UNIT 1 QUANTITATIVE DATA COLLECTION METHODS AND DEVICES

Structure

1.1 INTRODUCTION

There are two types of primary research: one is done through quantitative data collection and the other, through qualitative data collection. Customarily, quantitative data collection means using numbers to assess information. As you are aware, some kinds of information are numerical in nature, for example, a person's age, or annual income. The answers to these questions are in numbers.

Quantitative data is used for testing of a hypothesis and drawing inferences. Quantitative data is collected by using the following two set of data resources:

i) Primary data

ii) Secondary data.

In this unit, we will discuss in detail, methods of collecting primary and secondary data, along with the advantages and disadvantages of the methods.

After reading this unit, you should be able to

- explain the primary data collection methods
- discuss the questionnaire and interview methods of data collection
- describe secondary methods of data collection

1.2 PRIMARY DATA COLLECTION: MEANING AND METHODS

Data which are originally collected by the investigators are called primary data, while the secondary data are collected through some other sources. For example, information collected by an investigator from a student regarding his class, caste, family background, etc., is called primary data. On the other hand, if the same information collected about the student from the school record and register, then it is called secondary data.

However, the difference between primary and secondary data is largely of degree, and there is hardly any watertight difference between them. The data collected through primary sources by one investigator may be secondary in the hands of others. For example, field data collected by an investigator for writing his thesis is primary to him, and when the same data is used by another investigator, for reference purposes, then it became secondary data. Let us discuses the methods that are used to collect primary and secondary data.

There are various types of quantitative primary data gathering tools, but the important ones among them are:

- The Questionnaire
- The Interview Schedule

1.3 QUESTIONNAIRE METHOD OF DATA COLLECTION

Questionnaires are a popular method of data collection. Although they look easy, it is difficult to design a good questionnaire. Careful design of a questionnaire is vital for the collection of required facts and figures. Any frivolous attempt in framing a questionnaire will lead to either shortage, or, collection of unnecessary information neither of which will be useful to your research. Questionnaire design depends on whom, and, from where information has to be collected; what facts and figures need to be collected; and the calibre of the informants.

The questionnaire can be broadly categorized into two types:

i) structured questionnaire

ii) unstructured questionnaire.

i) **Structured questionnaires** are prepared in advance. They contain definite and concrete questions. The structured questionnaire may contain close ended questions and open ended responses. In the close ended questionnaire, the question setter gives alternative options for which the respondent has to give definite response. The best example of the close ended questionnaire format is the one that leads respondents to the "Yes" or "No"/ "True" or "False" answers.

ii) **Unstructured questionnaires** are those that are not structured in advance, and the investigators may adjust questions according to their needs during an interview.

1.3.1 Methods of Data Collection Using Questionnaires

Questionnaire methods are conducted in different ways. A few important methods are outlined here.

i) **Personal Interview**

In personal interviews, the interviewer or investigator personally approaches the interviewee and administer questions. This method is largely followed in research and the accuracy of data is very high. However, it is an expensive method.

ii) **Mail Questionnaire**

In this method, the investigator mails the questionnaire to respondents and respondents are requested to fill it up and return it to the investigator. In many cases, a self addressed stamped envelope is sent along with the questionnaire to facilitate the the return of the questionnaire mail immediately. This method is usually adopted where the respondents are widespread and the investigator has limited resources to approach them. The success of this method depends of the literacy level of the respondents and the accuracy of the address database. One of the drawbacks of this method is that, sometimes, the respondents do not take the questionnaire seriously, and, as a result the answer may not be accurate.

Implementing a Mail Survey

- Design a written questionnaire with identification number.
- Pretest questionnaire to assure validity and reliability.
- Select sample population.
- Two weeks before mailing the survey, send an advance letter
- Mail the questionnaire including a cover letter and a stamped, self-addressed envelope
- Send a postcard a week or so later, thanking those who responded and reminding those who did not return the questionnaires
- Three weeks after mailing the first questionnaire, send a follow-up letter stating that a response has not been received, including a replacement questionnaire and a stamped, self-addressed envelope.
- In developing the mailing schedule avoid holidays.
- For most purposes, a 60 to 90 percent return rate is considered satisfactory.

