

Module 3: Indicators and Measures



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Learning Objectives

At the end of this workshop, participants will:

- Understand the basic concepts of indicators and measures
- Understand the importance of defining key terms
- Be familiar with concept of operational definitions
- Understand key measurement issues:
 - Relevance
 - Validity
 - Reliability



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Definitions: Briefly...

- A **construct** is a general concept or idea used to define a result
 - education capacity of a system; health; poverty reduction
- An **indicator** represents a key aspect of the construct
 - it is “indicative” of the construct although it does not represent it fully
- A **measure** expresses the value of the indicator in a specific quantitative or qualitative manner

Terminology note: People frequently use the word *indicator* to mean much the same as *measure*. Measures are often referred to as part of the indicator.

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Definitions: Constructs

A **construct** is a general idea used to define a result (outcome or impact) that the program seeks to achieve. This is frequently derived from a logic model. Constructs are often multi-dimensional and complex.

Frequently, a set of **construct dimensions** are identified to convert the construct into measurable indicators.

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Definitions: Indicators

An **indicator** is an aspect of the construct that can be measured or that provides evidence of the construct. Indicators are used to operationalize the construct.

Indicators can be quantitative or qualitative. An indicator can change over the life of a project, and the expected direction of change is often defined in the logic model.

- *Examples of indicators of education capacity changes:*
 - *Net enrollment*
 - *Completion rate*
 - *Students' learning achievement*

A set of indicators may be combined to create an index.

Often a set of indicators is required to adequately describe a construct.

Indicators help the managers and other decision-makers to communicate, negotiate, and decide.

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Definitions: Measures

•A measure is a method or an instrument that is used to express the quantitative or qualitative value of the indicator.

•It can be used to measure changes in the indicator.

•We can often have more than one measure for each indicator.

- *Examples for education*
 - *Primary school enrollment (% of age group)*
 - *84 percent in 1991*
 - *95 percent in 2004/05*
 - *Change between 1991 and 2004/05 - 11 percentage points*

- *Examples for poverty*

	1992/93	2004/05
<i>GNI per capita (Atlas method, US\$)</i>	\$1,245	\$1,853
<i>Poverty incidence (% below national poverty line)</i>	46	22

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Proxy Indicator

Proxy indicator. When data is not available, or is costly to collect, for certain indicators it is often necessary to use a proxy indicator.

Examples:

- Completion rate as a proxy for education quality (instead of learning achievement).
- Estimated value of house or land owned

Note: A frequent threat to the validity of evaluation findings is the use of proxies that do not adequately describe important dimensions of the construct

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Construct - Indicators - Measures

General

• **Construct** - Health



• **Indicator** - Body Temperature

Specific

• **Measure** - Degree in Celsius (C) or Fahrenheit (F)



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Operational Definition

Operationalizing your terms:

- process of moving from a broad construct (or concept or idea) to a specific measure

The key is to make construct concrete



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Example: Operationalizing Terms

Was the Case Project successful?

What do we mean by successful?

Did it achieve its goals?

But, what are its goals?

- Specific improvements?
- Specific changes/increases?

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Example: Operationalizing Terms

Discussion

- We may need to be more specific.
- For instance, we may want to
 - Use _____ ? _____ as a measure of success.
 - How do you then actually measure success?

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Define "Small"

Hagar the Horrible by Chris Browne



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Characteristics of Indicators

- An indicator must **produce simple information** which is communicable and **easily understood** by both the provider and the user of the information.
- The information provided by an indicator will be **converted into a measure of facts or opinions**. For example
 - Road quality could be measured as number of potholes per unit of road.
 - Trainee satisfaction could be measured as % of trainees who claim to be satisfied or highly satisfied.
- Indicators and their measurement units must be **sensitive to change**,
 - The quantity measured must vary significantly when a change occurs in the variable to be measured
 - For example, electricity bill collections increased from 45% to 70% (not to 47%)
- An indicator could be an absolute number **or derived from other indicators** in the form of ratios or indices (i.e. collection rates)

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Characteristics of Indicators - Cont'd

- Indicators should reflect as **precisely** as possible whatever it is meant to measure (**construct validity**)
- Measurement of an indicator should be **based on reliable data**
- Monitoring Indicators are managerial tools to **help the managers** to communicate, negotiate and decide
- In Projects, Indicators should be linked to the project objectives

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Characteristics of Measures

- May be counted (quantitative) or characterized (qualitative)
- Quantitative Indicators frequently start with “number of...” or “percent of...” The desired trend (increase or decrease) may be expressed in the indicator
- Qualitative Indicators might be expressed as “something particularly important has been accomplished,” (e.g., a law was passed)
- **More than one measure may be needed** for each indicator
- Use “**proxy / alternative**” measures if the indicator cannot be measured directly (i.e. customer satisfaction with health services as proxy for improvement in quality)
- Identify when **data will become available** for each measure.

