



# June 2018: Program Evaluation Workshop

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# Welcome and introduction



# Objectives



At the completion of this interactive workshop you will be able to:

- Describe the **rationale** underpinning program evaluation
- Understand the interaction between a program evaluation and **clinical research**
- Identify and apply the steps for developing the **key evaluation question** and aligning this to your program evaluation within your project plan
- Identify **outputs** and **outcomes** for the program evaluation within your project plan, as they relate to process objectives and impact objectives
- Identify principles of **health economics** and apply these principles to develop an economic evaluation within the program evaluation within your project plan
- Apply the components of a program evaluation to a **program logic model** within your project plan



# Agenda

## Welcome and introduction

### **Presentation:** What is a program evaluation and why evaluate?

- Breakout session: Developing the key evaluation question for the program evaluation within your project plan

### **Presentation:** Aligning the key evaluation question to the subsequent model of program evaluation

- Breakout session: Outputs and outcomes; what to measure, the data source, method of data collection and timeframes for the program evaluation within your project plan

### **Presentation:** Principles of health economics

- Breakout session: Develop an economic evaluation as part of the program evaluation within your project plan

### **Presentation:** Program logic model

- Breakout session: Build a program logic model within your project plan

**What is program  
evaluation and why  
evaluate?**



# What is a program evaluation?



“A systematic process designed to examine the worth of a program or project in terms of effectiveness, efficiency and appropriateness”

NSW Agency for Clinical Innovation, Owen, 2007

## Why evaluate?



Program evaluations can solve problems

Program evaluations can inform decision making

Program evaluations can build knowledge

# Program evaluation is a part of a continuum



Program evaluation is a part of quality improvement and research



Program evaluation is a part of translational research



Khoury MJ, Gwinn M, Ioannidis JP. The emergence of translational epidemiology: from scientific discovery to population health impact. *American journal of epidemiology*. 2010 Aug 5;172(5):517-24.



# Approaches to program evaluation: Formative, Process and Summative



Formative evaluation: usually informs the project objectives

- Assesses program design, early implementation and associated outcomes
- Often an evaluation for a pilot program / model of care
- Generally undertaken before a program is implemented across a health system
- Can include undertaking a needs assessment & this can include:
  - Gaps in practice: what needs to change & why (EBP & data)
  - Barriers and facilitators: what is blocking the change

# Approaches to program evaluation: Formative, Process and Summative (cont.)



Process evaluation: usually informs the project objectives

- To determine the extent to which a program is being implemented according to plan
- It is imperative to distinguish between a defective program and a defective implementation strategy
- Data from the formative evaluation may impact the process evaluation, for example:
  - The process evaluation will measure the reduction of gaps in practice (what needs to change) and reduction in barriers (what is blocking the change)

## Approaches to program evaluation: Formative, Process and Summative (cont.)



Summative evaluation: usually informs the overarching goal

- Assessment of the quality, outcomes and outputs of the model of care and this is usually done at the completion of the project
- Outcome evaluation: this includes changes in health and economic outcomes
- Impact evaluation, this is the overall impact of a program, either intended or unintended

## An evaluation needs to answer a question



Key evaluation question for the project goal:

- With reference to the project goal stated in Section 2.1, pose the key evaluation question in the context of determining if the project goal has been achieved.

Key evaluation questions for the project objectives (**SMART**: **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-bound):

- With reference to each of the project objectives stated in Section 2.2, pose the key evaluation questions in the context of determining if the project objectives have been achieved.

For each goal (2.1) and objective (2.2), there is a corresponding evaluation question (5.1 and 5.2)

## An evaluation needs to answer a question (continued)



So lets take a step backwards to specify the goal and the objectives of the project

- 2.1 in the project plan: What is the overall goal of the project? Consider the impact you want to achieve by the conclusion of the project.

*One overarching goal*

- 2.2 in the project plan: What are the project objectives? Consider the steps that are required to achieve the project goal. These can be broken down into (but not limited to).....

*Five to ten project objectives*

## **An evaluation needs to answer a question (continued)**



### **Process objectives (formative and process evaluation)**

Planning: The objective is to prepare for implementation and governance of the project which includes completing the following tasks .....

- Develop a detailed project implementation plan; develop a Gantt chart of events and timelines; identify gaps between current service and the new model of care; identify barriers and facilitators; obtain baseline data; establish new targets; complete staff recruitment; engagement of key stakeholders; develop communication strategies to those impacted by the project; prepare process forms, documents, and data collection forms; consider ethics approval; identify risks, assumptions, issues and dependencies; etc.