(**Source :** Suvedi et.al., 2008)

iii) Telephone

In this method, the investigator administers a questionnaire by seeking responses from the respondent over the telephone. It is largely administered to the urban respondents where telephone facilities are widely available. However, the success of this method depends on the availability of telephone with the respondents. It is also expensive as well.

Implementing a Telephone Survey

- Arrange the facilities for survey.
- Identify the sample and their telephone numbers.
- Send an advance letter if addresses are available with information on when you will be likely to contact respondents, during working or non-working hours and how much time you need.
- Prepare well on the background information about the survey to answer respondents questions, if any.
- Develop an interview schedule.
- Decide on the number of calls to make to each number. In local surveys six to seven calls are customary.
- Decide how to handle refusals.
- Stick to the time schedule

Sample Call Sheet for Telephone Interviews

A call-sheet is used for each number chosen from the sampling frame. The interviewer records information that allows the supervisor to decide what to do with each number that has been processed. Call sheets are attached to questionnaires after an interview is completed.

Telephone Interview Call Sheet

Survey title : ....

Questionnaire identification number ....

Area code & number ( ) .... & ....

Contact attempts	Date	Time	Result code & comments	Interviewer I.D.
1				
2				
3				
4				
5				
6				
Additional comments				

Code	Result Codes
	No answer after seven rings
	Busy, after one immediate redial
	Answering machine (residence)
	Household language barrier
	Answered by nonresident
	Household refusal
	Disconnected or other non-working number
	Temporarily disconnected
	Business or other non-residence
	No one meeting eligibility requirement
	Contact only
	Selected respondent temporarily unavailable
	Selected respondent unavailable during field period

	Selected respondent unavailable because of physical/mental handicap
	Language barrier with selected respondent
	Refusal by selected respondent
	Partial interview
	Respondent contacted - completed interview
	Other

Sample Help Sheet for Interviewers

Name of sponsoring agency:	
Purpose of study:	
Contact person for survey:	
Size of survey:	
Identity of interviewer:	
How respondents name was obtained:	
Issues of confidentiality:	
How to get a copy of results:	
How will results be used:	
(**Source :** Suvedi et.al., 2008)	

iv) E-Mail

With the IT revolution, nowadays, questionnaires are attached to the e- mails and sent to respondents who send an answer through return e-mail. The success of this method depends on the availability of internet facilities.

1.3.2 Qualities of a Good Questionnaire

Questionnaire framing is the most arduous task in social science research. Careful framing of questionnaires is essential to obtain reliable data,. Some of the principles that need to be taken into consideration while framing a questionnaire follow.

i) **It must be simple:** the questions must be simple and straightforward. They must also be short, which could be easily answered.

ii) **Begin with a covering letter:** the front page of the questionnaire must contain an introduction to investigator or institution collecting data, and the purpose of the quest. If the questionnaires are to be returned by mail, then, the address to which they are to be sent must be clearly mentioned.

iii) **The number of questions must be kept to a minimum:** the questions asked in the questionnaire must be kept to a minimum and restricted to the subject and topic of the study. Any questions which do not have direct bearing on the problem must be avoided.

iv) **Minimum use of Technical Terms:** try to avoid the technical terms as far as possible. If abbreviations are used, they need to be explained with illustrations, either separately or in the questionnaire itself. However, the investigator should be conversant about those technical terms.

v) **Questions must be logically arranged:** here lies the acumen of the investigator or question setter. He, or, she must arrange the questions in such a way that such questions should flow naturally from the answer to the previous question.

vi) **Avoid asking controversial questions:** do not include questions which are controversial in nature, or, are too personal or specific to community sentiments. Hypothetical questions, too, need to be avoided.

vii) **Pre testing of questionnaire:** before final administration, questionnaire need to be pre tested among a small number of respondents. This will give an opportunity to the investigator to rectify the problems, and, if required, any addition and deletion of questions.

1.3.3 Physical form of Questionnaire

While designing the questionnaire, the physical form of the questionnaire may be meticulously prepared. The following factors needed to be taken into consideration.

i) **Size:** the size of the questionnaire depends on the scope of the study. Adequate space should be provided for recording the comments and suggestions of the respondents. However, a single space is needed provide for recording the response. The Coding of questionnaire will reduced the need for space. Taking all these factors into consideration, the size of the questionnaire can be fixed, accordingly.

ii) **Quality of the paper**: good quality paper should be used in the question so that it lasts for a longer period. Except for the front page, white papers may be used in other pages.

iii) **Covering Letter**: Every questionnaire must have a covering letter. The purpose of the questionnaire must be clearly mentioned. Assurance should be given that the information gathered will be used only for research purpose, and be given confidential treatment.

