

# Data collection techniques

## Questionnaire design

In research investigations, information can be collected through the application of a variety of techniques:

- Observation,
- Questionnaires,
- Interviews,
- Direct physical measurement and
- The use of standardized tests.

# The approach selected depends on:

- The study objectives
- The study design
- The availability of time, money, personnel
- Whether the study is intended to produce relatively precise quantitative findings or to produce qualitative descriptive data.

# Data collection

## Quantitative data

- Structured interview
- Services statistics
- Self-administered questionnaire
- Secondary data sources
- Observation checklists
- Physical measurements

## Qualitative data

- Unstructured/semi structured interview
- Focus group discussion
- Directed observation of operations
- Content analysis of written materials

# Questionnaire Construction

- A questionnaire is a document designed with the purpose of seeking specific information from the respondents.
- Questionnaires are best used with literate people.
- The process of design and implementation is usually termed questionnaire construction.

# Steps of Questionnaire Construction :

1. The variables which are designed to measure should be listed
2. The researcher defines the information that is being sought.

- ✓ thinking and discussion.
- ✓ research objectives,
- ✓ discussions with others,
- ✓ reading and other sources.

At this stage, the document is typically a list of information yet to be translated into specific question form.

# Steps of Questionnaire Construction :

## 2. Drafting of the questionnaire.

- takes the list of information
- attempts to devise draft questions.
- ask more than one question to measure a single variable
- pay attention for the phrasing and design of the questions
- pay attention for the overall design of the questionnaire

If the questionnaire is **badly designed**, then the responses may not accurately reflect the real situation for the respondents, so, this will affect the **validity** of the obtained information.

# Steps of Questionnaire Construction :

## 3. Questionnaire piloting.

It is wise to pilot or trial a new questionnaire with a **small group** of the intended respondents and with clinical or research colleagues, in order to **improve its clarity** and **remove any problems**, before the main survey.



# Steps of Questionnaire Construction :

## 4. Redrafting of the questionnaire.

- ❖ If the pilot phase uncovers problems with the questionnaire, it will need to be redrafted in order to address these problems by making **modifications**.
- ❖ If they are of a **major** nature, it is usual to repeat the **pilot** phase.
- ❖ If they are **minor**, the researcher may make the changes, then **proceed** to administration of the questionnaire to the full sample of respondents.

# Steps of Questionnaire Construction:

## **5. Judge for validity of the questionnaire:**

- The easiest type of validity is to test face validity of the questionnaire through a review by judges (experts in the field of the study)
- The test is said to have face validity if it "looks like" it is going to measure what it is supposed to measure. It refers to what it appears superficially to measure.
- Face validity is often contrasted with Content validity.

# Steps of Questionnaire Construction :

## 6. Administration of the questionnaire.

**\*\*** After the questionnaire has been developed, and judged, it is administered to the full sample of respondents.

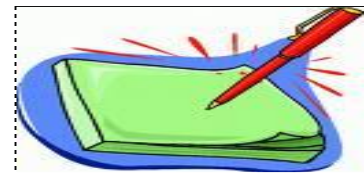
- **Notation:** the **ethics** of conducting surveys and designing questionnaires must be considered.

-clear aim   -anonymity   -confidentiality   -no harm

# The Structure of Questionnaires

## 1. **Covering letter & *Introductory statement*.**

- Identification of the sponsoring institution and the researcher.
- The name of the highly person or agency is a guarantee to the respondents that the project is worthwhile , that the data will not be misused , and the that confidentiality will be maintained.
- ➔ The covering letter is of value in gaining cooperation, introducing the questionnaire & the researcher to respondents.
- ➔ ***Introductory statement*** describes the purpose of the questionnaire, the information sought and how it is to be used, how the respondents were selected for the study and why their answers are important .



