

Module 5

Data Collection Methods

Developing a Data Collection Plan

Why Data Collection Is Important For You!

- A performance outcome measure is not a real measure until a practical data collection procedure has been identified!
- The specific measure determines the data collection procedure; the data collection procedure determines the specific measure.
- Reflected in a detailed data collection plan

Steps in Developing a Data Collection Plan

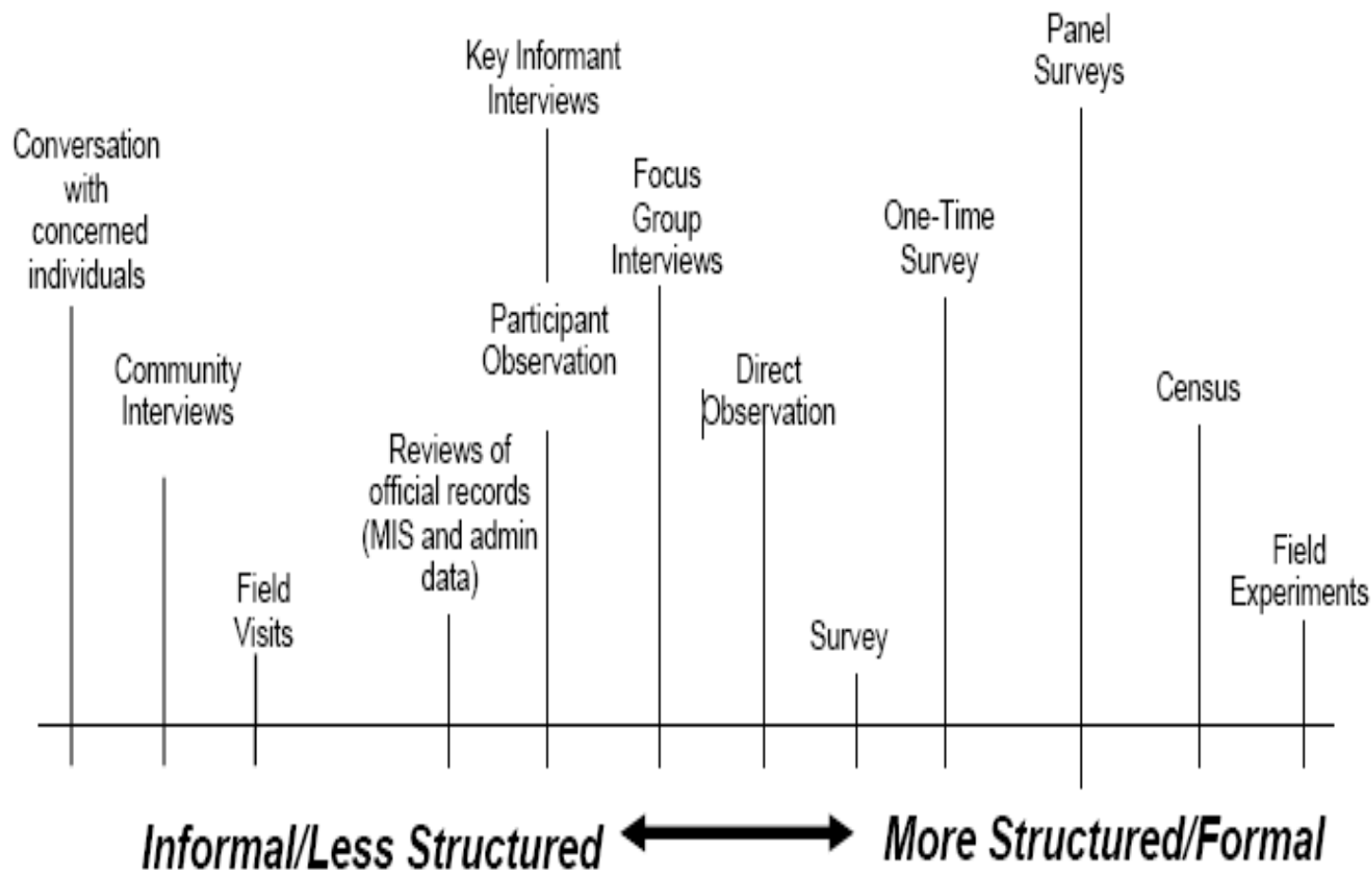
- Identify *where* the data reside
- Identify *what* specific data are needed
- Identify *how* the data will be collected
- Identify *who* will be responsible for collecting and reporting the data
- Identify *when* the data will be collected and reported, including how frequently
- Identify *time* and *costs* and *who pays*

