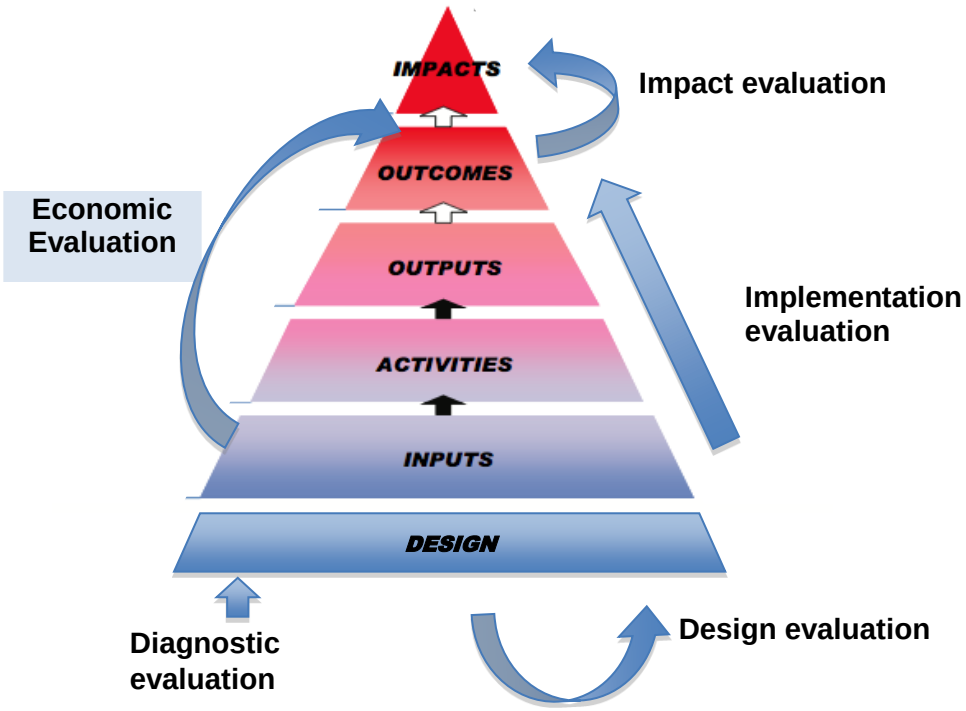
economic evaluations always include comparison of alternatives (where alternative could be another programme or intervention, or "doing nothing"). Partial economic evaluations only partially meet the formal definition of economic evaluation given above, either because they:

- compare alternatives but focus on costs only;
- focus on costs only and do not compare alternatives;
- focus on both costs and consequences but do not compare alternatives.

A term that is often used is Value for Money. This is often used to refer to the benefit-cost ratio (ie in monetary terms), while also taking into account non-monetary outcomes. There are examples of methodologies which can take non-qualitative elements.

Figure 1 depicts where economic evaluation is placed in the DPME framework.

Figure 1: Relationship of evaluations to results-based management



3 Purpose of economic evaluation

The purpose of economic evaluation is the comparative analysis of alternative courses of action in terms of both their costs and outcomes.

Economic evaluation informs service delivery by:

- Identifying which of competing interventions/programmes maximise outcomes;
- Identifying winners and losers amongst different stakeholder groups, including assessing the equity and pro-poor elements of an intervention;
- Determining efficient budgetary allocations given resource constraints;
- Providing evidence to key decision-makers on value of particular programmes.

Economic evaluation can be used at different stages of programme implementation. It is often used during the planning phase (ex-ante) to:

- choose between competing programmes or options for delivery;
- determine whether a programme might provide good value;
- inform efficient allocation of resources between programmes.

It can be used during or after the evaluation phase to:

- determine whether a programme provided good value;
- decide whether to continue, expand, reduce, or terminate a programme.

Economic evaluation is important because it can aid decision-makers with their difficult choices in allocating public resources, setting priorities, and defining policy. Decision-makers are always concerned about scarce resources in the face of unlimited wants. They need to use resources as efficiently as possible and demonstrate value for resources expended. This reality means making trade-offs or linking one thing to get another. Economic evaluation helps with making these decisions.

For example, it helps explore opportunity costs. This refers to the cost of what we give up in order to gain something else. It is not simply the amount of rands expended but the true cost of not doing something. For example, if we have fixed resources and we hire a data manager for a programme, we will not have the resources to hire a social worker. The opportunity cost of hiring a data manager is the opportunity to add an additional social worker to the programme. Similarly, if a teacher working in a school with limited resources gives one student additional tutoring, that time will not be available to provide tutoring to another student.