# The Structure of Questionnaires

2. **Demographic questions.** Position these questions first as they are easily answered and serve as a 'Warm-up'.
3. **Factual questions.** It is generally easier for respondents to answer direct factual questions, e.g. 'Do you have any chronic disease?' than to answer opinion questions, also to serve as a 'warm up'.
4. **Opinion questions.** They require reflection on the part of the respondent and are usually positioned **after** the demographic and factual questions.

# The Structure of Questionnaires

## 5. *Closing statements and return instructions.*

- **Thank** the respondent for their participation,
- Invite the respondents to take up any issues they feel have not been satisfactorily addressed in the questionnaire
- Provide information on **how to return** the questionnaire.

# **QUESTION AND QUESTIONNAIRE FORMATS:**

# Question and Questionnaire Formats:

The questionnaire may be formatted as :

- Interview schedule: (unstructured, semi-structured, structured)- Unstructured and semi-structured will results to a mixed method (qual and quan)
- Self administered questionnaire



# Questionnaires versus interviews

	Costs	Benefits
Interview schedule administered by interviewer	<ul style="list-style-type: none"><li>- Expensive to administer and time consuming.</li><li>- Requires expert help.</li><li>- Responses much more susceptible to interviewer bias</li></ul>	<ul style="list-style-type: none"><li>- Lower rejection rate</li><li>- More detailed responses and explanations can be elicited.</li><li>- Greater control over filling out of response form (can make sure that instruments are answered completely).</li><li>- Useful for illiterate people.</li></ul>
Self-administered questionnaire	<ul style="list-style-type: none"><li>- Higher rejection rate</li><li>- Difficult to elicit detailed responses.</li><li>- Less control over how response form is filled out.</li></ul>	<ul style="list-style-type: none"><li>- Cheap to administer.</li><li>- Less time consuming.</li><li>- Less susceptible to interviewer bias.</li><li>- Can be administered by mail.</li></ul>

# Benefits

## Interview schedule

- Lower rejection rate
- More detailed responses can be elicited
- Greater control over filling out of response form

## Self-administered questionnaire

- Cheap to administer
- Less susceptible to interviewer bias
- Can be administered by mail

# Costs

## Interview schedule

- Expensive
- Time consuming
- Require expert help
- Responses much more susceptible to interviewer bias
- Respondents modify their response to fit what they perceive to be the opinion of the interviewer

## Self-administered questionnaire

- Higher rejection rate, incomplete responses
- Difficult to elicit detailed responses
- Less control over how responses form is filled out
- Respondents are forced to answer, with little opportunity to influence the researcher's agenda.

# There are two major question formats:

## **The open ended question**

- No predetermined response schedule into which the respondent must fit their response.
- Questions that require short or lengthy replies by respondents.

## **The closed-response question:**

- Respondent is supplied with a predetermined list of response options.
- The question consists of fixed number of choices.

Format of questions	Costs	Benefits
<b>Open-ended</b>	<ul style="list-style-type: none"> <li>- Less structured.</li> <li>- Responses difficult to encode and analyze using powerful statistical methods.</li> <li>- Greater time taken by respondent to answer.</li> <li>- Respondent may find writing an essay more difficult than circling a number.</li> </ul>	<ul style="list-style-type: none"> <li>- More detailed answers elicited.</li> </ul>
<b>Closed-ended</b>	<ul style="list-style-type: none"> <li>- Less depth in answers (it does not allow for any answers other than the ones listed).</li> <li>- The potential responses listed by the researcher may not include an answer that is most appropriate for a particular respondent.</li> <li>- May frustrate respondents.</li> </ul>	<ul style="list-style-type: none"> <li>- Tightly structured</li> <li>- Responses easily encoded and analyzed</li> <li>- Less time taken to collect responses.</li> <li>- Quicker and easier to answer.</li> <li>- well suited for use in multi-item scales designed to produce a single score</li> </ul>

- To ensure accurate and standardized responses, all questionnaire **must have instructions specifying how they should be filled out.**
- Provide **an example** of how to complete a question, using a simple question that is easily answered.
- To improve the flow, questions concerning major areas should be **grouped together** and introduced by headings or short descriptive statements.
- For each question or set of questions, particularly if the **format differs** from that of other questions , instructions must indicate clearly how to respond.