Key Types of Data Collection Methods for Evaluation and Monitoring

- Existing data / Archival data (records, program information, etc.)
- Observations (with or w/out participant knowledge)
- Surveys
 - Self-administered questionnaires
 - In-person interviews
 - Telephone surveys
 - Web-based surveys
- Focus groups
 - Systematically collected expert judgments
- Role playing
- Tests, especially of learning

- You have some choice in how structured you wish to be in collecting data. If you want great precision, then structure is better. If you want depth and nuance, or if you are uncertain about what you want to specifically measure, then a semi-structured or even an informal approach is better.

Summary of Data Collection Methods



Data Collection General Rules

The following are general rules to help you with data collection.

- Use available data if you can. (Using it is faster, less expensive, and easier than generating new data.)
- If using available data, be sure to find out how earlier evaluators:
 - collected the data
 - defined the variables
 - ensured accuracy of the data.
- If you must collect original data:
 - establish procedures and follow them (protocol)
 - maintain accurate records of definitions and coding
 - pre-test, pre-test, pre-test
 - verify accuracy of coding, data input.

Surveys

- Sometimes surveys will be the only feasible way to obtain useful outcome data.
- Valuable tool for citizen input. Shows government's interest in citizens' views.
- Can be surprisingly inexpensive.

Two Types of Commonly Used Surveys

- Surveys of all households (Household Surveys)
- Surveys of beneficiaries (beneficiaries Survey).

Surveys of All Households

- Can ask respondents about more than one service—thus, reducing the survey cost to any one agency or program.
- Can obtain information on the percent of different persons using a service.
- Can obtain information on citizens that are not users of a service, such as why they have not used the service.
- Negative: May need a large and complex sample

Surveys of Beneficiaries

- Can provide more detailed information for service managers.
- Is considerably easier to contact those to be surveyed.
- Users are more likely to be willing to answer.
- Likely to be considerably less expensive than surveying the whole population.
- Negative: Provides a narrow information base.

Information Obtainable with Surveys of Beneficiaries

- Beneficiaries' *condition* (e.g., income, health, employment, housing) – during, at the end of service, and/or after a period of time after services received
- Beneficiaries' *ratings of a service* provided by their government (social, finance, support services)
- Ratings of citizen *confidence* and *trust* in their government
- Extent to which citizens are *informed about public services* and their government

Survey Methods

- In-person interviews
- Telephone interviews
- Mail
- Self administered at a facility
- Computer (WEB)-based

What Makes a Good Survey?

- Quality of the questionnaire
- Adequate pre-testing
- Quality of interviewers
- Quality of the sample
- Extent of respondent recall
- Sensitivity of the questions
- Confidentiality
- Valid response rates
- Accuracy of data entry

Comparison of Three Methods of Gathering Information

	Face to face	Telephone	By Mail
Complexity of information	High	Medium Low	Low
Time required to survey	Medium	Short	Long
Cost	High	Medium	Low
Processing delay	Short	Short	Long
Resources required	Many	Medium	Few
Influence of surveyor	High	Medium	Low
Degree of anonymity	Low	Medium	High
Rate of response	High	Medium	Low

Recommendation: Triangulation

- Typically, a variety of data collection approaches are used in combination to answer different evaluation questions or to provide multiple sources of data in response to a single evaluation. You may collect available data from farmers' crop yield records, interview buyers of farm produce, and survey the farmers themselves. Sometimes researchers use focus groups to help develop a questionnaire or to make sense of survey results. Collecting the same information using different approaches in order to get more accurate information to an evaluation question is called methodological **triangulation**.

Baselines and Targets

- If you do not know where you are, how can you know where you are going?