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Selecting Measures of an Education Project

Construct	Dimension	Indicators	Measures
Quality of primary education	Capacity of teachers	A. Improvements in teachers' training skills	1. Number of teachers with training/certification 2. Children's satisfaction ratings
	Access to education	B. Improvements in access to school and classes	1. Enrollment rate 2. Completion rate 3. Attendance rate 4. Teacher/pupil ratio
	Children's learning	C. Improvements in children's knowledge	1. Literacy rate 2. Scholastic achievement (Points? Perception?)

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Criteria for Selecting Measures

1. Collectible
- 2. Relevant**
- 3. Valid**
- 4. Reliable**
5. Cost and Burden
6. Privacy / Confidentiality
7. Timely
8. Comprehensive

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Relevance: Measuring what counts

Relevance:

- Are we measuring what counts? Try to use only indicators that are important and likely to be used for management or immediate analytical purposes. In projects, make sure that the measure is useful for outcomes (PDO Indicator) or for progress towards outcomes (Intermediate Indicator). When a proxy is used, be sure it is linked with the indicator you really want to measure

- **Trap:** *Measuring what is easy to measure. (Existing data!)*

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Validity

Validity:

The measure is a good match for what we intend to represent

- Are you measuring what you think you are measuring?

-
- Example: How would you find out if graduates of the teachers college perform better than those who did not graduate?
 - One possible measure of performance can be obtained by asking graduates to rate their performance.
 - What are the advantages and disadvantages?

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Examples: Are these Valid Measures?

Measures of Community Health Status?

- Infant mortality rates
- Number of physicians
- Number of physicians per 1,000 people
- Number of deaths
- Percentage of pre-school children immunized
- Number of clinics per square mile

Measures of Educational Quality?

- Number of students
- Number of teachers
- Educational background of teachers
- Number of books and other learning resources
- Number of graduates
- Knowledge and skills learned by students
- Satisfaction of parents

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Reliability

Reliability:

- stability of measures
- they consistently measure the same thing in repeated tests.

Example: Measuring Costs Over Time

- May not be comparable
- Money may be worth less over time
- Need to standardize money

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Other Considerations: Obtrusive vs. Unobtrusive Measures

Obtrusive Measures

- With participant knowledge
 - ✓ Perceptions, opinions and attitudes gathered through interviews, surveys, focus groups
 - ✓ Scores on tests related to the program

Unobtrusive Measures

- Without participant knowledge
 - ✓ Historical/document/archival data
 - ✓ Data already collected for another purpose: secondary sources

Will those being studied know they are being studied?

- If they know, it introduces a risk of error
 - they might change their behavior
 - they might change what they say

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Other Considerations: Where do the Data Reside?

- Where are the best sources of data?
- Do the data already exist?
- Do you have to collect new data?
- Data source issues
 - Which ones might be easier to obtain?
 - Which ones might be very difficult to obtain?
 - How accurate and reliable are each of the data sources?

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Where Can We Find These Measures?

- Number of students
- Number of teachers
- Educational background of teachers
- Number of books and other learning resources
- Number of graduates
- Knowledge and skills learned by students
- Satisfaction of parents

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Indicators and Measures: Summary

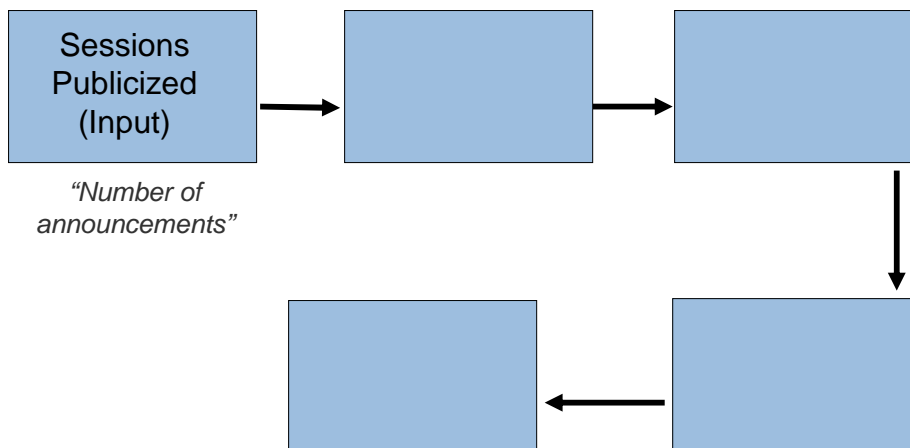
1. Indicators should be informed by an overall measurement strategy, linked to key analytical questions.
2. Indicators represent the inputs, activities, outputs, and outcomes for development projects, programs, or policies. Indicators enable managers to track progress, demonstrate results, and take corrective action to improve service delivery.
3. Performance outcome indicators focus on project accomplishments and results. They may lead to final effects of the project, but are not themselves the final effect.
4. Be clear and specific about the desired outcomes of the program or project and about defining terms.
5. Quality of measures depends on: relevance, validity, reliability
6. Quality of measures may also depend upon your data collection methods.