- If the instructions include different time frames, it is sometimes useful to repeat the time frame at the top of each new set of questions.
- E.g.:
  1. How often have you visited a doctor during the past year?
  2. How many times have you been treated as a patient in an emergency department during the past year?
  3. During the past year, how many times were you admitted to the hospital?
- **can be shortened as follows:**

During the past year, how many times have you

  - a. Visited a doctor?
  - b. Been a patient in an emergency department?
  - c. Been admitted to a hospital?

- It is best to avoid complicated structures involving conditional questions which usually confuse respondents and ought be avoided where possible.
- For example, many conditional questions such as 'If you answered yes to Question 6 and no to Question 9, please answer Question 10'.



# Format

- A neat format with plenty of space is more attractive and easier to use than one that is crowded or cluttered.
- Although investigators often assume that a questionnaire will appear shorter by having fewer pages, the task is more difficult when more questions are crowded onto a page

## Branching question.

- Sometimes the investigator may wish to follow up certain answers with more detailed questions. This is best accomplished by a **branching question**.
- Have you ever been told that you have high blood pressure?  
☐ Yes    ☐ No
- If yes, how old were you when you were first told that you had high blood pressure?  
\_\_\_\_\_ years old  
If no, go to question 11.

# Branching question.

- **Branching questions** save time and allow respondents to avoid irrelevant or redundant questions.
- Directing the respondent to the next appropriate to follow-up questions include directions such as "Go to question 11"

- Sometimes it is helpful to provide an example of how to complete a question, using a simple question that is easily answered

Example 1. Instructions on How to Fill Out a Questionnaire that Assesses Dietary Intake (from the Study of Osteoporotic Fractures).

These questions are about your usual eating habits during the past 12 months. Please mark your usual serving size and write down how often you eat each food in the boxes next to the type of food.

For example, if you drink a medium (6 oz.) glass of apple juice about three times a week, you would answer:

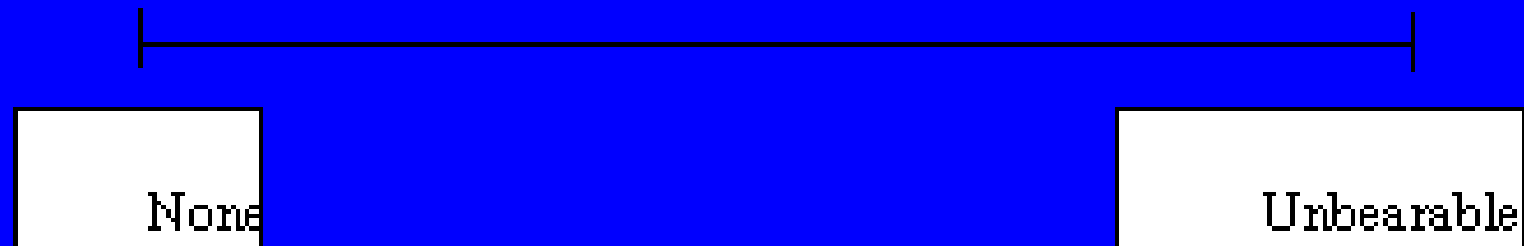
Apple Juice	<input type="checkbox"/> Small (3 oz)	<input type="text" value="3"/>	time(s) per	<input type="checkbox"/> Day
	<input checked="" type="checkbox"/> Medium (6 oz)			<input checked="" type="checkbox"/> Week
	<input type="checkbox"/> Large (9 oz)			<input type="checkbox"/> Month
				<input type="checkbox"/> Year

# **Closed- ended questions' responses**

- The response categories must be mutually exclusive and exhaustive: the respondents must be able to choose one and only one alternative ; but the alternative must be appropriate for each respondent . There are different types- responses of Closed- ended questions such as the following:
  - **Yes-no question**
  - **Completion items**
  - **Matching items**
  - **Multiple choice question**
  - **Likert scale :**
  - **Rating scales:**
  - **The visual analog scale (VAS)**

## Example 2. Example of a Visual Analog Scale for Rating the Severity of Pain

1. Please use an X to mark the place on this line that best describes the severity of your pain in general over the past week.