1.3.4 Advantages of Questionnaires

The advantages of questionnaires are:

i) they are less expensive compared to the interview schedule and can be administered over a large number of respondents.

ii) they are less time consuming.

iii) since the interviewer is not present during the administration of a questionnaire, respondents may feel freer and have greater confidence in answering questions

iv) one of the advantages of the questionnaire method is that once it is standardized, then, the information collected from the respondents becomes more uniform.

1.3.5 Disadvantages of Questionnaire

Some disadvantages of questionnaires are :

i) In a questionnaire, there is no personal contact between the investigator and the respondents because of which clarifications on responses, if needed, cannot be sought.

ii) a questionnaire is not a suitable mode when a spontaneous answer is required through probing

iii) it is possible that the investigator may not get a response for all questions. Sometimes the responses may be vague and provide incorrect information

iv) there is the chance that information may be manipulated.

Sample Questionnaire

Indira Gandhi National Open University
School of Extension and Development Studies
PG Diploma in Urban Planning and Development

Title: Functioning of Primary School in Municipality

1) Name of the State ....

2) Name of the District ....

3) Name of the Block ....

4) Name of the Municipality ....

5) Name of the Teacher (Respondent) ....

6) Sex: Male/Female ....7. Age ....

8) Educational Qualification ....

9) Caste .... 10. Marital Status ....

11) Years of Teaching ....

12) Training received, if any ....

13) If yes, write the subjects taught in the training programme ....

14) Subject you are teaching

Mathematics ....

Science ....

Literature ....

Any other; specify ....

15) Medium in which you are teaching

English ....

Hindi ....

Any other, specify ....

16) In your opinion, which students were performing better in the class:

General Caste ....

SC ....

ST ....

Girls ....

Boys ....

17) Your interaction with the

Categories	Frequent	Occasional	Not at all
Parents			
Father			
Mother			

18) The role of municipality in your school management

Good ....

Average ....

Poor ....

19) Functioning of the Education Committee

Good ....

Average ....

Poor ....

Areas of their involvement ....

20) In your opinion, who are the real beneficiaries of education?

Economically Poor ....

Girl Children ....

Socially backward ....

All ....

21) Write the main problems of your School

1

2

3

22) What are your suggestions for improvement of the school conditions?

1

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3

In this section, you studied about quantitative data collection and the questionnaire method of data collection. Now, answer the questions given in *Check Your Progress-1*.

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What is primary data?

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2) What are the advantages of a questionnaire?

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1.4 INTERVIEW SCHEDULE

Interview schedule is a common practice in research. The schedule puts the whole thing in a structured form, so that the tabulation and analysis of data become easier. The basic difference between the schedule and the questionnaire is that in case of former, the presence of a field investigator or interviewer is a must, while the same may not be mandatory in the latter case. In other words, in the case of the interview schedule, the field investigator is an essential component. In other aspects, there is not much difference between the interview schedule and the questionnaire.

Some important aspects need to be taken into consideration in the preparation and execution of interview schedule.

i) Selection of Respondents: The selection of respondents is the key to interview schedule administration. The respondents are selected through various sampling methods and their names and addresses are noted down. The field investigator approaches them for data collection by filling up the interview schedule.

ii) Training of the Field Staff: Before sending field investigators for data collection, try to give them proper training on the interview schedule. If possible, some orientation on various aspects of the problem may be given. It will enable the field investigator to effectively interact with the respondents. Nowadays, the NFHS (National Family Health Survey), RCH (Reproductive and Child Health) surveys and many base line surveys conducted by various agencies spend a lot of money in training of the field investigator before sending them for data collection.

iii) Method of Conducting an Interview: The field investigator must be practiced in conducting interviews; otherwise, respondents sometimes may not allow them to take the interviews. He must approach the respondents politely, introduce himself/herself and tell them the purpose of interview and the confidentiality involved in it. The respondents must be approached by the field investigator according to their convenience. Getting correct information from the informants depends on the skill of the field investigator.

iv) Editing of the Interview Schedule: Editing of the interview schedule is a must before sending it for tabulation and analysis. While checking the schedule, one must notice the number of cases allotted, number of cases contacted, and number of cases lost due to refusal. The field supervisor must check the schedule filled up by the field investigator. If information is missing from any schedule then the field investigators could be sent again for data collection. If the schedules have codes for different alternative responses, these should also be checked, and, if any contradiction exist must be shared before sending it for final data entry and tabulation.

