

Chapter 10

Questionnaires

The questionnaire is a device for gathering research data. In order to obtain accurate, valid and reliable responses it is necessary to have a well-designed questionnaire.

Self-administered questionnaire and **interview** are the two most commonly employed methods for gathering information from subjects. One advantage with the self-administered questionnaire is financial. There is a marked reduction in costs because of savings in the number of interviewers to be employed, and in time. There is the additional advantage of standardized response, because the variability imposed by differences in interviewing techniques and interaction between the subject and the interviewer are eliminated. The respondent is able to answer in the privacy of own home and at leisure, thereby giving more candid answers. One problem with this method is that it can be used only in situations where literacy rates are sufficiently high and postal services are reliable. The disadvantages are higher rejection rates, the inability to obtain clarifications or details, and less control over how the form is filled.

Both the self-administered questionnaire and the interview method are susceptible to errors caused by imperfect memory, limited powers of observations, and respondents' desire to give socially acceptable answers.

The advantages of the interview method are that the rejection rate is lower, more detailed responses can be elicited if necessary, and the filling out of the form is in the control of the interviewer. The disadvantages are the costs in time and personnel, and that the responses are more susceptible to interviewer bias.

Designing Questionnaires

The main considerations before commencing the development of a questionnaire are the following:

- 1). Does a suitable questionnaire already exist?

This particularly applies to scales for measuring moods, feelings, symptoms (e.g. pain), behaviour, and so on. Some of these issues are considered later in the chapter, but as a general principle it is better to use a properly validated and standardized measure like Rutter's Behaviour Scale for Primary School Age children than to construct a new measure which has not been field tested.

2). Who will fill the questionnaire?

The perspectives of parents may be different from those of health workers or teachers, and individual patients have different views from those of family members caring for them. The language used in the questionnaire should be such that the reading ability of the informant is not taxed. In countries with low literacy levels it is important that the language is kept simple and the sentences short so that the subject matter of the questions is well understood.

3). What format will be used?

Open-ended or closed are the common formats. In addition, different scales may be employed for assessing response.

Steps in the construction and use of questionnaires

Developing and implementing a questionnaire involves the following steps:

- 1). Definition of the topics to be covered, followed by a detailed outline of the information that will be needed to answer the research question. A list of variables is then prepared in accordance with the information outline. At this stage it is useful to think ahead about analysis and reporting, so that all items that would be necessary to answer the research question are included.
- 2). First draft of the questionnaire is prepared, organizing the questions by topics, and the topics in a way that would maintain the flow of thought.
- 3). The questionnaire is revised, and words or phrases that are not likely to be understood by even a few respondents are removed. Short sentences, and simple language without any jargon make good questionnaires.
- 4). Pre-testing of the questionnaire. (Also called piloting). This is usually done with subjects from the same population on whom the questionnaire is to be used. Further sorting out of wording and language is done following the pre-testing. Another very useful purpose of pre-testing is to look for redundant information, e.g. questions that produce similar information.
- 5). The questionnaire is redrafted. If circumstances permit another larger pre-test is carried out using the same respondents at different times, or different interviewers to check for the reliability of the answers.
- 6). The final draft is prepared. Sometimes if a sufficiently large number of subjects have been used in the pre-test, analytical methods like Factor Analysis may be employed to weed out some more questions. In order to decide whether an item should be included, the researcher must

think how the data would be used for analysis and reporting. If in doubt, the item is best left out. One should avoid the temptation of including questions on the basis of "just in case". Before finalising, the draft it is useful to think about possible 'confounders'. One strategy for Dealing with 'confounders' at the analysis stage is to perform stratified analysis. This would not be possible if information about possible 'confounders' has not been gathered.

7). A coding scheme for coding the answers is next prepared. A code like '9' or "99" needs to be decided beforehand for missing data. Similarly, the same numeric code should be decided for "Don't know" answers.

8). Administering the questionnaire.

Formats

Open ended and closed response are the two major formats. For example, "What do you feel about using the oral rehydration solution in the management of diarrhoea?" is open-ended. And, "How would you rate oral rehydration solution in the management of diarrhoea? excellent __; good __; moderately good __; fair __; poor __; "is a closed response.

Open-ended has the advantage of eliciting more detailed answers. The respondent is free to answer without limitations imposed by the interviewer. The disadvantage is that the answers are difficult to code; greater time is taken in filling the questionnaire; respondents get tired; answers cannot be analyzed well.

Closed response questions have the advantage of being tightly structured; response is easy to code and analyze; less time is taken in filling the questionnaire. The disadvantages are that the answers have less depth. The respondent is led in pre-determined direction leaving him less choice to express his own potentially unique answers. Moreover, the answers listed in the questionnaire may not be among the answers applying to a particular respondent. One way out of the difficulty is to do a pre-test first using open-ended questions, and from the answers received develop a close-ended format. Alternatively, an option may be included like "Others (please specify); or "none of the above."