Baseline Measures and Targets

Baselines

- Initial information on program participants or other program aspects collected prior to receipt of services or program intervention.
- Baseline data will be used later to provide a comparison for assessing program outcomes or impacts.
- Obtain baseline data whenever possible

Baseline Measures and Targets

Targets Set to Compare with Baselines:

- Start with the baseline data. Set targets for each *measure*.
- Set targets for each *reporting period*, such as monthly or quarterly reports – to consider seasonal variations.
- Set targets *jointly* (program and agency management, central budget office, legislature).
- Reassess the targets periodically

Availability of Baseline Data

- Baseline data are vital for setting future targets.
- Identify the extent of current availability of data for each performance outcome measure.
- Where data are not available, identify the needed data collection procedures.
- Meaningful target-setting may not be possible until initial data have been obtained.
- May show that time trend data are also available (that is, data for previous years).

Baseline

- A **performance baseline** is information (qualitative or quantitative) about performance on the chosen indicators at the beginning of (or immediately prior to) the intervention. In fact, one consideration when choosing indicators is the availability of baseline data, which will allow performance to be tracked relative to that baseline. Sources of baseline data can be either **primary** (gathered specifically for this project) or **secondary** (collected for another purpose, but can be used). Secondary data can come from within your organization, from the government, or from international data sources. Secondary data can save you money when acquiring data, but be careful to check that it really is the information you need – you will find it extremely difficult to go back and get primary baseline data if you later find out that the secondary source does not meet your needs!

How Should Targets be Set?

- Examine actual achievements in past periods
- Consider expected budgeted resources (e.g., funds and staff)
- Consider external factors
- Consider using ranges or contingency targets
- Provide higher level review
- Balance political needs and the need for realistic targets
- Reassess targets periodically
- *Others ???*

Common Monitoring and Evaluation Framework (CMEF) - Baseline

- The baseline analysis should at least cover:
 - The *economic* situation/competitiveness of the agrifood sector (farm and processing sector), showing strengths/weaknesses and needs in terms of investment in human and physical capital and where relevant of the forestry sector;
 - The general *environmental* situation in relation to biodiversity, water (role of agriculture and forestry in water management in quantity and quality in relation to the Water Framework Directive) and climate change (role of agriculture and forestry) and identification of needs in the three areas;
 - The general *socio-economic* situation in rural areas, identifying strengths/weaknesses and needs (in terms of diversification, quality of life and of capacity building)

Data collection Issues

- The types of information that surveys can and cannot validly collect in development contexts,
- The kinds of resources needed to do surveys well, and
- Ethical considerations

Be Cautious of Overly Aggregated Data!!

Data for each outcome measure should be broken out (disaggregated) to show outcomes for different sub-groups

Possible Data Sub-sets: Demographic Characteristics

- By household income (or proxy for this)
- By gender
- By age group
- By race/ethnicity
- By geographical area, such as rural versus urban locations, by district, by municipality

Discussion

- How do you collect your data? What methods do you use?
- Do you disaggregate?
- What are the challenges you face?

Exercise 5.1

- Which of the following is the definition of **validity**?
 - a. a term used to describe how trustworthy or believable the data collection is
 - b. a term used to describe if a measurement actually measures what it is supposed to measure
 - c. a term used to describe the stability of the measurement
 - d. a term used to describe how the language used in the data collection matches the measure

Exercise 5.2

- Which of the following is the definition of reliability?
 - a. a term used to describe how trustworthy or believable the data collection is
 - b. a term used to describe if a measurement actually measures what it is supposed to measure
 - c. a term used to describe the stability of the measurement
 - d. a term used to describe how the language used in the data collection matches the measure

Exercise 5.3

- If you want to collect information about peoples' perceptions, opinions, and ideas which of the following data collection techniques would be a good choice?
 - a. open-ended survey
 - b. observation
 - c. available data
 - d. self-report checklist

Exercise 5.4

- If you want to collect information about peoples' actual behavior which of the following data collection techniques would be a good choice?
 - a. open ended survey
 - b. observation
 - c. focus group
 - d. self-report checklist

Exercise 5.5

- If you want to collect information by engaging people in dialogue to reveal a range of views and perspectives which of the following data collection techniques would be a good choice?
 - a. survey
 - b. observation
 - c. focus group
 - d. self-report checklist

Module 6

Sampling

How do we Collect Data?

