



Hosted by



# Measuring your impacts

Kathryn Graham

Alberta Innovates - Health Solutions

PRINCIPLE PARTNER



PLATINUM SPONSOR



GOLD SPONSORS



SILVER SPONSORS



BRONZE SPONSORS



SPECIAL EVENT SPONSORS



FOUNDING ORGANISATIONS



**The International School  
on Research Impact Assessment**

MELBOURNE | 19-23 SEPTEMBER 2016

# Learning outcomes

- Know the characteristics of good indicators
- Understand the difference between an engagement versus impact indicator
- Understand the steps in operationalising Key Performance Indicators (KPIs)
- Select KPIs of interest to your stakeholders
- Generate a balanced set of KPIs using the impact pathway (logic model)



# Why is measurement important?

“What gets measured gets improved”

Peter F. Drucker



# Indicators defined

*Measure, metric and indicator* often used interchangeably

**Indicator:** The particular characteristic or dimension used to determine change (e.g. speed)

**Measure/metric:** The unit of measurement (e.g. km/hr)



# Importance of 'good' indicators

- Tells a brief, convincing performance story about what a program has (or has not) achieved, especially when a balanced set of indicators is used
- Establishes the evidence to answer stakeholder questions about the program's impact



# Use of 'good' indicators

- Track progress and achievement of goals
- Provide measures of change (or not) to inform decisions and actions
- Feed into reporting systems

## Tip:

Early on, consider how you will display, validate, review and act on indicators



# Types of indicators

Leading	Lagging
<p>Gives an indication <b>BEFORE</b> the anticipated impact occurs</p> <p>Characteristics:</p> <ul style="list-style-type: none"><li>✓ Input-oriented</li><li>✓ Hard to measure</li><li>✓ Easy to influence</li><li>✓ e.g., patient daily referral volumes</li></ul>	<p>Provides the evidence <b>AFTER</b> the impact has occurred</p> <p>Characteristics:</p> <ul style="list-style-type: none"><li>✓ Output-oriented</li><li>✓ Easy to measure</li><li>✓ Hard to influence or improve</li><li>✓ e.g., patient average referral to admission cycle times</li></ul>



# Steps for generating & selecting indicators

1. Engage stakeholders and strategically align to the purpose and intended use of the assessment
2. Develop assessment questions across your impact pathway (logic model)
3. Generate a list of possible indicators
4. Assess and select the best key performance indicators (KPIs)
5. Review indicators for use and action





# Step 1: Engage stakeholders & strategically align

- Participative approach
  - ✓ Ask stakeholders about their impacts and indicators of interest
- Strategically align & review purpose and target
  - ✓ Vision & mission
  - ✓ Program goals & objectives
  - ✓ Organisational requirements
  - ✓ External mandatory requirements

## Goal alignment



# Step 2: Develop impact assessment questions

## Develop impact assessment questions

Ask stakeholders what they need to know



## Indicators

Gives the evidence to answer their questions



# Example of questions and indicators along the impact pathway

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS
What resources were invested in the Program?	What are you doing to accomplish your Program goals?	What are the direct products / services / solutions produced by your Program?	What was the uptake or adoption of your Program outputs?	What was the benefits / consequences of using your solutions?
<ul style="list-style-type: none"> <li>• staff FTE</li> <li>• non-staff FTE</li> <li>• appropriation funding</li> <li>• external funding</li> <li>• grants</li> <li>• in-kind contributions</li> <li>• equipment/facilities</li> </ul>	<ul style="list-style-type: none"> <li>• research/technology development</li> <li>• education</li> <li>• industry engagement (incl. SMEs)</li> <li>• international engagement</li> </ul>	<ul style="list-style-type: none"> <li>• publications</li> <li>• prototypes</li> <li>• patents applications</li> <li>• training packages</li> <li>• students who completed mentorship training</li> <li>• new services</li> <li>• new/updated standards</li> <li>• reports</li> </ul>	<p><b>Uptake (awareness)</b></p> <ul style="list-style-type: none"> <li>• Training accessed by users</li> <li>• new research protocols and techniques used</li> </ul> <p><b>Adoption (use)</b></p> <ul style="list-style-type: none"> <li>• industry, government &amp;/ or community usage</li> <li>• process changes implemented</li> <li>• behavioural change</li> <li>• sales of new products</li> <li>• licenses / IP sold</li> </ul>	<p><b>Economic impact</b></p> <ul style="list-style-type: none"> <li>• economic activity</li> <li>• quality workforce</li> <li>• productivity improvement</li> </ul> <p><b>Environmental impact</b></p> <ul style="list-style-type: none"> <li>• water savings</li> <li>• habitat rehabilitation</li> <li>• prevention of invasive species</li> <li>• reduced CO<sub>2</sub> emissions</li> </ul> <p><b>Social impact</b></p> <ul style="list-style-type: none"> <li>• health &amp; wellbeing</li> <li>• social cohesion</li> </ul>

