

BANFF, CANADA September 7–11, 2014

The International School on Research Impact Assessment

Define Indicators of Success

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September 9, 2014

Hosted by:



In partnership with:



Learning outcomes

- **Understand** how to best generate indicators, including selecting a balanced set of key indicators
- **Select** indicators that link to impact categories of interest to stakeholders
- **Select** key success indicators that can answer the specific assessment questions



Overview



1. Different types of indicators
2. Use the logic model as a tool for identifying indicators
3. Review programme context considerations
4. Review the science behind indicator selection



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Measurement

*“What gets
measured gets
done”*

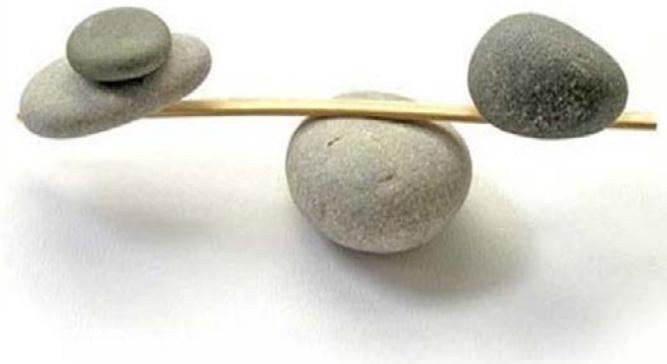


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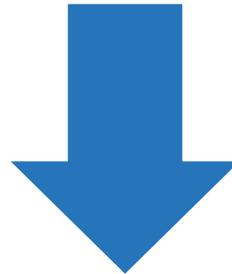
Indicators of success

- Establish the evidence to answer stakeholder questions about the programme performance
- Can tell a brief, convincing performance story about what the programme has (not) achieved, especially when a balanced set of indicators is used



Assessment Questions

What do stakeholders want to know?



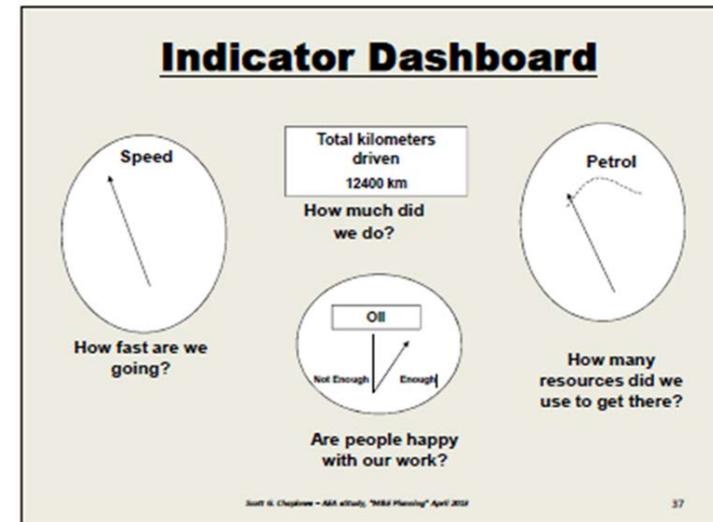
Indicators

How will we know it?



Indicators

- An indicator is a variable that measures a phenomenon of interest*
 - Quantitative indicators have a unit of measure (*metrics*)
 - I.e., a number, percent, ratio, etc.
 - Indicators can also be qualitative
 - E.g., the extent to which a programme is improving



Types of indicators

- Indicators can be either leading or lagging

A leading indicator gives a signal BEFORE the new trend or reversal occurs.

A lagging indicator gives a signal AFTER the new trend or reversal occurs.



Characteristics of leading indicators

- Input oriented
- Hard to measure
- Easy to influence
- E.g., daily referral volumes