Economic Evaluation is useful because it helps us understand what is the most effective and efficient way to deliver a programme or service and it helps facilitate the use of scarce resources in order to maximize outcomes. However, economic forecasts are not always reliable and should be scrutinized – particularly in terms of the assumptions that are used to construct these forecasts. If the conditions that were assumed change, the models have to be updated. The problem, often, is that programme managers do not always understand the methods used to construct these forecasts. In these situations they need to rely on an impartial review of the evaluation, especially when the cost is high.

4 Typical economic evaluation questions

There are several generic economic evaluation questions. Specific questions determine which economic evaluation methods should be chosen. Different methods answer different questions. Some examples of questions and related methods include:

- What are the costs and effects of various alternatives? Which alternative is the most affordable? Is this an efficient way to achieve outcomes? A common method to answer these questions is Cost-Effectiveness Analysis.
- Do the programme costs outweigh its benefits? Is the programme providing value for money? Is this programme worthwhile? What is the net social benefit resulting from a programme? A common method to answer these questions is Cost-Benefit Analysis.

Most evaluations might not have reliable measures of the benefits – both to beneficiaries and indirectly (as externalities). The same goes for the costs – which, over and above the direct opportunity cost, may also have externalities that are not considered. Therefore, it is unlikely that an economic evaluation will be able to completely answer “Do the programme costs outweigh its benefits?” and “What are the costs and effects of various alternatives?” In most cases they will provide some but not full evidence. It is important to manage expectations in this context.

Table 1 shows the main questions and the main tools that can be used. More details on the specific methods that address these questions are provided in the following section.

Table 1: Questions and methods for different impact questions

Purposes	Common impact evaluation questions	Common evaluation methods and approaches
Element 1: Full economic evaluation	What is the benefit-cost ratio for different options (in monetary terms)?	• Cost-benefit analysis (CBA)
	What is the benefit-cost ratio for different options (using a standard such as cost per full-time job equivalent)?	• Cost-effectiveness analysis (CEA)
	What is the benefit-cost ratio for different health options (using a standard such as quality adjusted life years)?	• Cost-utility analysis (CUA)
	What is the efficiency of investing in X or Y	• Return on Investment (ROI)
Element 2: Partial Economic evaluation	What is the cost of one specific intervention?	• Cost description
	What proportion of the expenditure on a programme is going to services to final beneficiaries?	• Public Expenditure Tracking Systems (PETS)
	What is the cost of a number of alternatives?	• Cost analysis
	What is the cost of different programmes and the consequent impact on future costs?	• Cost offset analysis
Element 3: Decision analysis	What are the consequences of decision A or B? What are the consequences of decision A or B where the future is only dependant on the present, not the past	• Modelling • Decision-trees • Markov models
	What are the consequences of decision A or B when there are multiple, usually conflicting, criteria, and where there is a real or perceived difference between available options?	• Multi-criteria decision analysis

5 Methodology

The main difference between different forms of economic evaluations is how they itemize and value effects. These differences reflect different aims and viewpoints on the different economic questions they seek to answer.

5.1 Full economic evaluation approaches

Full economic evaluation approaches include:

- **Cost-benefit analysis (CBA)**, which involves measuring costs and benefits in common units, usually monetary.
- **Cost-effectiveness analysis (CEA),** which measures benefits in natural units such as life years saved or improvements in functional status.

Cost-utility analysis, (CUA) which is a specific type of CEA used for the analysis of health-related effects. This measures a programme's effect on both quantitative and qualitative aspects of health (morbidity and mortality), using a utility based measure such as quality adjusted life years (QALYs).

Tip
- CEA and CBA are decision aids; they are not a decision
- They help organize decisions, but other inputs are needed to make a decision

Comparison of CBA and CEA

CBA measures costs and benefits in money terms. It allows you to compare alternatives that do not have the same outcomes and to compare strategies that have multiple outcomes across different public sector areas (e.g., health, education, transport). For example, CBA would be an appropriate method to use to decide between funding a health programme and an education programme. In contrast, CEA is useful for comparing alternatives that are trying to achieve the same objective. For example, CEA can be used to compare different strategies aimed at increasing HIV testing rates.

CBA studies are usually more complicated and require more resources. They require more time for analysis and involve significant methodological expertise. A CBA study is used only when it is possible and reasonable to monetise benefits and costs (including resources expended and negative impacts). Some benefits can be very difficult to measure. The value of the increased accuracy must be weighed with costs associated with the need for additional data collection. The more intangible the benefit, the more likely it is that a CEA will be more appropriate.