Sample Interview Schedule

Title: Socio-Economic Study of Households in an Urabn Slum

(To be filled by the Head of the Household Or Any Adult Member of the Family)

Name of the Respondent: ....

I) Identification of slum:

1) Name of the slum ....

II) Identification of Household: ....

1) Household Survey No ....
(marked by the survey team)

2) Name of the Head of the Household ....

3) Religion ....

4) Caste/Sub Caste, Specify ....

III) Housing Condition:

1) Type of House;

i) Kacha (…..)

ii) Pacca (…..)

iii) Semi Pacca (…..)

iv) Any other (…..)

2) Main source of drinking water;

i) Government/own hand pump (…..)

ii) Tap/pipe (…..)

iii) Canal/river (…..)

iv) River/well/pond (…..)

v) Any others, specify ....

3) Toilet facilities;

i) Flush (…..)

ii) Pit (…..)

iii) Open field (…..)

iv) Any other (…..)

4A) Main source of light;

i) Electricity (…..)

ii) Kerosene/Oil (…..)

iii) Gas (…..)

iv) Any other (…..)

4B) Main source of cooking;

i) Traditional *chulha* (…..)

ii) Bio-gas/gas (…..)

iii) Kerosene/electric stove (…..)

iv) Any other (…..)

5) Communication Media;

i) Radio/transistor/tape recorder (…..)

ii) Television (…..)

iii) Newspaper/magazine (…..)

iv) Any other (…..)

6) Agricultural land owned by the household in their village

i) 1-10 Bigha (…..)

ii) 11-20 Bigha (…..)

iii) 21-30 Bigha (…..)

iv) 31-40 Bigha (…..)

v) 41 Bigha and above (…..)

(Note : One hectare is equivalent to approximately 12 *Bigha*)

7) Average monthly income of household (Rs. per month);

i) Rs.1-1000 (…..)

ii) Rs.1001-2000 (…..)

iii) Rs.2001-3000 (…..)

iv) Rs.3001-4000 (…..)

v) Rs.4001-5000 (…..)

vi) Rs.5001 and above (…..)

(Kindly mention actual income of the household……………………)

IV) **Household Profile**

Sr. No.	Members of the house hold (start from Head of the house hold)	Relationship	Sex	Age	Marital Status	Education	Occupation	Diseases
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Note: 1) If there are more than 15 members in a household, use another household schedule to fill the relevant data of the household profile.

2) If age of any member, under (Col.5) is below 5 years then Col. 6, Col. 7 and Col. 8 are not to be filled.

Col. (3) Relationship:

(i) Head of household-01; (ii) Spouse (wife/husband)-02; (iii) Son-03; (iv) Daughter-04 (v) Grandson-05; (vi) Granddaughter-06; (vii) Father-07; (viii) Mother-08; (ix) Grandfather-09; (x) Grandmother-10; (xi) Son in law-11; (xii) Daughter in law-12; (xiii) Brother-13; (xiv) Sister-14; (xv) Brother in law-15; (xvi) Sister in law-16; (xvii) Uncle-17; (xviii) Auntie-18; (xix) Nephew-19; (xx) Niece-20; (xxi) Servant-21; (xxii) Other household member specify……………………-22. (It should be clear that persons sharing their meals in a single kitchen, are considered as family members)

Col. (6) Marital Status:

(i) Currently married-01; (ii) Separated-02; (iii) Widow-03; (iv) Widower-04; (v) Divorced-05; (vi) Never married-06

Col. (7) Education:

(i) Illiterate-01; (ii) Literate (non-formal)-02; (iii) Primary-03; (iv) Middle-04; (v) High School-05; (vi) Higher Secondary or Intermediate-06; (vii) Graduate-07; (viii) Post Graduate and above-08; (ix) Professional or Technical Education-09; (x) Any other, specify…………………..-10.