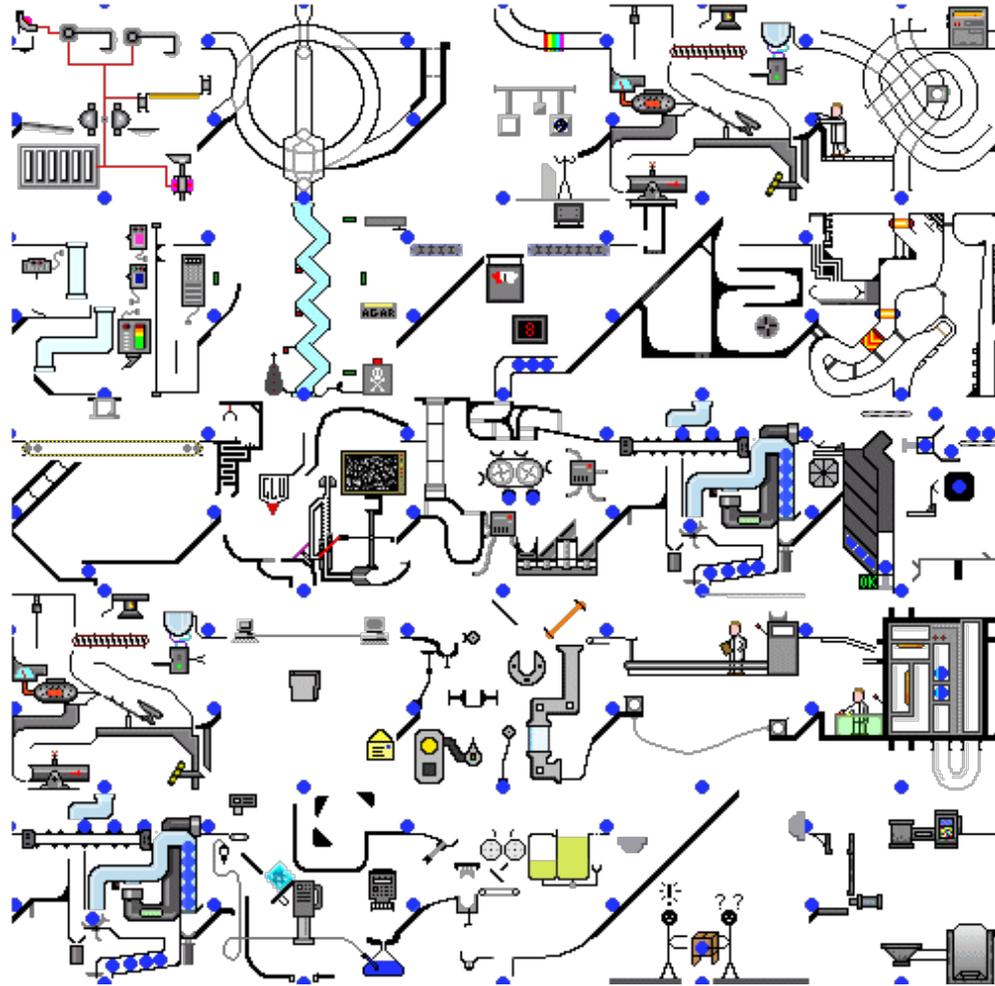
Characteristics of lagging indicators

- Output oriented
- Easy to measure
- Hard to influence or improve
- E.g., average referral to admission cycle times