Format for closed-response questions.

It helps to provide numbers for the respondent to circle, or boxes to tick. The response categories should be mutually exclusive so that the respondent will select only one answer. If the question allows more than one answer it is best to ask the respondent to mark each possible response as either "yes" or "no".

e.g. What foods did you use for weaning your child

- a). Cow's milk.
- b). Formula
- c). Porridge.
- d). Egg.

can be written as:-

What foods did you use for weaning your child

	Yes	No	Don't know.
a). Cow's milk	[]	[]	[]
b). Formula	[]	[]	[]
c). Porridge	[]	[]	[]
d). Egg	[]	[]	[]

Measuring attitude

The usual way of assessing attitude is by means of a scale. Some scales have been extensively tested in a variety of settings and are widely used e.g. Rutter's Behaviour scale for children, the General Health Questionnaire, and so on. Others, more simple ones may need to be constructed depending on the research question. For example, in a study of food habits and taboos in pregnancy the researcher may wish to assess prevailing attitudes.

For assessing attitude two formats are commonly employed viz. the Likert and the Guttman Scale. An example of the **Likert scale** is given below:

" For each item tick (/) a line that best represents your opinion:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	(1)	(2)	(3)	(4)	(5)

Cigarette advertising should not be allowed at sporting events

---	---	---	---	---
-----	-----	-----	-----	-----

Cigarette advertising should be banned in public places.	---	---	---	---	---
Cigarette advertising should be prohibited by law	---	---	---	---	---

A score is computed by adding up the points for each item. The Likert Scale thus helps to quantify behaviour and attitude. The assumption is that each item is measuring the same characteristic. The problem is that the same total score can be arrived at in several different ways, and identical scores may have different meanings. It is the pattern of response that conveys more information than the total score.

The **Guttman scale** consists of statements that express increasing intensity of a characteristic. The respondent is asked to agree or disagree with each statement, as follows:

- Smoking can cause illness (a).
- Smoking is an important cause of illness (b).
- Smoking is a very important cause of illness (c).
- Smoking is the most important cause of illness. (d).

The score is computed by counting the total number of items with which the respondent agrees or disagrees.

Guttman Scale helps to check answers for consistency. If a person agrees with say statement b), he would be expected to also agree with a). If he disagreed with statement c) he would be expected to disagree also with d).

The **Visual analogue scale** consists of 10cm. lines, the ends of which represent extremes of the item being measured. The respondents are asked to mark along the line where they think their situation lies between the two extremes e.g.

How severe has your pain been since last visit?



Measuring behaviour

In order to measure behaviour it is essential to have the respondent describe it in terms of some unit of time e.g. "usual" or "typical" behaviour. Choosing the time period involves some form of trade-off. Focusing on a recent brief period of time e.g. in nutritional studies the intake of different items of food and the amounts consumed during the previous three days is usually asked for. This has the advantage of improving recall, but may not be typical of the rest of the year.

Sometimes it may be necessary to decide beforehand what is important from the point of view of the study - average or extreme. For example in a question concerning disciplining of children in a study about child abuse the question may be worded as "How is the child usually punished for disobedience?" and "How is the child punished for being persistently disobedient?"

The wording of questionnaires

In writing the questions a number of pitfalls should be avoided as follows:

The format should be neat, with clear wording which is easy to understand. Ambiguous questions, or those containing complex language or jargon should be removed. Biased and leading questions should be avoided. Maintaining neutrality is necessary to avoid introducing bias. Usually respondents like to give answers that are considered acceptable, and what the interviewer would be pleased with. Double-barrelled questions i.e. questions containing words like "or" and "and" should be broken up into two or more specific questions. For example, "Do you like tea or coffee?" should be broken into

"Do you like tea?"	[Yes]	[No]
"Do you like coffee?"	[Yes]	[No]

Technical terms and jargon cause a great deal of confusion, and careful editing of the questionnaire is needed to weed them out.

Administering the questionnaire

The objective is to gather the desired information fully from the respondent and record it without errors. Missing data make the results not truly representative, in addition to making analysis difficult. To avoid this not only should the questionnaire be well designed but also administered well. All answers should be checked before leaving the subject. All answer sheets should be reviewed at regular intervals (say twice a week) during the course of the study, and checked for errors.

Interview procedures should be standardized from one subject to another in order to maximize reality. For probing all the wording and procedures should be uniform in order to avoid bias. Finally, it must be remembered that gestures and body language are also an important part of the interview procedures.

As research progresses one is inevitably getting tired and boredom begins to creep in. Hence standardization of all procedures and methods is necessary to maintain reliability, including when and how to use probing questions.

Validity and Reliability

This often gets neglected. The questionnaire is an instrument designed to bring forth the desired information. Validity seeks to check whether relevant questions about the research topic are being asked, and whether sufficient areas are covered. Reliability seeks to check whether the information obtained is accurate and consistently so.