A participant might answer as follows:



This is a 10-cm line, and the mark is 3.0 cm from the end (30% of the distance from none to unbearable) so the respondent's pain would be recorded as having a severity of 3.0, or 30%.

## Likert formats:

- These are commonly used to attitudes, behaviors, and domains of health-related quality of life.

**responses.....1-5/ 1-7**

- strongly agree
- agree
- neutral
- disagree
- strongly disagree

## Open-ended questions:

- Open-ended questions are particularly useful when it is important to hear what respondents have to say in their own words.
- Provide enough space for the respondents to respond adequately
- People with visual problems, including many elderly subjects, will appreciate large type (e.g., font size 14) and high contrast (black on white).



# The wording and design of questions

- The writing of good questions is an art, and a time consuming art. well-worded questions are needed for valid and reliable responses. There are a number of pitfalls to be avoided:

**1. *Double-barrelled questions.*** This is where two questions are included in the one, 'Do you like maths or science?', for example. These questions should be separated so that it is perfectly clear to the respondent (and the researcher) which component is being answered.

**2. *Ambiguous questions.*** Avoid vacuous words and terms that may mean different things to different people.

– For example, 'old people'

**3. *Level of wording.*** It is important to tailor the level of wording of questions to accord with the intended respondents.

- Avoid **Jargon**, and it should be established in the pilot study that the respondents will understand the concepts.
- Using double negatives should be avoided. In general, questions should be simple and concise.

**4. *Bias and leading questions.*** The wording of the question should not lead the respondent to feel committed to respond in a certain way.

**For example,** a questionnaire on health workers' attitudes to abortion might include the questions 'Do you value human life?' followed by 'Do you think unborn babies should be murdered in their mothers' wombs?'.

- In this case, the respondent is being led both by the context in which the second question is asked and the bias involved in the emotional wording of the questions..

- 5. Sensitive questions:** is the question asked in such a way that the respondents may become embarrassed , angry , emotionally upset ?
- 6. Jargon filled question :** does the question use professional , technical , or slang terms with which the respondents are not familiar ?
- 7. Complex question :** does the question use long phrases and complex sentences?
- 8. Inappropriate question :** does the question assume prior knowledge inappropriate to the sample?

## Positive characters:

- Clarity : can the question be interpreted in more than one way ?
- Brevity : can the question be shorted and still retain its meaning?
- Simplicity : is the vocabulary at a simple level ( such as that of a newspaper) which is appropriate to the study sample?
- Applicability: can the respondents in the study sample be reasonable expected to answer accurately ?

# Inducement to respond

- Researchers have tried a number of approaches to encourage participation in the study as,
- a small pencil with which to write
- a coin as an incentive
- or promise that the results will be sent to respondents who request them
  - the most effective seems to be an appeal to the respondents' altruistic nature , by indicating the goal that the study may accomplish.
    - The questionnaire physical appearance is also important in eliciting good return . the questionnaire should be : Attractive, With reasonable length, Appropriate size, and inviting color and lining spacing

# Inducement to respond

- Color should be pre-tested for effectiveness , but in general , lighter colors especially yellow and pink ' have been found to elicit the highest percentage of return .
- A page of closely typed lines and questions may immediately discouraged the respondents.
- Hand delivery of the questionnaires may be an important way to stimulate response.
- If the questionnaire is mailed , a follow up mailing may be an effective method to stimulate returns that are forthcoming