USING THE LOGIC MODEL AS A TOOL FOR IDENTIFYING INDICATORS

Programme as a system



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Criteria for success

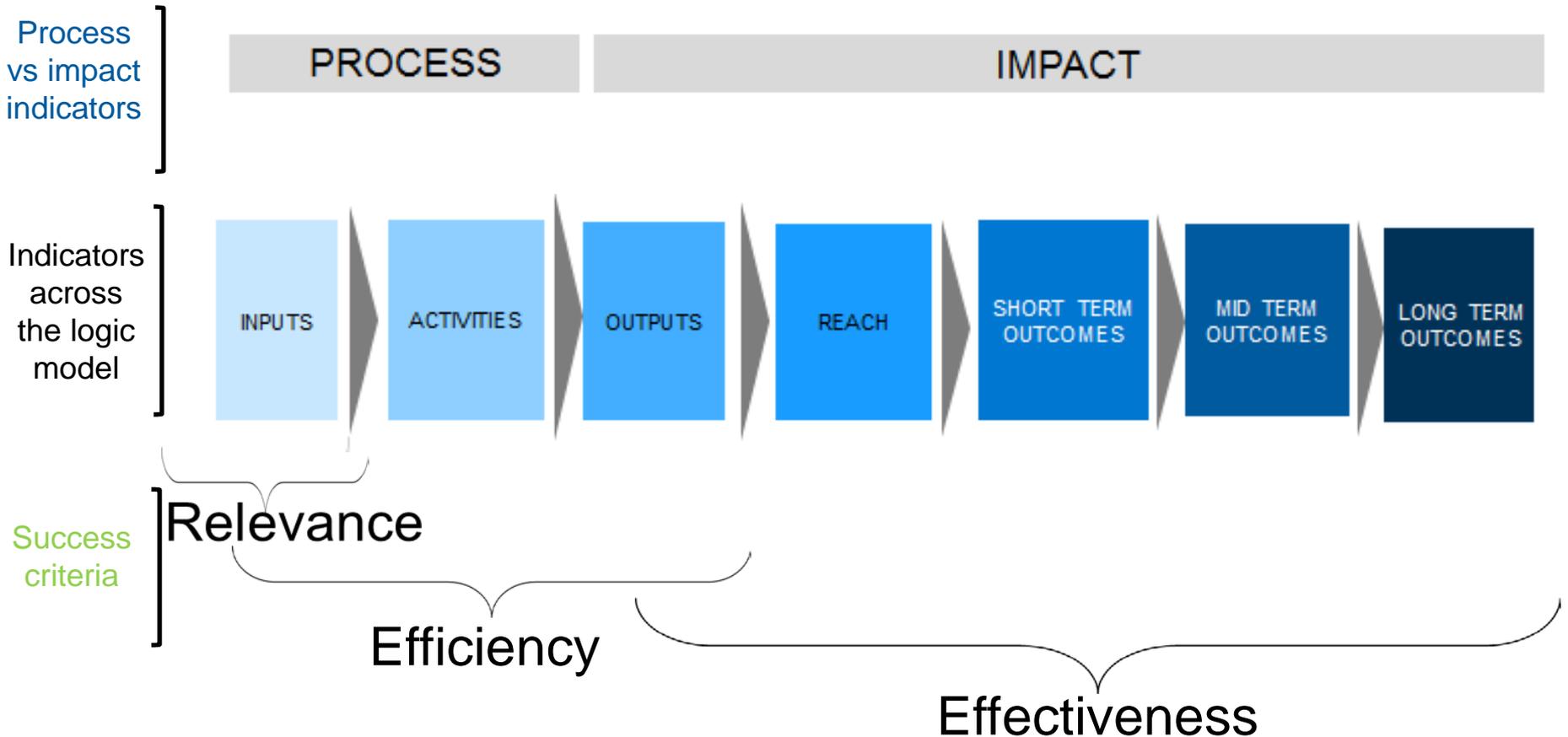
- Relevance
- Efficiency
- Effectiveness
- Excellence
- Quality



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Logic model and indicators



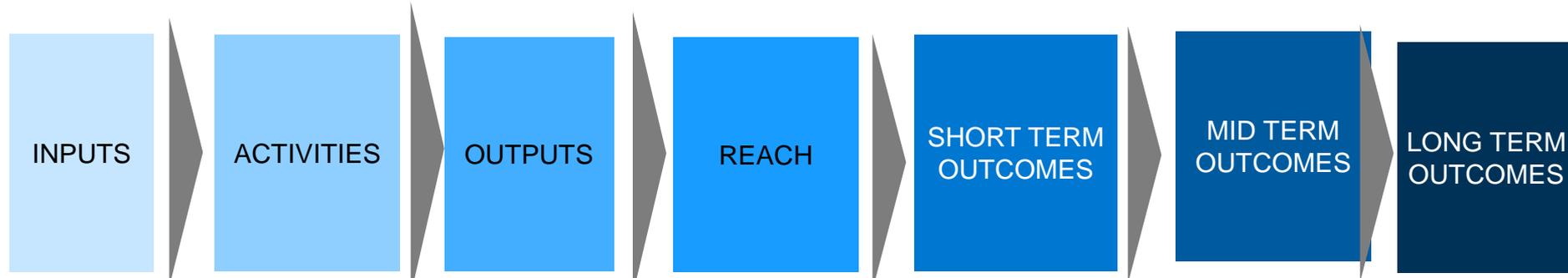
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Questions and Indicators across the logic model

Example



Example of Questions

- | | | | | | | |
|--|--|--|---|--|--|---|
| <ul style="list-style-type: none"> •What amount of \$ and time were invested? | <ul style="list-style-type: none"> •How many mentorship sessions were held? •Quality of training sessions? | <ul style="list-style-type: none"> •How many attended or did not attend sessions? •Did they attend all sessions? | <ul style="list-style-type: none"> • Who did the programme reach? • Did the programme reach a broad audience? | <ul style="list-style-type: none"> •To what extent did knowledge, skills , attitudes increase? •What else haappened? | <ul style="list-style-type: none"> •To what extent did behaviors and prpractice change? •What else happened? | <ul style="list-style-type: none"> •To what extent did mentees improve? •Did mentees have better career prospects than mentees? |
|--|--|--|---|--|--|---|