Key Points
- A full economic evaluation compares both the costs and consequences of two or more interventions.
- A full economic evaluation requires the identification, measurement and valuation of both costs and consequences.
- A full economic evaluation is the only type of economic analysis that provides valid information on efficiency.

Special note on Return on Investment Analysis

Return on Investment analysis (ROI) is a methodology that originated in financial markets. ROI measures the gain or loss generated on an investment relative to the amount of money invested. ROI is usually expressed as a percentage and is typically used for personal financial decisions, to compare a company's profitability or to compare the efficiency of different investments. In the recent years, the ROI concept started to be used in the public sector. ROI analysis and CBA measure similar indicators, but ROI is sometimes calculated from a narrower perspective than CBA (e.g., from a purely financial persoective or the perspective of an individual provider rather than a more comprehensive societal perspective). As a rule, ROI is presented as percentage. In CBA analysis, results can be presented in monetary terms or as a ratio of benefits to costs.

USEFUL TIP

If net costs of a programme are R50000, and net benefits are R75000, results of the CBA analysis can be described as:

Benefit to Cost Ratio = R75000/R50000 = 1.5
or
ROI = (R75000-R50000)/R50000)*100% = 50%

5.2 Partial economic evaluation approaches

The main types of partial economic evaluation include:

- **Cost description**, which examines only one programme and its costs. The term "costing study" is also used. Cost description can be done as a separate study, but also serves as a building block in many full economic evaluations.
- **Cost analysis**, which considers one or more alternatives, and only examines costs for these alternatives.
- **Cost offset analysis**, which examines the costs of different programmes and the consequent impact on future costs.

Cost analysis

Cost analysis includes both financial and economic costs. Financial costs refer to the direct programme costs. Economic costs are broader and include true resource consumption. This includes the costs incurred by others, including costs to participating service clients, and negative impact costs. For example, the financial cost of a school feeding programme would include the costs identified in the project budget. The economic costs would also include the cost of teachers' time to supervise it, the cost of volunteers' time to prepare meals, and the cost of reductions in teaching time caused by the feeding program.

It can be particularly difficult to correctly assess costs in programmes that are multi-sector or have multiple funders. This is because of the complicated cost structures and multiple systems, where routine financial data are captured. The systems include heterogeneous accounting and financial reporting standards needed to meet different donor requirements, and multiple programme staff with true resource use knowledge. In such programmes, correct assessment of costs can be very time-intensive.

An important factor to consider is with what precision data on costs need to be collected. Sometimes, detailed data on every resource used needs to be collected from the bottom up. The more heterogeneous the programme is in terms of what it delivers, the more detailed data on every resource used is needed to correctly determine the costs (known as micro-costing). Where "service packages" delivered through the programme are relatively standard (e.g. exactly the same type and amount of educational support provided to participants regardless of age), it is often enough to assess costs at an aggregate level and simply divide by a number of participants to calculate average cost (known as macro-costing).

Public Expenditure Tracking Surveys (PETS) provide an example of a specific survey tool used in economic evaluation. Originating in Uganda, these studies use a very detailed and rigorous methodology to track the flow of approved expenditures from the department to the intended users (individual schools, health clinics etc.). The PETS requires matching financial information obtained from a survey of specific facilities (or institutions) to fiscal data on the allocation of resources to these same facilities (or institutions), in order to measure leakage of funds away from the purposes these were originally intended for. Questionnaire frameworks for specific facilities include domains on facility characteristics; inputs (e.g., personnel, materials, equipment), measured in monetary terms; outputs; quality; financing (where is the money coming from?) and institutional mechanisms and system of accountability.

5.3 Use of decision analysis in economic evaluation

Decision analysis is the application of explicit and quantitative methods to analyse decisions under conditions of uncertainty. This type of analysis is also sometimes referred to as **modelling.** Decision models aim to inform decisions and must compare alternative strategies. They must fit within economic evaluation methodologies.

The two basic forms of decision-analytic models are decision trees and Markov models. A decision tree is a visual representation of all possible options and consequences that may follow each option.

Markov models offer tools for situations where the methodology has to include more extended time horizons, differential timing of events, and recurring events. In addition to traditional decision trees and Markov models, other modelling techniques, such as dynamic models, have been used to evaluate the consequences of interventions. These models, based on differential equations, are often used to evaluate healthcare programmes which model transmission effects in infectious diseases.