- Can we collect data from the entire population?
 - All files, all streets, all people?
- When we can, we can talk about what is true for the entire population.
- But often we cannot:
 - time and cost constraints

Sampling

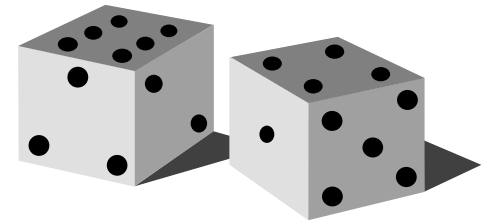
- Is a data collection strategy
- Is widely used in all sectors
- Offers distinctive efficiencies for gathering data about populations

Why Sample?

- A **sample** allows us to make statements about the larger population based on what we learn from a subset.
- Two general types of sampling:
 - Random sampling
 - Non-random sampling

Random Sampling

- In statistical terms a random sample is a set of items that are drawn from a population in such a way that each time an item is selected, every item in the population has an equal opportunity to appear in the sample.
- **Advantages**
 - Eliminates selection bias
 - Able to generalize to the population
 - Cost-effective
- **Challenge**
 - To locate a complete listing of the entire population from which to select a sample.



Random Sampling

- **Sampling Concepts**
 - **Population**
 - the total set of units
 - **Sample**
 - a subset of the population
 - **Sampling Frame**
 - list from which to select your sample

Random Sampling

- **Sampling Concepts (continued)**
 - **Sample Design**
 - methods of sampling
 - **Parameter**
 - characteristic of the population
 - **Statistic**
 - characteristic of a sample

Random Sampling Process

- Obtain a complete listing of the entire population
 - Assign each case a number
- Randomly select the sample
 - Random numbers
 - Every X number of cases for systematic random sampling

Types of Random Samples

- **Simple Random Sample**
 - Simplest
 - Subset of the entire population
- **Stratified Random Sample**
 - Population is separated into strata (or groups).
 - Each stratum is randomly sampled
- **Cluster Sample**
 - Useful when you don't have a complete listing of the entire population.
 - If you want to survey all pregnant women, you probably don't have a list.