Example of Indicators

- | | | | | | | |
|--|---|---|--|--|---|--|
| <ul style="list-style-type: none"> •# Staff •Costs | <ul style="list-style-type: none"> •# Sessions held •Quality criteria | <ul style="list-style-type: none"> •#,% attended per session •Certificate of completion | <ul style="list-style-type: none"> • # and type of mentees reached • # of website hits | <ul style="list-style-type: none"> •#,% demonstrating increased knowledge/skills, attitudes •Additional outcomes | <ul style="list-style-type: none"> •#,% demonstrating changes •Types of changes | <ul style="list-style-type: none"> •#,% demonstrating improvements •#/% employed |
|--|---|---|--|--|---|--|

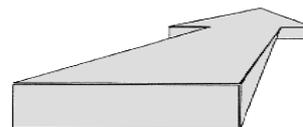
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Sequence of programme outcomes

Social-economic-
environmental improvements



Actions

E.g., Changes in behaviors and practices

Learning

E.g., Changes in knowledge, attitudes, skills, aspirations

Reactions

E.g., Degree of satisfaction with program; level of interest; feelings toward activities; educational methods

Participation

E.g., Number and characteristics of people reached; frequency and intensity of contact

PRACTICAL CONSIDERATIONS FOR GENERATING INDICATORS

Focus of the assessment

- Assessment purpose
- Impacts of interest to the stakeholders
 - Impact categories of interest within a selected framework
- General and specific assessment questions of primary interest to the stakeholders



Learning activity

Work in groups at your table, use the indicators from the Block 3, Session 2, Exercise 1 envelope and follow the instructions:



1. Agree on what indicators best map to the 5 impact categories
2. Discuss in your group
 - Why indicators selected are the best for each category
 - Rationale for why you removed any specific indicators

(10-15 minutes)



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Programme contextual factors

- Level of application
- Programme maturity and focus
 - New → mature
 - Formative → summative assessment
- Time lag from research to achieve wider impact
- Programme attribution/contribution

Research system

Field

Institution

Department or programme

Research group

Project

Researcher

Source: Measuring Research: A guide to research evaluation frameworks and tools. Rand-Europe, 2013