Tip: When to consider modelling in economic evaluation:

- Policy models and national projections
- Transferring evidence from one country to another
- Extrapolating impact beyond the time horizon of the particular programme
- Assessment of prevention programmes
- In health studies, combining evidence from short-term clinical trials and long-term epidemiological studies

5.4 Special note on multi-criteria decision analysis

Multi-Criteria Decision Analysis (MCDA) is a sub-discipline of operations research that considers decision making in the presence of multiple, usually conflicting, criteria, of which one is usually cost and another quality. It is not considered a type of economic evaluation but has methodological commonalities with economic evaluations. Both methods could be combined to assist in decision-making. In these guidelines, only the general overview of MCDA is provided, and specific implementation issues are not discussed. However, due to the methodological overlap between MCDA and CBA, many of the implementation issues described in this guidance will be relevant to MCDA as well.

Key features of MCDA include:

- Deciding between multiple, sometimes conflicting, options;
- Optimisation to create numerical scores, to evaluate different alternatives on a single scale of utility or value;
- Utilization of decision maker's judgement in establishing objectives and criteria and determining the relative criteria weights.

Key methodological approaches of MCDA include:

- Multi-attribute utility theory;
- Multi-attribute value theory;
- Analytical hierarchy process;
- Outranking.

These use an optimization process to determine the numerical scores that will be used to value different alternatives. Multi-attribute utility theory and multi-attribute value theory approaches calculate scores from how alternatives perform relative to specific criteria. Scores then can be summed, averaged, or aggregated using a weighting mechanism to calculate an overall score.

Specific attributes deemed more important by decision makers can be given a higher weight relative to attributes deemed less important. Scores, for instance, can be determined by surveying

stakeholders to determine their perception over multiple options. Analytic hierarchical processes decompose problems into a hierarchy of easily comprehended sub-problems, each of which can be analysed independently. There is a systematic evaluation using pair-wise comparisons with respect to their impact on an element above them in the hierarchy. Outranking assumes that one alternative must dominate another or must perform better on at least one criterion and no worse on others. This procedure compares alternatives according to each criterion and then aggregates preferences across relevant criteria.

In the MCDA approach, the focus is on variables where there is a real or perceived difference between available options. It does not require the inclusion of variables deemed equal across alternatives. Specific steps included in MCDA are oultined in Annex 3.

Key implementation factors and challenges associated with MCDA include:

- Inclusion of all relevant stakeholders so that weights and scores accurately reflect preferences;
- Possibility of reaching inconclusive assessment due to lack of information, conflicting criteria, uncertainties stemming from subjective judgement, and different preferences among different decision makers;
- Necessity of mutually independent preferences where the rating of an alternative on one criterion is not affected by the performance of other criteria.

6 Common challenges to implementing economic evaluation

6.1 Omission of important costs and benefits

The types of costs and benefits that are important to include in the economic evaluation depends on one's perspective. The use of a broad perspective (e.g., societal perspective) often presents the biggest measurement challenges, including as far as possible the quantification of negative externalities (in economics an externality is the cost or benefit that affects a party who did not choose to incure that cost or benefit. For example, acid mine drainage from mining pollution can cause costs for the whole of society. In some cases, it is appropriate for a programme manager to make these decisions while at other times an economic evaluator should be involved. Other factors may be displacement effects, where economic activity, jobs etc are displaced by a project. In these situations, it is necessary to make a judgement on whether the omitted items, if included, would make a substantial difference to the study results.

For example, a broad societal perspective is often considered a "gold standard", but it may conflict with what is preferred by the decision maker. In such cases, programme managers should ask the evaluation team to explore how their preference influences the study's robustness, and for additional options. In certain cases, where it is not feasible or practical to measure some important costs and monetise benefits, more limited analyses can still be conducted. These can also be supplemented by the detailed description of omitted costs and benefits and their potential effects on the study conclusion.

6.2 Selection of alternatives for comparison

The choice of alternative(s) is critical in economic evaluation. The alternative could be "do nothing" or another programme. In choosing another programme as comparator, it is usually recommended that the most relevant alternative is "current practice" or the most widely used approach or in the region/setting. However, if "current practice" is itself inefficient, then other comparators should be considered (e.g. other viable low cost alternatives). Other challenges may arise if current practices differ by region. Programme managers (possibly in consultation with other stakeholders and decision makers) should advise economic evaluation teams on which alternatives are relevant for the analysis.

6.3 Discount rates

The future values of benefits are usually discounted, compared to benefits that will occur soon. This is due to the effect of inflation on the cost-benefit ratio, as costs are generally incurred in today's money, and are worth less by the time benefits accrue, as well as the uncertainty of future benefits.

For example, in the United States, Circular A-94 of the Office of Management and Budget states that the discount rate that federal agencies must use for economic evaluations should be based on current interest rates but vary depending on the time frame of the analysis. A study by the Asian Development Bank found that developed nations tended to use real rates of between three and seven per cent. Developing nations used a higher rate of 8% or more, reflecting the higher risk and uncertainty of public investments in those nations. A World Bank paper has argued for a real rate of 3% to 5%. United Kingdom health agencies recommend a 1.5% discount rate for health interventions with long term effects.