Types of Random Samples

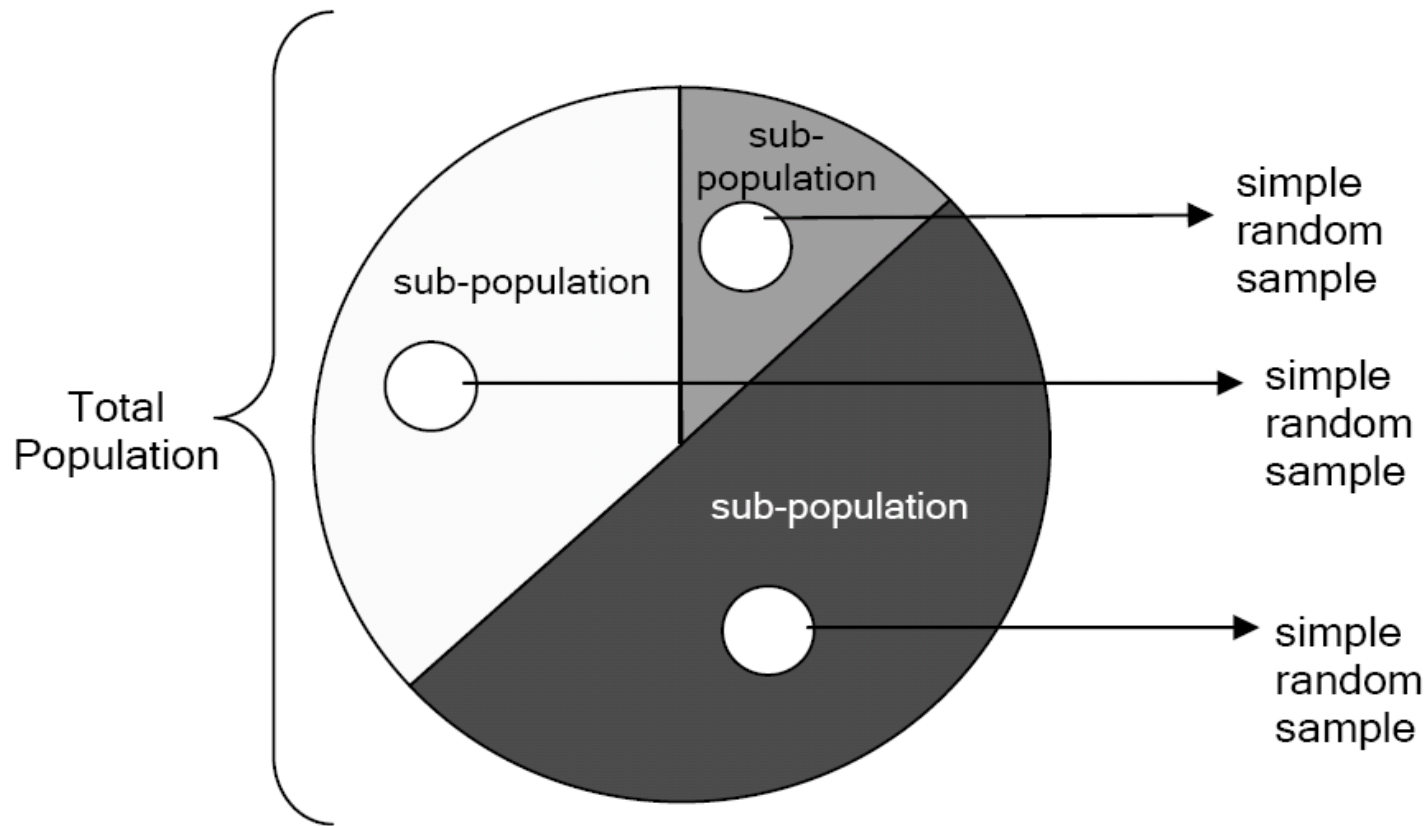
- **Simple Random Sample**
 - simplest
 - subset of the entire population
- **Example: A sample drawn from a list of all graduates of the teachers college**

Types of Random Samples

- **Stratified Random Sample**
 - population is separated into strata (or groups)
 - each strata is randomly sampled
 - ensures that we have enough in each group for statistical analysis
 - likely to need a larger sample than for simple random sample

Example: Population of graduates stratified by gender
A random sample of men and a random sample of women are selected

Simple Random Sample In Each Stratum



Types of Random Samples

- **Cluster Samples**
- Useful when you don't have a complete listing of the entire population.
 - If you want to survey parents of primary school children in your country, you probably don't have a list.
 - Randomly select schools
 - Obtain list of parents by schools
 - Randomly select parents

Random Sampling Issues

- What is your population of interest?
 - who, how many
- How important is it to be right?
 - confidence level
- How important is to be precise?
 - sampling error/ confidence interval

Samples are Imperfect

- Samples have a probability of error.
- Statisticians have figured out how to estimate that probability.
- **Statistics:** estimates for the probability that the sample results are representative of the population parameter as a whole.

Samples are Imperfect

- How **confident** do you want to be that your sample is reasonably accurate?
- Standard is a 95% confidence level:
 - means that 19 out of 20 samples would have found similar results
 - means that we are 95% certain that the sample results are an accurate estimate of the population

Samples are Imperfect

- How **Precise** do you want to be in your estimates?
- **Survey results:**
 - 45% oppose building a dam and 55% favor building a dam.
 - The margin of error is $\pm 3\%$.

No

42% - 45% - 48%

Yes

52% - 55% - 58%

Samples are Imperfect

- The social science standard for confidence interval is $\pm 5\%$.
- **Survey results:**
 - 45% oppose building a dam and 55% favor building a dam.
 - The margin of error is $\pm 5\%$.