# Example of questions and indicators along the impact pathway

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS
What resources were invested in the Program?	What are you doing to accomplish your Program goals?	What are the direct products / services / solutions produced by your Program?	What was the uptake or adoption of your Program outputs?	What was the benefits /consequences of using your solutions?
<ul style="list-style-type: none"> <li>• staff FTE</li> <li>• non-staff FTE</li> <li>• appropriation funding</li> <li>• external funding</li> <li>• grants</li> <li>• in-kind contributions</li> <li>• equipment/facilities</li> </ul>	<ul style="list-style-type: none"> <li>• research/technology development</li> <li>• education</li> <li>• industry engagement (incl. SMEs)</li> <li>• international engagement</li> </ul>	<ul style="list-style-type: none"> <li>• publications</li> <li>• prototypes</li> <li>• patents applications</li> <li>• training packages</li> <li>• students who completed mentorship training</li> <li>• new services</li> <li>• new/updated standards</li> <li>• reports</li> </ul>	<p><b>Uptake (awareness)</b></p> <ul style="list-style-type: none"> <li>• Training accessed by users</li> <li>• new research protocols and techniques used</li> </ul> <p><b>Adoption (use)</b></p> <ul style="list-style-type: none"> <li>• industry, government &amp;/or community usage</li> <li>• process changes implemented</li> <li>• behavioural change</li> <li>• sales of new products</li> <li>• licenses / IP sold</li> </ul>	<p><b>Economic impact</b></p> <ul style="list-style-type: none"> <li>• economic activity</li> <li>• quality workforce</li> <li>• productivity improvement</li> </ul> <p><b>Environmental impact</b></p> <ul style="list-style-type: none"> <li>• water savings</li> <li>• habitat rehabilitation</li> <li>• prevention of invasive species</li> <li>• reduced CO<sub>2</sub> emissions</li> </ul> <p><b>Social impact</b></p> <ul style="list-style-type: none"> <li>• health &amp; wellbeing</li> <li>• social cohesion</li> </ul>

# Step 3: Generate a list of possible indicators

- **Mix of qualitative and quantitative indicators**
- **Triangulate across multiple data sources**

**Sources for indicators:** Research literature, benchmark, indicator libraries, data capturing tools, sharing through networks, available organizational indicators

## Tip:

Triangulation makes sure that indicators are credible, useful and meaningful

### Research literature best practices

#### *Inputs*

- Stock of R&I personnel
- Business expenditure on R&D (BERD)
- Gross Expenditure on R&D (GERD)
- Higher education expenditure on R&D (HERD)
- Indirect financial support
- Private financial support
- Level of collaboration
- Mentoring

#### *Activities*

- Intensity of R&D
- Knowledge exchange

#### *Outputs and Outcomes*

- Trained people
- Publications and citations
- New or improved products/services
- One year survival rate
- Patent productivity & quality
- Rate of new venture creation
- Total sales (domestic & international)
- Growth sales per year
- Annual gross revenue



# Step 3: Generate a list of possible indicators

## Benchmarking

- Easier to benchmark if use standardized indicators with definitions
  - Enables performance across different research and innovation organisations to be compared
  - Assist in driving continuous improvement

### NAPHRO indicators

Provincial share of national & other funding

R&D GDP

Pharmaceutical R&D spending

Biotechnology R&D spend

Federal-level funding success rates

Patents

Licensing

Spin-offs

Employment

Educational impacts



# Step 3: Example of CSIROs Impact Indicators

Environmental Impact Categories	Social Impact Categories	Economic Impact Categories
1. Air quality	1. Health and wellbeing	1. National economic performance
2. Ecosystem health and integrity	2. Access to resources and opportunities	2. Trade and competitiveness
3. Climate	3. Quality of life (material security and livelihoods)	3. Productivity and efficiency
4. Natural hazards mitigation	4. Safety	4. Management of risk and uncertainty
5. Energy generation and consumption	5. Security (e.g. cyber, biological, civil and military)	5. Policies and programs
6. Land quality	6. Resilience	6. New services, products, experiences and market
7. Aquatic environments	7. Indigenous culture and heritage	7. Securing and protecting existing markets
8. Built environments	8. Innovation and human capital (creativity and invention)	
	9. Social cohesion	