The World Bank recommended discount rate of 3-5% is one of the most commonly used in economic evaluations for developing countries. Economic evaluation teams should ensure that evaluation protocols and reports clearly state which discount rate(s) are utilised in the analysis and provide justification for the rates chosen. The choice of a discount rate is more influential in studies where costs and benefits are incurred within a long time horizon, and may require more extensive sensitivity analyses.

6.4 Equity issues

Another challenge is how to adequately address issues of equity in economic evaluation. Equity in economic evaluation refers to how the benefits and costs of interventions are distributed across population groups. Most economic evaluations focus on the average effect and don't consider whether a programme increases or reduces disparities. Methods to incorporate equity within economic evaluation techniques range from qualitative judgements to quantitative outcomes-based equity weights. No method has been universally accepted to date.

Economic evaluation should reflect the intentions of the public sector and equity considerations relevant to specific topics. How these are addressed in economic evaluations must be explicit in reports. While formal equity weighting is sometimes done in health economic evaluations, it is not as common in other sectors. If formal adjustments are not practical and feasible, economic evaluation teams should consider the feasibility of conducting analyses of the different subgroups. This would provide programme managers with descriptive information of distributional impacts.

Useful Tip: Methods to assess distribution of impacts could include:

- Sub-group analyses based on the socio-economic status or demographic characteristics;
- Spatially based analyses that uses spatial units, such as census tracts, or traffic-analysis zones for transport projects;
- Micro-simulation modelling that uses a set of actual or synthetic individuals or households that represent the population.

6.5 Inadequate characterisation of uncertainty

Economic evaluations should include sensitivity analyses to address uncertainty. Sensitivity analyses include varying the estimates of key parameters to assess the sensitivity of the study result to the various assumptions. Annex 2 also has what National Treasury says about risk and sensitivity analysis on capital projects. The following describes two common flaws in sensitivity analyses:

- The choice of parameters to vary, and the range over which they are allowed to vary, are often not adequately justified;
- Failure to account for the combined effect of several parameters varying at the same time (i.e., only 1-way sensitivity analyses are conducted).

To avoid the first potential flaw, evaluation teams should provide full justification explaining which parameters are included in the sensitivity analyses and utilize defendable parameter ranges which are feasible (such as the 95% confidence interval around the estimate). To account for a combined effect of several parameters, evaluation teams should consider the development of probabilistic models, Bayesian interpretations of data[1] and the use of cost-effectiveness acceptability curves.

7 Critical issues when planning and managing economic evaluations

This section covers particular challenges that may be encountered in relation to economic evaluations. It draws on the quality criteria set out in the NEPF, specifically: relevance and timeliness, legitimacy, credibility, ethics and trade-offs, raising any specific issues arising in relation to economic evaluations.

Economic evaluations often rely on multiple data sources, which can include data abstraction, key informant interviews and survey data collection. The programme manager's role in these data collection activities will be similar to that of other evaluation types. When planning and managing economic evaluation it is important to understand common critical issues and the planned uses of the evaluation.

7.1 Relevance and timeliness

An economic evaluation needs to be planned to align with when information is needed to inform a decision about resource allocation (in time for decision-making processes). It also needs to take into account the availability of information about financial and economic costs, and the time or resources needed to generate these. This is of importance in programme and policy development.

7.2 Legitimacy

Economic evaluation enforces the organisation and systemisation of information. This forces the evaluator or manager to detail all probable outcomes and the probabilities of those outcomes. This process needs to include relevant stakeholders that have an interest in the evaluation to ensure that the evaluation methodology is viewed as legitimate by users and those affected by evaluation findings. Transparency in assumptions and appropriate sensitivity analyses are critical in avoiding bias, and these parameters must be decsribed in the reports.

7.3 Credibility of the evidence

High-quality full economic evaluations are conducted less often than other types of evaluations. Economic evaluations are resource intensive and require a high level of research expertise. In addition, data deficiencies can significantly limit the feasibility of rigorous economic evaluation. Some data on outcomes are often included in monitoring and evaluation systems but information on costs is less likely to be captured in adequate ways.