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Discussion: Linking Results Chain to indicators and measures (Stop Smoking Program)

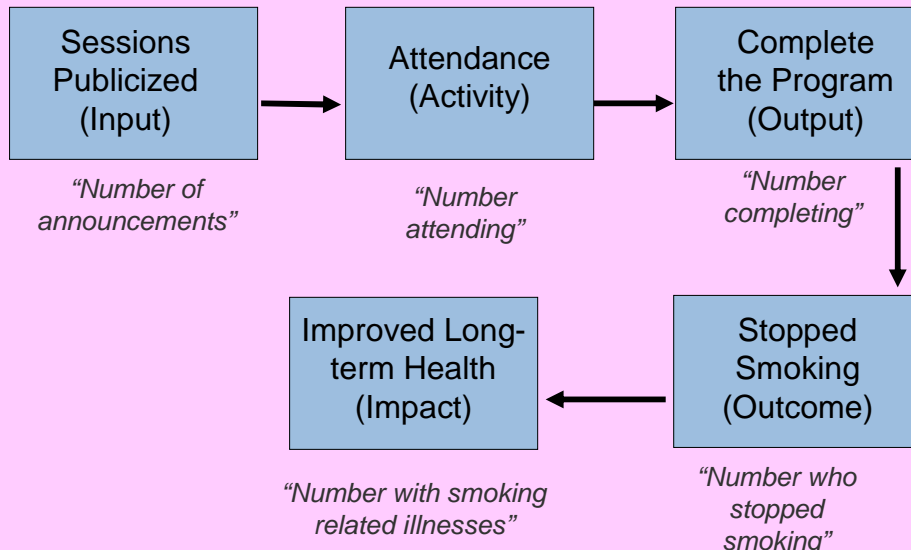


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Discussion: Linking Results Chain to indicators and measures (Stop Smoking Program)



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Evaluation Plan

Case Example

What **indicators** and **measures** are needed for each sub-question?

- Enter both indicators and measures in the evaluation plan.

What **indicators** and **measures** would be best for each outcome objective?

- Enter both the indicators and measures in the arrangements for results monitoring.

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Evaluation Plan

General Questions	Specific Sub-Questions	Type of Question	Type of Design	Indicators & Measures	Data Sources	Data Collection & Sampling	Data Analysis

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From Results Chain to Results Framework

- The Results Framework explains how the Project Development Objectives are to be achieved
- It is the result of translating the Results Chain into credible indicators

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Discussion - Results Framework Example: Albania Transport Project (simplified)

*See slide 10 of Module 2

Project Development Objective (PDO)	Project Outcome Indicators	Use of Project Outcome Information
Reduce user costs in the Milot-Rreshen section	Vehicle journey time between Milot and Rreshen reduced by 25 percent.	General Road Directorate (GRD) to monitor the outputs and attainment of the project development objective.
Intermediate Outcomes	Intermediate Outcome Indicators	Use of Intermediate Outcome Monitoring
Component 1: Construct 26 kilometers of highway between Milot and Rreshen.	Component 1: Number of km of road constructed between Milot and Rreshen.	Component 1: GRD, Project Implementation Team (PIT), and the Ministry of Public Works, Transport and Telecommunications (MPWTT) to monitor implementation progress.
Component 2: Introduction of innovation in road maintenance in two Pilot Regions.	Component 2: Evidence of satisfactory maintenance regime in the two pilot regions by cumulative improvement in road roughness.	Component 2: Information will be used by GRD PIT and the MPWTT to monitor implementation progress.

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Exercise: Results Framework

- Based on the Results Chain you have created fill the Results Framework.

Project Development Objective (PDO)	Project Outcome Indicator	Use of Project Outcome Information
Intermediate Outcomes	Intermediate Outcome Indicators	Use of Intermediate Outcome Monitoring

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Exercise: Arrangements for results monitoring

Based on the Results Chain you have created fill out indicators column of the arrangements for results monitoring.

Project Outcome Indicators	Baseline Value	Target Values			Data Collection and Reporting		
		Year 1	Year 2	Year 3	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Intermediate Outcome Indicators							
Component 1:							
Component 2:							

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Exercise 3-A

Determining Indicators and Measures

- Refer to the handout. Match measures with indicators on the Results Chain which your group constructed in Module 2.

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Group Project Exercise

Your project – for evaluation

- Place your questions, sub-questions, types of questions in the appropriate columns
- Which designs would be most appropriate in answering your questions?
- Insert “indicators” and “measures” into the appropriate columns
- Fill appropriate columns of the Results Framework

Your project – for monitoring

- Insert “indicators” into the appropriate columns of Arrangements for results monitoring

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