No 40% - 45%	50%	Yes 55% - 60%
------------------------	-----	-------------------------

Samples are Imperfect

- **Confidence Interval** is another way to estimate precision.
 - It is used when working with real numbers, such as age or salary.
 - The average salary of the respondents is \$20,000, and the Confidence Interval is \$18,000 - \$22,000 ($\pm 5\%$).

Sample Size

- Sample size is a function of:
 - population size
 - the desired confidence level
 - acceptable margin of error
- In general, accuracy and precision is improved by increasing the sample size.

Sample Size

- Sample sizes is proportionately larger when the population size is small.
- Based on 95% confidence level, with $\pm 5\%$ sampling error
 - If the population is 100, then the sample size would be 80.
 - If the population is 1,000, the sample size would be 278.

Sample Sizes for Large (Infinite) Populations

Margin of Error	Confidence Level		
	99%	95%	90%
$\pm 1\%$	16,576	9,604	6,765
$\pm 2\%$	4,144	2,301	1,691
$\pm 3\%$	1,848	1,067	752
$\pm 5\%$	883	384	271

Survey Sampling issues to Consider

- The standard confidence level is 95%. Sometimes a 90% confidence level is acceptable.
- Commonly, a ± 5 point precision range is used; but we may prefer a ± 3 point range.
- Focus on obtaining good response rates.
- Sometimes, a low response rate can be acceptable.

Sample Size versus Confidence Interval and Precision Range

<u>Precision</u>	<u>95% Confidence</u>	<u>90% Confidence</u>	<u>Reduction in Sample Size</u>
± 3 percentage points	1,000	800	20%
± 5 percentage points	400	290	28%
Reduction %	60%	64%	71%

How Large a Sample Do You Need?

Population Size	Sample Size	Population Size	Sample Size
10	10	550	226
20	19	600	234
40	36	700	248
50	44	800	260
75	63	900	269
100	80	1,000	278
150	108	1,200	291
200	132	1,300	297
250	152	1,500	306
300	169	3,000	341
350	184	6,000	361
400	196	9,000	368
450	207	50,000	381
500	217	100,000+	385

Source: R. V. Krejcie, and D. W. Morgan, "Determining Sample Size for Research Activities", *Educational and Psychological Measurement*, Vol. 30: 607-610, 1970

Sample Size

- Accuracy and precision can be improved by increasing sample size. In other words:
- By increasing sample size, we increase accuracy and reduce margin of error.
- The standard we should aim for is a 95% confidence level and a margin of error of +/- 5%.
- The larger the margin of error, the less precise your results will be.
- The smaller the population, the larger the needed ratio of the sample size to the population size

Non-Random Sampling

- **quota:** a sample in which a specific number of different types of units are selected. For example, you may want to interview 10 teachers and decide that five will be men and five will be women.
- **snowball:** this type of sampling is used when you do not know who or what you should include. Typically used in interviews, you would ask your interviewees who else you should talk to. You would continue until no new suggestions are obtained.
- **judgmental:** in this kind of sample, selections are made based on pre-determined criteria that, in your judgment, will provide the data you need. For example, you may want to interview primary school principals and decide to interview some from rural areas as well as some from urban areas (but no quota is established).
- **convenience:** in this type, selections are made based on the convenience to the evaluator. Principals from local schools may be selected because they are near where the evaluators are located.

Non-Random Sampling

- **Potential Bias**

- Were these people selected in a biased way?
- Are they substantially different from the rest of the population?
- It helps to collect some data to show that the people selected are fairly similar to the larger population (e.g. demographics)

Non-Random Sampling

- The results of non-probability samples cannot be generalized
 - Data is reported in terms “Of the respondents....”
- Sample size not that important
 - Enough so it seems reasonable
 - Enough to ensure variation

Exercise 6.1

- Which of the following is a **list of the types of random samples**?
 - a. simple, stratified, cluster
 - b. quota, stratified, snowball
 - c. cluster, accidental, quota
 - d. stratified, convenience, cluster

Exercise 6.2

Which of the following is a definition of **quota sampling**?

- a. selecting source of data from whoever walks by
- b. selecting source by setting criteria to achieve a specific mix of participants.
- c. selecting source by setting number from each subunit within the population
- d. selecting source from whoever is easiest to contact or whatever is easiest to observe