Most programmes can provide data on annual programme expenditures, but are often missing information on what is included in the expenditures and do not distinguish between fixed and recurrent costs (the distinction is critical to assessing how costs may change as programme scales

[1] Reasoning with propositions whose truth or falsity is uncertain. To evaluate the probability of a hypothesis, the Bayesian probabilist specifies the probability, which is then updated in the light of new, relevant data.[http://en.wikipedia.org/wiki/Bayesian_probability]

up). For CBA, projections of long term benefits are often accomplished through modelling (described above). These projections often require using parameters from sources other than typical programme M&E data (e.g. various epidemiological parameters). Some of these parameters may vary among different regions or population groups. In the absence of region-specific data, some analyses may not be feasible.

This type of evaluation requires us to quantify information that is not easily quantified. This implies that we can only analyse measurable factors. Nevertheless, those factors that cannot be easily quantified may be important and should be considered. We may need to conduct qualitative evaluations to complement the economic evaluation and provide more in-depth guidance that will ultimately support the credibility of the economic evaluation and decisions made in that process.

The classical 10 point checklist developed by Drummond et al (1997) has been used as the basis for many more recent checklists. Additionally, more specialized checklists have been developed for judging quality of modelling studies. Programme managers can also use components of Drummond's checklist (presented below) or similar checklists during the early stages of economic evaluation to review evaluation protocol and guide discussions with relevant stakeholders to ensure adequacy of the proposed design.

Key Points. The economic evaluation framework – a 10-point checklist

1. Was a well-defined question posed in an answerable form?
2. Was a comprehensive description of the competing alternatives given?
3. Was the effectiveness of the programmes or services established?
4. Were all the important and relevant costs and consequences for each alternative identified?
5. Were costs and consequences measured accurately in appropriate physical units?
6. Were costs and consequences valued credibly?
7. Were costs and consequences adjusted for differential timing?
8. Was an incremental analysis of costs and consequences of alternatives performed?
9. Was allowance made for uncertainty in the estimates of costs and consequences?
10. Did the presentation and discussion of study results include all issues of concern to users?

Source: Drummond et al. (1997).

Economic evaluation forces the collection and quantification of information, such as costs, benefits, characteristics of interventions and programmes, and other variables. The decision-making and data gathering process needs to therefore be transparent and logical.

Useful Tip: Programme Managers should consider the following questions regarding data availability and access:

- Is monitoring of costs, benefits and the flow of money built into programme management, including the tracking of costs of different components?
- Would data from other programmes or government sectors be required for economic evaluation? If yes, is it feasible to obtain these data?
- Would special clearances and data sharing agreements be required? If yes, is the process for obtaining these fit within the expected timeline of the evaluation?

7.4 Ethical issues

DPME guidelines on ethics clearance and other ethics procedures for evaluation should be followed at all times. In conducting this evaluation, similar ethical issues of other evaluation processes include: duty of care, confidentiality, secure storing of data, and other research ethics.

Because of frequent data limitations, CBA often requires making a large number of assumptions. As long as these assumptions are fully disclosed and justified in a rigorous manner, using relevant evidence, this is an accepted practice. However, in an absence of relevant and applicable data, there is a risk of varying assumptions in a more arbitrary manner until a desired result is achieved. For this reason, evaluators should provide programme managers with a clear list of all assumptions (and their justification) that are being made early in the process. Any changes to initial assumptions should be disclosed and justified.

CEA and CBA is often about choosing a best alternative and could include making choices between different population groups. For example, the results of a CBA analysis can lead to a decision to fund a health programme directed at women rather than a programme directed at men. This decision will implicitly favour women's outcomes over men's outcomes. While this example is somewhat extreme, it illustrates the necessity of careful framing of economic evaluation questions and comparators. Some measures (e.g. years of lives saved or productivity measures) can favour certain sub-groups (e.g. younger people or more economically productive sub-groups). In such cases, it is crucial for the evaluator to provide programme managers with a detailed and transparent methodological plan, outline potential equity issues and their impact on results and conclusions. If impact is significant, alternate methodological approaches should be considered.

7.5 Trade-offs

First, it is only possible to incorporate a limited number of factors. Some factors, especially factors where only qualitative data can be meaningfully gathered, are often an important part of the decision-making process, but can be difficult to address in economic evaluation. Second, while generally prospective (or ex-ante) studies are preferred to retrospective (or ex-post) studies, because of their ability to incorporate collection of all relevant information, prospective studies can also be costly and time-consuming. Retrospective studies are less costly and more rapid but rely mostly on secondary data which may or may not be adequate to robustly answer evaluation questions. Retrospective data collection is relatively common for economic evaluations as it relies on various programme financial, accounting and human resource records as data sources for cost determination.

Useful Tip:
In planning timing of the study, remember that sometimes there are long lags between the time the cost is incurred and the time this cost is actually reflected in accounting or financial records.