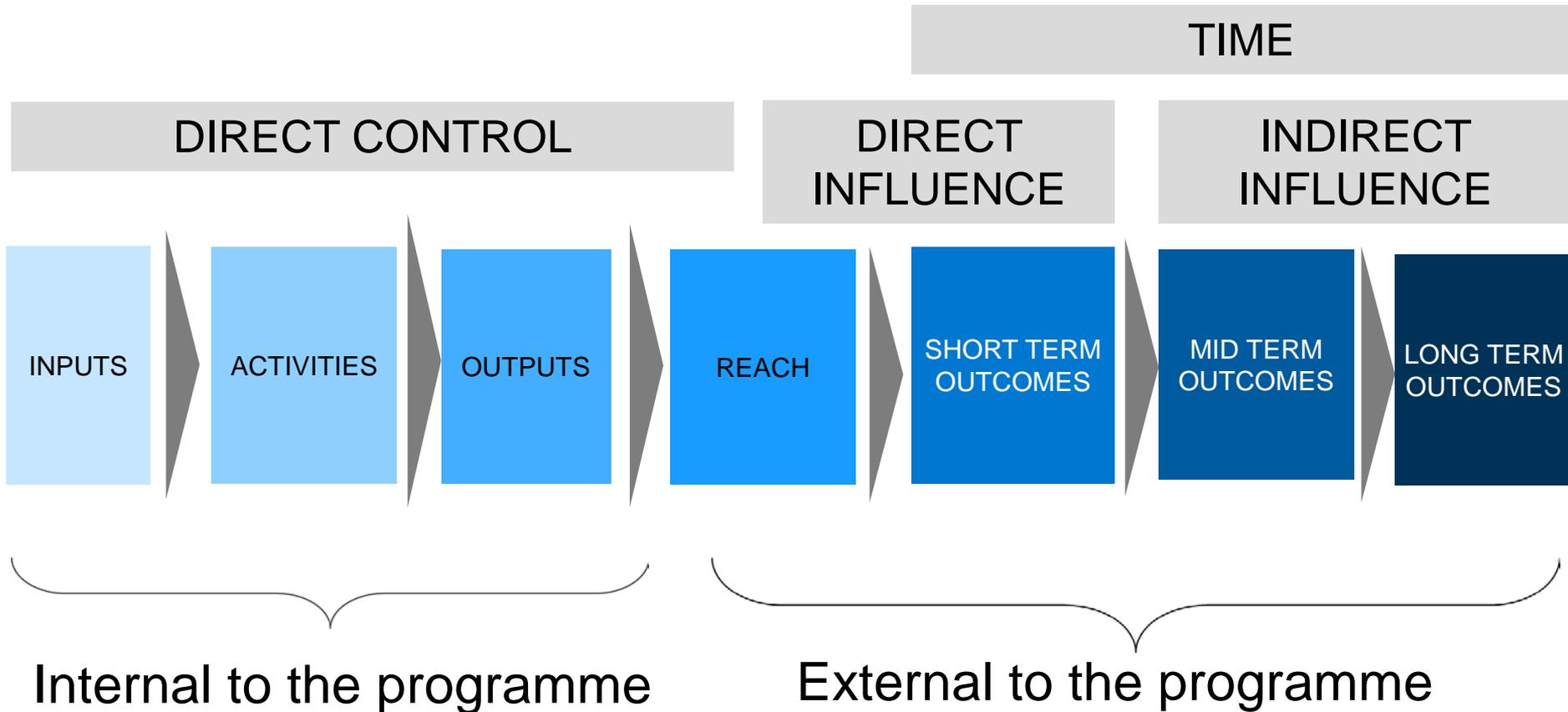


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Attribution/ contribution

Example



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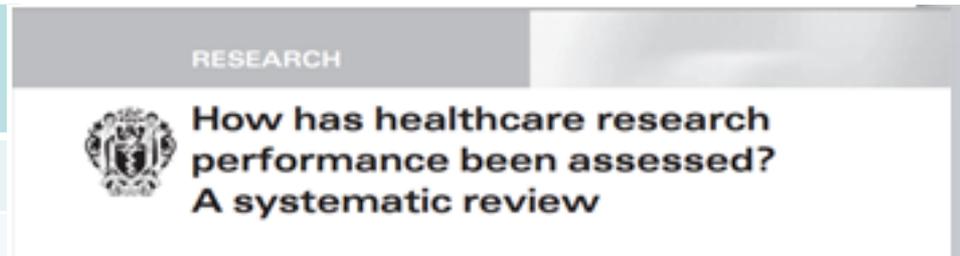
Other practical considerations

- Organizational alignment
- Mandatory requirements
- Baseline and benchmark data
- Reference to:
 - recommended indicators from research literature
 - existing indicators (e.g., indicator libraries) and indicator selection panels
 - leverage and identify common indicators with partners



Research: systematic review **Example**

Indicators	# of studies
Number of publications	38
Number of citations	27
Impact factor	15
Research funding	10
Degree of co-authorship	9
H-index	5



Source: Patel VM, Ashrafian H, Ahmed K, Arora S, Jiwan S, et al. (2011) How has healthcare research performance been assessed? A systematic review. Journal of the Royal Society of Medicine 104(6): 251–261 [[PMC free article](#)]



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Indicator libraries

Example

CAPACITY BUILDING					
	Indicator	Description	Level of Application	Category	Pillars that indicators are relevant to
PERSONNEL	Graduated research students in health-related subjects	<ul style="list-style-type: none"> * Numbers of graduated PhD/ MSc/MD, year on year * Should be able to disaggregate to subjects, gender, etc. 	<ul style="list-style-type: none"> * Not recommended at the individual level * Can be used at institutional level * Most useful provincially or nationally 	<ul style="list-style-type: none"> * As an aspiration we would also like to track the success of training programs in producing outstanding scientists and the progress that all research graduates make 	All pillars

Source: CAHS, Canadian Academy of Health Sciences. (2009) *Making an Impact: A Preferred Framework and Indicators to measure Returns on Investment in Health Research*. Ottawa, ON: CAHS.