Implementation: The objective is to action the project implementation plan which includes completing the following tasks ... consider the tasks noted in the point above in the planning sub-section

# An evaluation needs to answer a question (continued)



## Impact objectives (summative evaluation)

Monitoring and review: The objective is to determine the following.....

- The extent to which the project was able to achieve the intended short, medium and long term goals with respect to outputs and outcomes;
- How the outcomes of the project demonstrate value for money, that is, the economic impact; consider re-admissions when hospital admission is avoided or LOS is reduced;
- The extent the project was able to reach the intended participants;
- The extent to which the project was able to increase the target audiences awareness and knowledge of the project.

## **An evaluation needs to answer a question (continued)**



### **Impact objectives (summative evaluation cont.)**

Sustainability and generalisability: The objective is to determine the following.....

- The extent to which sustainability measures have been implemented;
- Recommendations for the extent to which the project can be implemented into other settings (within the same health service or into other health services)



## How to structure the key evaluation question



**PROJECT GOAL:** “To reduce general medical admissions to the health service via the emergency department by 20% by introducing a community based nursing and allied health model of care, without increasing the rate of health service re-admission”

**KEY EVALUATION QUESTION:** “Does the introduction of a community based nursing and allied health model of care reduce general medical admissions to the health service via the emergency department by 20%, without increasing the rate of health service re-admission?”

## How to structure the key evaluation question (continued)



### ELEMENTS:

- Model of care
- Patient population
- Primary outcome / output: consider direction & quantify
- Timeframe: consider setting & follow-up period
- Evaluation perspective

“Does the introduction of a community based nursing and allied health model of care (model of care) reduce general medical admissions (patient population) to the health service (perspective) via the emergency department (timeframe) by 20% (primary outcome quantified with direction) without increasing the rate of health service re-admission (secondary outcome)?”

# Breakout session



## 5. Project evaluation

### 5.1 Key evaluation questions for the project goal:

*With reference to the project goal stated in Section 2.1, pose the key evaluation question in the context of determining if the project goal has been achieved.*

### 5.2 Key evaluation questions for the project objectives:

*With reference to each of the project objectives stated in Section 2.2, pose the key evaluation question in the context of determining if the project objectives have been achieved.*

ELEMENT	YOUR PROJECT PARTICULARS
Model of care	
Patient population	
Primary outcome / output: consider direction & quantify	
Timeframe: consider setting & follow-up period	
Evaluation perspective	

**Aligning the key  
evaluation question to  
the subsequent  
evaluation framework**



# Evaluation framework

## 5.3 Evaluation framework

Determine the measures that are required to evaluate the success of your project. Consider a wide range of quantitative and qualitative measures. The evaluation framework should be aligned to the key evaluation questions for the project goal (5.1) and project objectives (5.2). If required, key evaluation questions for the project goal and project objectives can be broken down into multiple smaller measures in this evaluation framework. Remove / add rows as necessary.

Key evaluation question	Outcome measure(s)	Data Source(s)	Method(s) of data collection; include data collection tools, if appropriate	Person(s) responsible for data collection	Timeframes	Outputs and / or outcomes



- Determine the measures that are required to evaluate the success of your project. Consider a wide range of quantitative and qualitative measures.
- The evaluation framework should be aligned to the key evaluation questions for the project goal (5.1) and project objectives (5.2).
- If required, key evaluation questions for the project goal and project objectives can be broken down into multiple smaller measures in this evaluation framework.

## Evaluation framework (continued)



Measures: need to reflect the goal and the objectives

- Formative (measures objectives): degree of agreement between gold standard and actual program design (guidelines for study types <https://www.equator-network.org/>); quantify gaps between current program and accepted best practice / CPGs (Guidelines International Network <http://www.g-i-n.net/home>); barriers and facilitators to implementation
- Process (measures objectives): degree of agreement between planned and actualised implementation plan; quantify the components that have been delivered; the degree the program is reaching the target population; change in efficiency; change in effectiveness; staff and patient satisfaction



## Evaluation framework (continued)

- Summative (measures the goal): patient specific outcomes such as health status, quality of life, ability to self-manage, etc; health service outcomes such as unplanned re-admissions, length of stay (outcomes), as well as reduced waiting list, patient throughout (outputs)
- Summative can also consider broader impacts (intended or unintended): measure change in staff knowledge and awareness as well as change in staff and patient behaviour, measure if the needs of those served by the program have been achieved, measure if the program been cost effective....