8 Typical costs

This section provides some basic guides for helping to determine the size of an evaluation budget. However each context will be unique and require specific budgeting discussions and decisions. The programme manager has a key role in ensuring that the scope of what is promised by evaluators, or expected by the programme manager, is realistic for the amount budgeted; as over ambitious and under budgeted scope of work is likely to yield a weak base of evidence and an unused report.

Budgeting for an evaluation is dependent on numerous factors. A general 'rule of thumb' is that an evaluation should be between 0.1% to 5% of an intervention's budget. However this depends on many variables, such as the size of budget, with large programmes needing proportionally less, the amount of credible data already collected, the timeline to collect data, the amount of field work that needs to be done, and other contributing cost factors.

Another common guidance is that 5% and 15% of total programme budget should be set aside for monitoring and evaluation (M&E), or 3-10% of annual budget. However this refers to M&E rather

than evaluation specifically; and it is likely in many programmes that routine monitoring will consume most of the M&E budget.

Additional resources for economic evaluation may be required if:

- Systematic literature reviews need to be conducted to identify parameters to be used in economic evaluation
- Complex modelling is needed to adequately project impacts
- Primary data on costs or outcomes need to be collected

Signed

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Date: 31 March 2014

Annex 1: Glossary

Cost-benefit analysis	Refers to a systematic process for calculating and comapring benefits and costs of a project decision or government policy.
Cost-effectiveness analysis:	This is a form of economic analysis that compares the relative costs and outcomes of two or more courses of action.
Cost-utility analysis:	This a form of financial analysis for the analysis of health-related effects. This measures a programme's effect on both quantitative and qualitative aspects of health (morbidity and mortality), using a utility based measure such as quality adjusted life years (QALYs).
Decision analysis:	This is the application of explicit and quantitative methods to analyse decision under conditions of uncertainty.
Discount rates:	Refers to the rate at which a bill of exchange or an accounts receivable is paid (discounted) before its maturity date
Economic Analysis:	The viability of projects based upon economic and social improvements and not financial bankability
Effect:	Intended or unintended change due to directly or indirectly due to an operation. These chnges can be the output, outcome and impact levels.
Equity	Refers to how the benefits and costs of interventions are distributed across population groups.
Multi-Criteria decision Analysis:	is a sub-discipline of operations research that explicitly considers multiple criteria in decision-making environments.
Public Expenditure Tracking Survey:	is a quantitative survey of the supply side of public services.
Relevance:	The extent to which the objectives of an operation are consistent with beneficiaries needs, country needs, organizational priorities and partners and donor policies.
Result Based Management:	A management strategy focusing on performance and achievement of outputs, outcomes and impacts.
Return on Investment:	is the concept of an investment of some resource yielding a benefit to the investorTrade-offs: is a situation that involves losing one quality or aspect of something in return for gaining another quality or aspect

Annex 2: Useful Web Resourses

Bayesian probability -	http://en.wikipedia.org/wiki/Bayesian_probability
National Evaluation Policy Framework	http://www.thepresidency-dpme.gov.za

Annex 3: References and Resources

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Annex 4: Extract from National Treasury Capital Planning Guidelines 2014 (p8-10)

6.2.1 Cost Benefit Analysis

Different methodologies are available for analysing the economic viability of a project; the most common one is the Cost Benefit Analysis (CBA). A CBA seeks to establish whether a particular investment is the most efficient use of society's resources. It does this by identifying and monetising the costs and the benefits to society to enable comparison. A CBA identifies and monetises every direct impact and predicts the timing thereof over the same horizon as the asset's economic lifetime. This is best presented as benefits on an annual basis. These values are then discounted back to their present values using a social discount rate. Every preferred option will be subject to this approach. The result will then be a comparison of every option with the base case "do-nothing" scenario and a ranking of the different options in accordance to their net welfare benefit to society. The result of a CBA is best reported in the form of an Economic Net Present Value (ENPV) which are the costs subtracted from the benefits or in the form of a Benefit-Cost Ratio (BCR) which is the ratio of the benefits over the costs. A project that will benefit the country will have an ENPV larger than zero and a BCR larger than one.

6.2.2 Cost Effectiveness Analysis

Cost-effectiveness studies are appropriate where project options must be compared but assigning a monetary value to the desired outcome would not be appropriate. This usually applies to projects that do not represent an economic activity, such as social, health or human rights projects, and where a needs analysis has been informed by a defined social requirement. Decision-making in these cases is focused on finding the solution that is the most efficient in realising the desired project outputs, and the results of the studies are therefore expressed as a ratio (cost per 'unit' of benefit). The cost-effectiveness analysis analyses the costs of a project in exactly the same manner as a CBA. However, the benefits are described in a very specific non-monetised way such as 'number of HIV tests conducted' or 'number of lives saved per year' or 'number of children vaccinated'. The results are then presented as the cost per 'unit' of benefit (1 HIV test, 1 life saved, or 1 child vaccinated). The project with the best ratio is the one with the optimal scale that uses the resources the most efficiently. In certain occasions however, there is a particular threshold (minimum of 10.000 vaccinations) that needs to be reached before comparing projects on the efficiency ratio. The cost-effectiveness analysis allows institutions to assess projects without having to monetise social benefits.

