

# **Data Collection Tools Development:**

## **Quantitative data**

**First Training Workshop on Research Capacity  
Strengthening and Proposal Development for  
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## **What is data?**

- numerical facts collected together for reference or for information
- observations or measurement characteristics of person, objects, etc.
- actual measurement

## Variables → Data

### Examples

(i) Age of a child = variable

→ 10 years = age data of the study population

(ii) Sex = variable

→ male / female (Data)

## **What is data collection?**

- A process of gathering and measuring information on targeted variables in an established system to answer relevant questions and evaluate outcomes

## **Why do we need data collection methods?**

- allow systematic data collection about objects of study  
(people, households, RHC, etc.)
- certain set of facts are collected about a large no. of  
persons

## **Quantitative data**

- measures of values or counts
- expressed in numbers and statistics
- data about numeric variables

e.g., how many, how much or how often

## Types of Quantitative data

(i) Secondary data

(ii) Primary data

## **Secondary data**

- Use available information
- A large body of data already collected by others
- It may not necessarily have analyzed or published
- Need to locate sources and retrieve the information

### ***Types of secondary data***

- Census data
- Unpublished reports
- Hospital records
- Information routinely collected by others such as researchers, anthropologists, HMIS data, etc.



## **Sources of published secondary data**

- Government publications
- Publications of UN, INGOs, etc.
- Journals
- Books, magazines, newspapers
- Reports
- Thesis
- Statistical year book
- Public records, historical documents
- Etc.

## **Source of unpublished secondary data**

- Diary
- Letters
- Unpublished biographies, auto-biographies
- Etc.

## *Caution when using secondary data*

- Reliability of data
  - Suitability for data relating to the study under problem
  - Adequacy of data
- missing required or lack of data such as interested years / age group, etc.

## **Primary data**

- Original in character
- Provide first-hand information or direct evidence of event

## *Quantitative data collection tools for primary data*

- Interview methods (Questionnaires)
- Self-administered questionnaires
- Mail questionnaires
- Structured Observation checklist
- Electronic data capture
- Web-based questionnaires
- Performance based instruments
- Through schedules (proforma)
- Etc.

# 1. Interview methods

## *Personal interviews (FTFI)*

- useful when researcher is relatively knowledgeable about expected answers and when no. of respondents being interviewed is relatively large
- use a questionnaire with a fixed list of questions in a standard sequences
- interviewers can probe for responses
- interviewers and respondents can clarify uncertainties
- more complicated and detailed questions can be asked
- no literacy requirements for respondents

## 2. Self-administered questionnaire (SAQ)

- administering written questionnaire
- answer by respondents in written form
- useful in collection of data on sensitive topics  
e.g., opinion on supervision, use of drug, etc.
- instructions or questions are more likely to be misunderstood without an interviewer to help explain them
- portions of questionnaire are more likely to be left blank
- difficult to incorporate many conditional sequences of questions (skip questions)

# Ways of gathering data by Self-administered questionnaire

(i) Gather respondents in one place at one time

- give oral or written instructions
- 2 ways of recording the questionnaire
  - ❖ respondents fill out the questionnaire and may help them in recording their answers
  - ❖ questions are filled in by the interviewers

(ii) Hand-deliver questionnaires to respondents and collect later

(iii) Mailing

(iv) Online

## **Types of questionnaires**

- Structured
- Un-structured
- Semi-structured



## Structured questionnaires

- appropriate when straight forward factual information are desired
- fixed-standardised questions
- close-ended answers
- pre-coded response choices
- presented to respondents in the same way, no variation

## *Example*

Result of the interview (Circle the appropriate code)      |\_ |

1 = completed

2 = partially completed

3 = refusal

4 = not at home

5 = no eligible age group at home

## Unstructured questionnaires

- a combination of fixed questions
- allows the interviewer to probe
- enable the respondent to raise other relevant issues
- use open-ended questions

### *Example*

What is your opinion on services provided at this health centre?



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## **Semi-structured interview**

- ask a certain no. of specific questions
- additional probes are allowed and encouraged
- include both open- and closed-ended questions

## *Example*

Result of the interview (Circle the appropriate code)

1 = completed

2 = partially completed (please specify)

3 = refusal

4 = not at home

5 = no eligible age group at home

Reason for partially completed

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## **Example**

### **Objective**

To determine TB Knowledge, Attitude and Practices of urban community members

Source: WHO. 2008. A guide to developing  
Knowledge, Attitude and Practice Survey

## Background characteristics

1. Age (completed years) ----- |\_|\_|

2. Sex |\_|

1 = male                      2 = female

3. Marital status |\_|

1 = unmarried (skip to Q 5)      2 = married (go to Q4)

4. How many children do you have? ----- |\_|\_|

5. Occupation |\_|

1 = Dependent

2 = Government staff

3 = Private Company staff

4 = Odd jobs

5 = Other (Specify) -----

# Knowledge

1. How can a person get TB? (allow more than one response)

Through hand shakes

Through the air when a person with TB coughs or sneezes

Through sharing dishes

Trough eating from same place

Through touching items in public places (door knobs, handles in transportation, etc.)