## Evaluation framework (continued)



### Data Sources

- Health service data base systems: administrative systems for admission data, governance and finance (HIS & BDU); patient systems for health service utilisation and results; patient systems for communication
- Benchmarking databases: AROC; NSF; Cardiac Registry
- Research databases: clinical trials registry e.g. ANZCTR; Cochrane's database <http://www.cochrane.org/>; Google Scholar
- Centralised health records: Medicare and PBS
- Localised data sources specific to the program evaluation: patient measures for health, wellbeing, QOL, burden, etc.





## Evaluation framework (continued)

Methods of data collection; include data collection tools if appropriate

- May require HREC approval from an ethical perspective and some require subscription, e.g. clinical registry
- May require health service key stakeholder engagement prior to project approval (e.g. head of HIS, BDU)
- May require knowledge of the literature to ensure valid and reliable tools are used
- Some data collection tools will need to be purpose built for the program evaluation
- In addition, consider who will do this, when, at what cost, etc.

## Evaluation framework (continued)



### Timeframes

- Retrospective
- Prospective: consider the start point as the point of admission may not always apply; consider the end point as it is not always at the point of discharge from the service
- Follow-up

## Evaluation framework (continued)



Outputs and / or outcomes (not to be confused with inputs or activities)

- Inputs: resources dedicated to, or consumed by, the program
- Activities: what the program does with inputs to fulfil its mission
- Outputs (often relates to quantity): the direct products of program activities such as patient throughput, number of patients accessing the program, number of staff trained, number of procedures
- Outcomes (often relates to quality): benefits of changes in a population of interest such as change in health state



# Principles of health economics



# Principles of health economics



Economic Evaluation Cheat Sheet 2018  
Dr Tash Brusco

## Introduction to an Economic Evaluation: analysing the cost and the effect of a program

	Comments / prompts	Apply to your program evaluation				
Program alternates	What are the program alternates?					
Program effect	Which outcome will define the "effect"? E.g. per surgery / fall avoided? Per gain in function / QOL? Per adherence to protocol?					
Program costs and units	What are the different "units" that make up the cost of program? Define each unit Unit cost (reference this)	EG Unit: Acute admission 1 day LOS \$600 AUD	Unit 1:	Unit 2:	Unit 3:	Unit 4:
	Collect data on the average number of units for program alternate 1 (per participant)	10 days				
	Average number of units x unit cost = average total cost of unit for program alternate 1 (per participant)	10x\$600 = \$6,000				
	Collect data on the average number of units for program alternate 2 (per participant)	8 days				
	Average number of units x unit cost = average total cost of unit for program alternate 2 (per participant)	8x\$600 = \$4,800				
Type	Cost minimization? Cost effectiveness? Cost utility? Cost benefit?					
Perspective	Health service? Health system? Program?					
Timing	Do you need to adjust the cost for timing (inflate / discount)?					
Adjust for risk	Do you need to do a sensitivity analysis or to model the data?					
Make a decision	Is there a cutoff point in the economic evaluation to assist decision making? Who makes the decision?					
The question	Define your economic evaluation question (consider including): <input type="checkbox"/> type of evaluation <input type="checkbox"/> program alternates <input type="checkbox"/> the outcome to define effect <input type="checkbox"/> perspective	"Is it cost-effective (type) to introduce a community based nursing and allied health model of care (alternate 1) to reduce general medical admissions (alternate 2) to the health service (perspective) via the emergency department per health service re-admission avoided (effect)?"				