6.2.3 Economic Impact Assessment

Once the viability of one or more project options has been demonstrated through cost-benefit analysis or cost-effectiveness analysis, it may be necessary to do further analysis to identify the macro-economic growth effects, spill-over effects, or distributional impacts. If the proposed project is so large, capital intensive or import reliant that it might influence national or sectorial GDP, the balance of payments or the exchange rate, a macro-economic impact assessment is required. If the project has the potential to affect a particular social group, a region or a sector, a micro-economic impact assessment is required. The assessment allows for the identification of the losers and the winners from the project and the judgement of whether these distributional impacts are aligned with government priorities. If the potential losers are identified as an already vulnerable group, this might require mitigation actions to be undertaken. The project's scope and financial structure must be aligned towards the findings in the impact assessment. The results of these impact assessments can assist in prioritising viable projects on the basis of other developmental goals such as impact on rural or regional development, industrial expansion, potential for job creation or losses, or reduction in inequality; or for large projects, and their impact on exchange rates, balance of payments, inflation, and GDP growth. Methodological tools for analysing these impacts are Social Accounting Matrices (SAMs), Input Output tables (I/O), Computable General Equilibrium models (CGE) and simple surveys and public consultation.

6.3 Risk assessment and sensitivity analysis

The outcomes of both the financial and economic analysis are based on certain modelling assumptions and risk predictions. These assumptions need to be scrutinised and tested to ensure that the project remains viable even in an environment which differs significantly from that assumed in the various analyses conducted.

Large projects with significant technical, financial and economic risk are required to undergo a qualitative as well as quantitative risk assessment. Smaller projects with limited technical or contextual risk, must attempt to draw up a risk matrix where all the potential risks are listed and the likelihood and impact of the identified risk on the project is qualitatively described and controls or mitigating actions identified.

A risk assessment looks at all risks related to a project and assesses the impact of these risks and if mitigating actions are possible. For certain projects where uncertainty is significant and involves large financial risks, presenting a riskadjusted costing model is crucial. Costing for risks is then undertaken by identifying all the risks, approximating the financial impact they will have on project costs and revenues and estimating the probability of occurrence of the risk event. A sensitivity analysis tests the impact of changes in various modelling assumptions on the viability of the project. After the financial model has been finalised, sensitivity analyses need to be undertaken in order to determine the resilience of the cash flows to changes in assumptions over the project's

life-cycle. Adjusting each variable individually by a given percentage and then stress-testing project viability will highlight which assumptions are the most vulnerable. The impact of changes in these assumptions on the FNPV and ENPV should be determined.

Annex 5: Steps in a MCDA process

1. Establish the decision context that includes, but is limited to the MCDA aims, decision makers and key players.
2. Identify the programmes.
3. Identify the objectives and attributes (i.e., quality or features of programmess) to be assessed.
4. Determine criterion for each attribute (usually one-to-one mapping and can be used interchangeably):
   - Quantitative or qualitative attributes (e.g., price of a car, comfort rating)
   - Mixtures of units for quantitative measures (price and weight)
   - Organize criteria by grouping into high-level and lower-level objectives in a hierarchy
5. Weight each criterion to reflect relative importance to decision.
6. Score the expected performance of each programme against the criteria:
   - Assess value of the expected outcome of each programme for each criterion.
7. Create an overall score for each alternative using weights and individual scores:
   - May use performance matrix to compile results.
   - Each row of the performance matrix describes the intervention. Each column describes the performance of the intervention against each criterion.
8. Determine the highest scoring alternative or alternative that dominates others.
9. Sensitivity analysis: Use a probability sensitivity analysis:
   - Determine if including other preferences or weights changes the programme order ;
   - Analyse the advantages and disadvantages of selected programmes to determine if new interventions can be included.

Steps 1-4 above are similar to steps for MCDA or CBA. CBA involves (1) determining then valuing the impact of a programme and (2) calculating the costs of implementing the intervention. CBA values in monetary terms and then chooses the most efficient programme. (The weighted component of the MCDA is done in CBA analysis but by transforming values into monetary terms instead of weighted values.)