ECONOMIC IMPACT	DEFINITION	INDICATORS
National economic performance	The capability to influence or change at the macroeconomic level, i.e. economy-wide impacts, such as changes in unemployment, national income, rate of growth, gross domestic product, inflation and price levels.	<ul style="list-style-type: none"> <li>• National income</li> <li>• Rate of growth</li> <li>• Inflation and price levels</li> </ul>
Trade and competitiveness	The capability of trade-exposed firms to succeed in international competition against leading international competitors.	<ul style="list-style-type: none"> <li>• Changes in-balance of trade (exports -imports)</li> <li>• Terms of Trade</li> </ul>
Productivity and efficiency	The capability to influence or change the production of products and services such as risk, profitability and productivity aspects, and sustainability of the production and consumption system. This also includes the capability to influence or change the performance measures related to the supply chain members.	<ul style="list-style-type: none"> <li>• Input costs</li> <li>• Input use efficiency, quality and consistency of product</li> <li>• Market access</li> <li>• Supply chain costs and supply chain management</li> </ul>
Management of risk and uncertainty	The capacity for rapid innovation at scale to reduce risk of damage or lost opportunity (in the form of early warnings or early identification of opportunities).	<ul style="list-style-type: none"> <li>• Derived indicator of dynamics and or risk such as reduction in risk marginal charge</li> <li>• reduction in insurance costs</li> <li>• reduction in assistance payments made after floods, etc.</li> <li>• reduction in infrastructure repair from extreme events.</li> </ul>
Policies and programs	The capability to influence or change the coordination and governance of social, economic and environmental policies and programs, for example, better return on investment and reduction in green and red tape.	<ul style="list-style-type: none"> <li>• Changes in regulatory burdens (red and green tape)</li> <li>• Insurance value in protecting against overlooking key information or insights</li> </ul>
Securing and protecting existing markets	The capacity to maintain and/or increase returns from existing market access.	<ul style="list-style-type: none"> <li>• Changes in market share and revenues</li> </ul>



ENVIRONMENTAL IMPACT	DEFINITION	INDICATORS
Air quality	The degree to which the air in a particular place has changed.	<ul style="list-style-type: none"> <li>• Changes in physical air quality (such as national air quality standards PM10)</li> <li>• Number of days when specific pollutants and particulates are below world health specified thresholds -pre and post CSIRO intervention.</li> </ul>
Ecosystem health and integrity (natural capital)	The variety and connections between plant and animal life in the world or in a particular habitat. Focus on plants and animals within an area and how they interact with each other as well as with other elements such as climate, water and soil. Also the ecosystem services provided to protect ecosystems and biodiversity. Look to add the concepts around natural capital	<ul style="list-style-type: none"> <li>• Diversity of biota and ecosystems</li> <li>• Bioregional Assessments</li> <li>• Extinction rates</li> <li>• Tree clearing rates</li> <li>• Freshwater salinization rates</li> <li>• Wetland decline etc.</li> </ul>
Climate	Focus on atmospheric, land and ocean patterns and the changes in these over time.	<ul style="list-style-type: none"> <li>• Changes in global warming indicators such as GHG emissions per capita.</li> </ul>
Natural hazards mitigation	Steps taken to contain or reduce the effects of an anticipated or already occurred disastrous events (such as drought, flood, fire, lightning, various levels and types of storms, tornado, storm surge, tsunami, volcanic eruption, earthquake, landslides)	<ul style="list-style-type: none"> <li>• Derived indicator of dynamics &amp;/or risks such as reduction in relative risk of disastrous events and harm from extreme events</li> </ul>
Energy generation and consumption	The creation of energy using various technologies and processes and its effect on the environment. The effect of the use of created energy and the benefits of efficiency measures.	<ul style="list-style-type: none"> <li>• Changes in energy uses (fossil fuels, electricity and renewables)</li> </ul>

# ACTIVITY

# TIME 1



The International School  
on Research Impact Assessment  
MELBOURNE | 19-23 SEPTEMBER 2016

## Family Road Trip Impact Pathway

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS
<b>Family members</b> •2 adults •2 kids  <b>Car</b> •1 Toyota HiLux  <b>Luggage &amp; camping equipment</b> •3 suitcases •1 tent •4 sleeping bags •Cooking gear, food  <b>Documents</b> •Personal identification •Itinerary •Map  <b>Time</b> •2 weeks vacation  <b>Money</b> •\$ •Budget	Plan trip	Follow itinerary	Gain appreciation for Australia's history	Make family memories for years to come
	Drive	Stay on budget		
	Camp	Find best ice cream		
	Visit attractions	Enjoy trip as family	Gain appreciation for Australia's nature	Strengthen family bonds
	Eat ice cream	Arrive at reunion on time		
			Reconnect with extended family	