**Table 2 – CHEERS checklist—items to include when reporting economic evaluations of health interventions.**

Section/Item	Item no.	Recommendation	Reported on page no./line no.
Title and abstract			
Title	1	Identify the study as an economic evaluation, or use more specific terms such as "cost-effectiveness analysis" and describe the interventions compared.	
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analysis), and conclusions.	
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study. Present the study question and its relevance for health policy or practice decisions.	
Methods			
Target population and subgroups	4	Describe characteristics of the base-case population and subgroups analyzed including why they were chosen.	
Setting and location	5	State relevant aspects of the setting(s) in which the decision(s) need(s) to be made.	
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefits in the evaluation and their relevance for the type of analysis performed.	
Measurement of effectiveness	11a	Single study-based estimates: Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	
	11b	Synthetic-based estimates: Describe fully the methods used for the identification of included studies and synthesis of clinical effectiveness data.	
Measurement and valuation of preference-based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	
Estimating resources and costs	13a	Single study-based economic evaluation: Describe approaches used to estimate intervention valuations.	
	13b	Model-based used to estimate resources: Describe resources made to estimate intervention valuations.	
Currency, price date, and conversion	14	Report the currency used to estimate costs and outcomes.	
Choice of model	15	Describe the model used to estimate costs and outcomes.	
Assumptions	16	Describe all decisions and assumptions used in the model.	
Analytic methods	17	Describe all methods used to estimate costs and outcomes, including any extrapolation, imputation, or model uncertainty.	
Results			
Study parameters	18	Report the values, ranges, references, and if used, probability distributions for all parameters. Report reasons or sources for distributions used to represent uncertainty where appropriate. Providing a table to show the input values is strongly recommended.	
Incremental costs and outcomes	19	For each intervention, report mean values for the main categories of estimated costs and outcomes of interest, as well as mean differences between the comparator groups. If applicable, report incremental cost-effectiveness ratios.	
Characterizing uncertainty	20a	Single study-based economic evaluation: Describe the effects of sampling uncertainty for estimated incremental cost, incremental effectiveness, and incremental cost-effectiveness, together with the impact of methodological assumptions (such as discount rate, study perspective).	
	20b	Model-based economic evaluation: Describe the effects on the results of uncertainty for all input parameters, and uncertainty related to the structure of the model and assumptions.	
Characterizing heterogeneity	21	If applicable, report differences in costs, outcomes, or cost-effectiveness that can be explained by variations between subgroups of patients with different baseline characteristics or other observed variability in effects that are not reducible by more information.	
Discussion			
Study findings, limitations, generalizability, and current knowledge	22	Summarize key study findings and describe how they support the conclusions reached. Discuss limitations and the generalizability of the findings and how the findings fit with current knowledge.	
Other			
Source of funding	23	Describe how the study was funded and the role of the funder in the identification, design, conduct, and reporting of the analysis. Describe other nonfinancial sources of support.	
Conflicts of interest	24	Describe any potential for conflict of interest among study contributors in accordance with journal policy. In the absence of a journal policy, we recommend authors comply with International Committee of Medical Journal Editors' recommendations.	

Note: For consistency, the CHEERS statement checklist format is based on the format of the CONSORT statement checklist.

Husereau D, Drummond M, Petrou S, Carswell C, Moher D, Greenberg D, Augustovski F, Briggs AH, Mauskopf J, Loder E, ISPOR Health Economic Evaluation Publication Guidelines-CHEERS Good Reporting Practices Task Force. Consolidated health economic evaluation reporting standards (CHEERS)—explanation and elaboration: a report of the ISPOR health economic evaluation publication guidelines good reporting practices task force. Value in Health. 2013 Apr 30;16(2):231-50.

# Principles of health economics (continued)



Stages of the evaluation

Four main types

Different perspectives

Measuring and valuing resources

Timing

Analysis and reporting of the data

Modelling and sensitivity analysis

# Principles of health economics: stages of the evaluation



1. Study question including statement of alternate interventions
2. Assessment of cost and effect of alternates
  - Listing costs (resources) and effects
  - Measuring costs (resources) and effects
  - Valuing costs (resources) and effects
3. Adjustment for timing (inflate / discount)
4. Adjusting for risk: internal and external validity (modelling / sensitivity analysis)
5. Making a decision: decision rules e.g. willingness to pay threshold, cost effectiveness acceptability curve, net present value, incremental cost effectiveness ratio etc.



# Principles of health economics: four main types



## Cost minimisation

- Different to cost analysis (partial evaluation)
- Monetary units with assumed equal effect

## Cost effectiveness

- Incremental cost effectiveness ratio
- Ratio of monetary units to a single effect of interest

## Cost utility

- Incremental cost effectiveness ratio
- Ratio of monetary units to a effect of life satisfaction (commonly QOL)

## Cost benefit

- Monetary units combined with effect(s) that have been valued in monetary units (consider other sectors, e.g. justice & education)

# Principles of health economics: perspectives



Health service

Payer perspective (private health insurance)

Patient / family

Health system

Societal

# Principles of health economics: measuring and valuing



Need to capture all relevant resources

- This is influenced by the perspective
- Health resources versus non-health resources

Measuring the resources

- Use of appropriate units
- Administrative data sets (e.g. Medicare, PBS, Health Service)
- Self-reported (e.g. via a diary, a questionnaire, etc.)