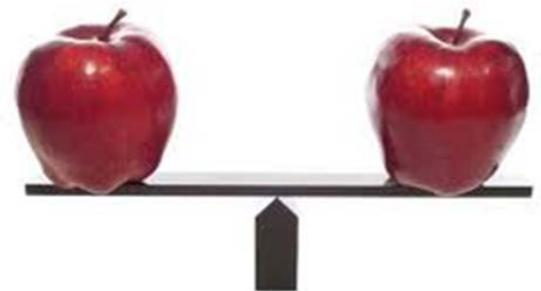
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Econometric benchmark data **Example**

NAPRHO Indicator	CAHS Indicator
E3 Patents	• Number of patents licensed
E4 Licensing	• Licensing returns (\$)
E5 Spin-offs	• Valuation of spin-out companies (\$)
E9 Employment	• Economic rent
E10 Educational impacts	• Graduated research students in health related subjects
NAPHRO Added Indicators	
E1 Provincial share of national and other funding	
E2 Federal-level funding success rates	
E6 Pharmaceutical R&D spending	
E7 Biotechnology R&D spending	
E8 R&D GDP	



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THE SCIENCE BEHIND INDICATOR SELECTION

Indicator selection criteria

- Attractiveness

- Validity
- Relevance
- Behavioural impact
- Transparency
- Coverage
- Recency
- Methodological soundness
- Replicability
- Comparability

- Feasibility

- Data availability
- Cost of data
- Compliance costs
- Timeliness
- Attribution
- Avoids gamesmanship
- Interpretation
- Well-defined

Source: CAHS, Canadian Academy of Health Sciences. (2009) *Making an Impact: A Preferred Framework and Indicators to measure Returns on Investment in Health Research*. Ottawa, ON: CAHS.

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FABRIC criteria for selecting balanced indicator sets

- **F**ocussed on the organization's objectives
- **A**ppropriate for the stakeholders who are likely to use the information
- **B**alanced to cover all significant areas of work performed by an organization
- **R**obust enough to cope with organizational changes (such as staff changes)
- **I**ntegrated into management processes
- **C**ost-effective (balancing the benefits of the information against collection costs)

Source: CAHS, Canadian Academy of Health Sciences. (2009) *Making an Impact: A Preferred Framework and Indicators to measure Returns on Investment in Health Research*. Ottawa, ON: CAHS.

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Cautions and considerations



Cautions

- Not measuring something because it isn't available or perfect
- Using isolated indicators may bias impressions
- Measuring too many things
- Use of too narrow a set
- Use only lagging indicators
- Double counting
- Focus on the indicator or measure

Considerations

- Identify aspirational indicators and partner on developing alternatives
- Use a balanced set
- Consider selecting key set
- Balance across impacts of interest
- Balance with leading indicators
- Look at contribution bundles
- Focus on the programme change



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Putting it all together...

Example

Impact	General Question	Specific Assessment Questions	Indicators /metrics
Building research capacity	Are we building research capacity in our jurisdiction?	Q1: Are we developing highly qualified research personnel in our province? Q2: Is the infrastructure being built to support personnel? Q3. Are we leveraging additional capacity for the province through attracted funding?	# of graduated students per year (MSc, PhD, MD-PhD) \$/% invested in infrastructure programmes Total 'additional funding' attracted (\$)



Learning activity

At your table use the indicators from the “Block 3, session 2, exercise 2” envelope and follow the instructions:



1. Agree on indicators that answer the three specific assessment questions
Discuss why you think they are best to answer the question
2. Next, select two key indicators that best answer each question
Discuss in your group:
 - Rationale for why two key indicators are better for answering the question
 - What you found challenging about the exercise

(15 minutes)



Getting to impact....

*“Measuring
what matters”*



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Key messages

- Engage stakeholders in defining success and understanding impacts of interest
- A programme logic model can be a useful tool to guide your measurement system
- Choose indicators that address assessment questions, are balanced and appropriate to the programme context
- Use specific criteria to select indicators
 - Indicator selection requires time and care
- Make sure the indicator is not driving success



Recommended reading

Jordan, Gretchen B. 2013. Logic Modeling: A Tool for Designing Program Evaluations, in *Handbook on the Theory and Practice of Program Evaluation*, Albert N. Link and Nicholas S. Vonortas, Editors, Edward Elgar Publishing, April.

Kaplan R, Norton D. The Balanced Scorecard: Translating Strategy into Action. Boston, MA: Harvard Business School Press; 1996.

Funnell, S. (2000). "Developing and Using a Program Theory Matrix for Program Evaluation and Performance Monitoring," in *New Directions for Evaluation*, Rogers, et.al. Eds., San Francisco: Jossey-Bass, Number 87, Fall, pp. 91-102.

Patel VM, Ashrafian H, Ahmed K, Arora S, Jiwan S, et al. (2011) How has healthcare research performance been assessed? A systematic review. *Journal of the Royal Society of Medicine* 104(6): 251–261 [[PMC free article](#)]

Treasury Board of Canada Secretariat. Standard on Evaluation for the Government of Canada <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=15688>

Thank you!

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