# Step 4: Assess & select the best KPIs

Considerations for selecting KPIs from generated indicators:

- Think of the 'big picture' from the perspective of stakeholders who are going to use the indicators to help select your KPIs
- Importance and feasibility
- Some indicators are more valuable than others
  - ✓ Tells a story that typically needs several indicators
  - ✓ Answers the 'so what' question
  - ✓ Informs action – the 'now what'
- Strive for balanced set of KPIs

***If stakeholders can't think of how an indicator would inform action, it should not be a KPI***



# Criteria for selecting a balanced set of indicators

## Specific

What exactly do you want to measure?

## Measurable

Identify what you need & ensure it provides the concrete evidence you need

## Achievable

Will you be able to collect the data required?

## Relevant

Are the indicators you selected actually what is needed to be measured?

## Timely

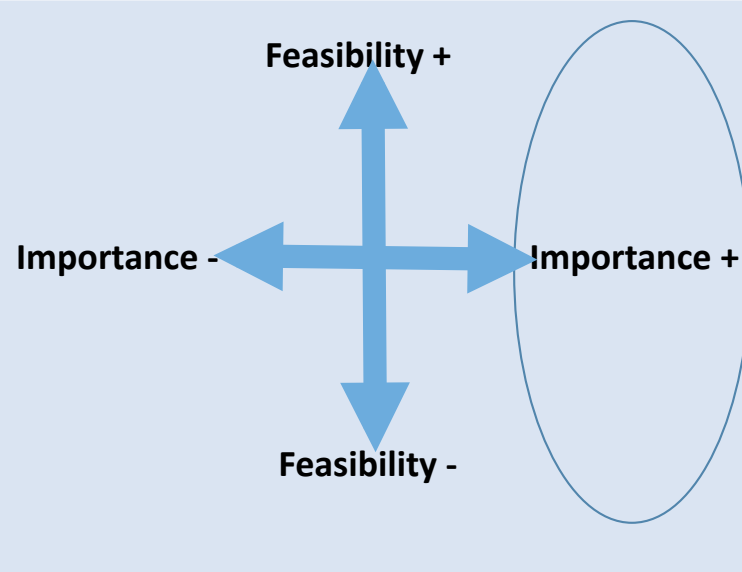
Are the indicators embedded in wider data collection timing?

## Agreed

Have you socialised the indicators, within and outside your project/program?



# Tools for selecting key performance indicators

1. Delphi Technique	2. Indicator Quadrant Technique
<ul style="list-style-type: none"><li>• Structured way to collect qualitative information from experts in relevant fields</li><li>• Use ranking, scoring &amp; feedback to arrive at consensus</li><li>• Used to develop &amp; select performance indicators</li><li>• Delphi characteristics:<ul style="list-style-type: none"><li>✓ Structured information flow</li><li>✓ Regular feedback</li><li>✓ Participant anonymity</li></ul></li></ul>	 <p>The diagram illustrates the Indicator Quadrant Technique. It features a central cross with four blue arrows pointing outwards. The top arrow is labeled 'Feasibility +', the bottom arrow is labeled 'Feasibility -', the left arrow is labeled 'Importance -', and the right arrow is labeled 'Importance +'. To the right of the cross, there is a large, light blue oval shape.</p>



# Step 5: Review indicators for use and action

Cautions	How to mitigate
Only selecting available indicators	Identify aspirational indicators & data sources
Measuring too many things	Select a key set of indicators
Using too narrow of a set	Balanced set of indicators
Using only lagging indicators	Balance with leading indicators
Double counting	Look at contribution bundles
Focusing on the indicator	Focus on the program change



# ACTIVITY

# TIME 2



The International School  
on Research Impact Assessment  
MELBOURNE | 19-23 SEPTEMBER 2016



# Key Messages

- Engage stakeholders in defining and selecting strategic indicators
- Impact pathways (logic models) can be used to inform indicator identification and selection
- Use specific criteria to select a balanced set of feasible & important indicators, especially KPIs
- Triangulate data sources for generating indicators
- Evidence from indicators should inform action
- Metrics alone are not sufficient for assessing impact



# Thank you

Hosted by



PRINCIPLE PARTNER



PLATINUM SPONSOR



GOLD SPONSORS



SILVER SPONSORS



BRONZE SPONSORS



SPECIAL EVENT SPONSORS



FOUNDING ORGANISATIONS