# Principles of health economics: measuring and valuing (continued)



## Valuing the resources

- Need to justify choice

The economic evaluation must report for each resource; what is a unit, cost per unit and unit utilisation

Consider the resources in the context of the effect

- Cost effectiveness to establish the incremental cost and the incremental effect, for the incremental cost effectiveness ratio (ICER)

# Principles of health economics: timing



Intervention only timeframe

Consider upstream and downstream costs

- For example the waiting list period or the follow up period
- Be aware of recall bias with follow up that requires retrospective recall of health service utilisation

Adjustment of costs for timing

- Awareness that costs need to be inflated / deflated to a common period of time to represent a Net Present Value (NPV)
- Consider this when data collection extends across one financial year

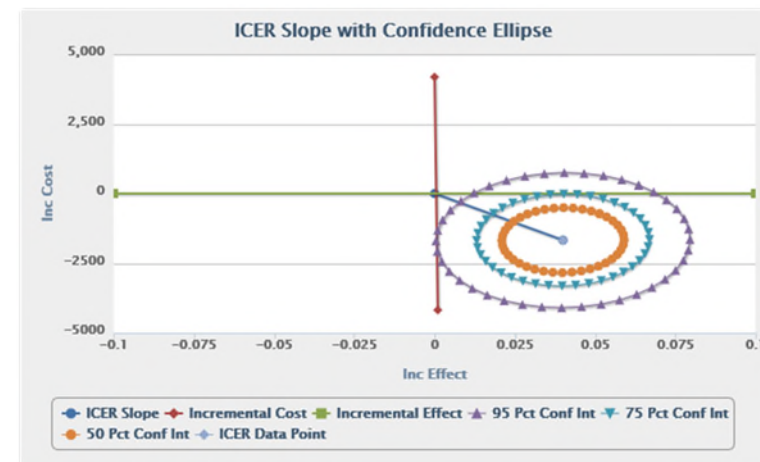
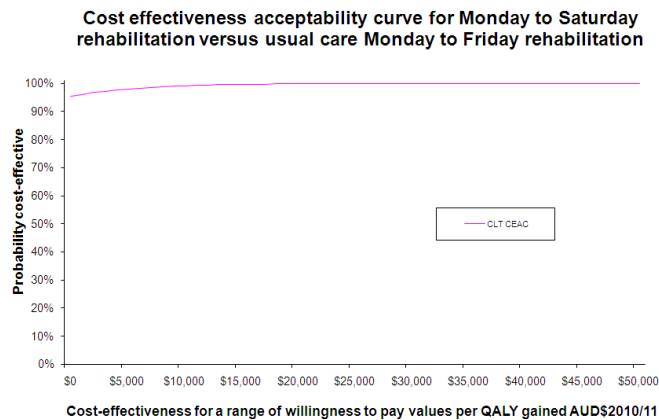
# Principles of health economics: analysis and reporting of the data



Cost data: presented in isolation

Effect data: presented in isolation

Combined cost and effect data: for example incremental cost effectiveness ratio (ICER) or the cost effectiveness acceptability curve (CEAC)



Brusco NK, Watts JJ, Shields N, Taylor NF. Are weekend inpatient rehabilitation services value for money? An economic evaluation alongside a randomized controlled trial with a 30 day follow up. BMC Medicine. 2014 May 29;12(1):89.



## Program logic model





## Program logic model



Completed as the final step to summarise and bring together the inputs, activities, outputs and outcomes identified in the program evaluation

The program logic can:

- Document connections between the input, activity, output and outcomes
- Assist in maintaining a focus on outcomes for the program

## Program logic model (continued)



To re-cap from the previous section:

- Inputs: resources dedicated to, or consumed by, the program
- Activities: what the program does with inputs to fulfil its mission
- Outputs (often relates to quantity): the direct products of program activities such as patient throughput, number of patients accessing the program, number of staff trained, number of procedures
- Outcomes (often relates to quality): benefits of changes in a population of interest such as change in health state



# Follow up support for your Program Evaluation



Each health service will have access to a 1:1 follow up session with myself to review your Program Evaluation.

If you choose to access this support these are the expectations:

What is expected of you	What is expected of me
You will contact me (email or phone) to set up a follow up session and together we will determine an agreed day and time	Once contacted for a follow up session, I will set up a ZOOM meeting (video-conference) and email you an invitation with an e-link
You will email me your project plan (project evaluation included) 48 hours prior to the follow up session	I will complete a review of your program evaluation prior to the follow up session
You will openly consider the feedback provided during the follow up session	I will provide written and verbal feedback during the follow up session
You are welcome to contact me (email or phone) if you have further questions	I will welcome additional contact if you have further questions

**Please complete a brief survey via:**

**<https://PollEv.com/surveys/E5ubRWZ46/web>**

**Thankyou!**

**Contact details:**

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