Don't know

Other (Specify) -----



## Attitude about TB transmission

1. Which statement is closed to your feeling about people with TB disease?

(Read the following choice and circle one of the answers)

1. Feel compassion and desire to help
2. Feel compassion, but I tend to stay away from these people
3. It is their problem and I cannot get TB
4. I fear them because they may infect me
5. I have no particular feeling
6. Other (specify) -----

## Alternative way to ask Attitude using Likert Scale

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1					
2					
3					
4					
5					

## Care seeking behavior for TB

1. Do you think you can get TB?

1 = yes (go to Q2)                      2 = no (go to Q 3)

2. What would you do if you thought you had symptoms of TB? (allow more than one answer)

Go to hospital

Go to pharmacy

Go to traditional healer

Pursue other self-treatment options (herbals), etc.

Other (specify) -----

### **3. Structured observation checklist**

- use when research issues of interest are well-established and can be clearly specified
- researcher directly observes some phenomenon at a given moment in time
- use detailed structured observation checklist

## Example of Structured observation check list

Please tell me if the following resources / supplies used for infection control are available in general outpatient area of this facility today.

(Ask to see the items)

Items	Observed	Reported not seen	Not available
Clean running water (piped, bucket with tap, or pour pitcher)	1	2	3
Hand washing soap / liquid soap	1	2	3
Sharp container (safety box)	1	2	3

*Source: Nation-wide Service Availability and Readiness Assessment (SARA),*

*Myanmar, 2015*

# Questionnaire design

- ask only questions relevant for your research
- avoid duplications
- clear instructions what the respondent needs to do  
(e.g. circle, underline, write)
- exclude leading questions
- do not include two questions in one
- do not split the question and the answer on 2 pages
- do not use professional jargon
- in close ended questions, wherever possible, offer an open-ended answer

## Contd. Questionnaire design

- follow some logical order

(Introduction – socio-demographic data, K, A, P, etc.

→ divide sections by sub-headings)

- start with the most straightforward questions
- the least sensitive questions at the beginning
- more difficult towards the middle part
- finish the questionnaire with easy questions

# Coding

- think about coding for data entry process when designing questionnaire
- can assign numbers to close-ended answers
- list of codes to be prepared for open-ended questions following the completion of interviewing of all study participants



# Choosing the appropriate data collection tool

Depends on

- Objective of study
- Study participants
  - patients, community, health providers, etc.
- Education level
  - literate or illiterate
- Required types of information
  - sensitive or common / mutual information

## Pretesting the questionnaire

- done with sample from the group with same characteristics of main study population
- discuss with the group their responses
- is each question measuring what is intended
- the understanding of wording
- the understanding of instructions
- comprehensiveness of close-ended answers
- comprehensiveness of the questionnaire
- layout of the questionnaire

<b>Quantitative data collection techniques or methods</b>	<b>Data collection tools</b>
<b>Using available information</b>	<b>Checklist, Data compilation forms</b>
<b>Interviewing (FTFI , Telephone)</b>	<b>Questionnaire</b>
<b>Administering written Questionnaires (SAQ, Mailing, Online)</b>	<b>Questionnaire</b>

<b>Quantitative data collection techniques or methods</b>	<b>Data collection tools</b>
<b>Structured Observation</b>	<b>Eyes and other senses, Pen/paper, Checklist, Watch, Scales, Camera, Video, Microscope, etc.</b>
<b>Clinical measurement (BP, weight, Height, etc. )</b>	<b>Eyes and other senses, Pen/paper, Checklist, Scales, etc.</b>
<b>Investigation (X-ray, CT scan, USG, etc.)</b>	<b>Instruments Eyes and other senses, Pen/paper, Checklist, Watch, Scales,</b>

## Examples

### Research questions and their corresponding Quantitative data collection methods and tools

Type of research questions	Qn. data collection methods	Qn. data collection tools
Events or patterns of cultural behaviour of treatment seeking for a child	FTFI Structured observation	Eyes, pen and paper, questionnaire, guideline, Observation checklist, camera
Knowledge of particular illness	FTFI	Eyes, pen and paper, questionnaire

# Summary

## Steps in designing a questionnaire / proforma

1. Think for objectives and variables
2. Decide the main section
3. Write out the questions
4. Sequencing the questions
5. Arrange compose a draft
6. Take out any questions that are not essential
7. **Pre test All necessary data collection tools (Questionnaire, Checklist, Instruments) before conducting the main survey**

*Thank you*