Col. (8) Occupation:

(i) Cultivator-01; (ii) Agricultural/casual labourer-02; (iii) Self-employed -03; (iv) Private service-04; (v) Government service-05; (vi) Household/domestic activities-06; (vii) Student-07; (viii) Unemployed-08; (ix) Any other, specify…………………..-10.

Col. (9) Diseases:

(i) Tuberculosis (T.B.)-01; (ii) Asthma-02; (iii) Cataract/Blindness-03; (iv) Laprosy-04; (v) Physical impairment-05; (vi) Malaria during last 3 months-06; (vii) Diabetes-07; (viii) Hypertension-08; (ix) Heart Problem-09; (x) Any other specify…………………..-10.

1.4.1 Advantages of Interview Schedule

i) the interview probes the problem in detail which gives scope to gather detailed information

ii) there is a personal touch between the investigator and the respondents and, therefore, detailed and exhaustive information can be collected

iii) there is greater accuracy in getting the information

iv) the interview method is particularly suitable for illiterate respondents.

1.4.2 Disadvantages of Interview

i) it is a time consuming and expensive method, compared to the questionnaire method

ii) lack of objectivity is a common lacuna of the interview method

iii) the interview method sometimes leaves investigators at the mercy of respondents.

Now that you have read about interview schedule, try and answer the following questions in *Check Your Progress 2.*

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What are the advantages of the interview schedule method?

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2) What steps need to be taken while preparing an interview schedule?

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1.5 SECONDARY DATA COLLECTION METHODS

Secondary data are collected by investigators from sources other than primary respondents. Secondary data are collected from both, published and unpublished sources. The main resources of secondary data are given below.

i) Official publications of the Central Government such as Census, NSSO Report, Human Development Report, SRS report, etc.

ii) Research and study reports of bilateral and multilateral organizations such as WHO, World Bank, IMF, UNESCO, UNICEF, etc. A few of them include, the World Development Report, World Development Indicators, Human Development Report, etc.

iii) Reports brought out by committees and commissions such as the Mandal Commission Report, the National Planning Commission Report, the Human Rights Commission Report, the Population Commission Report, etc.

iv) Policy documents of the Central and State Government such as National Population Policies, National Education Policies, National Health Policies, etc.

v) Publications brought out by the research institutes, universities and organizations.

vi) Publications of data sources on different national and international journals such as Economic and Political Weekly, Indian Economic Journal, etc.

vii) Books and articles published on various subjects.

viii) Official publications of the Reserve Bank of India, State Bank of India, Association of Indian Banking, etc.

ix) Information available in year books and encyclopaedias.

x) Statistical abstracts published both by the Central and State Governments.

xi) Information published in the directories and bulletins of various institutions such as the Indian Council of Social Sciences Research, the Indian Council of Agricultural Research, etc.

xii) Abstracts and index of reports and articles published by various research, teaching, and related organizations.

1.5.1 Precautions in the use of Secondary data

While using secondary data for the study, users have to be careful. Sometimes, the data published by an individual researcher may be full of errors and even drawn from an inadequate sample. Some factors to keep in mind while using the data from secondary sources are listed below.

Adequacy –sometimes data available from the secondary, sources are not adequate for the investigation. Data may either be from a different time period, or partially fulfil the requirement of the study. Therefore, adequacy of the data must be ensured before conducting the study.

Reliability – before using secondary data, its reliability must be taken into consideration. For example, the reliability on sample size and the sampling method used in the collection of data may be taken into consideration. Besides, the investigator has also to know the degree of bias in collection of data.

Suitability –the investigator has to check whether the data is suitable for the purpose of the research study. Sometimes, the secondary data may be suitable for tabular presentation, but, unsuitable for statistical analysis.

The investigator has to take all these factors into consideration before using the secondary data.

In this section you read about the secondary data methods. Now try and answer the questions in *Check Your Progress-3.*

Check Your Progress 3

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What are few sources of secondary data?

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2) What precautious have to be taken while using secondary data?

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1.6 LET US SUM UP

This unit describes in detail the various sources and methods of collection of quantitative data. It also deals with the methods of collection of primary data and secondary data. The advantages and disadvantages of various methods of data collection have also been envisaged in the unit. The unit also narrates the precautions one has to take care up while collecting the primary and secondary data.

1.7 REFERENCES AND SELECTED READINGS

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1.8 CHECK YOUR PROGRESS-POSSIBLE ANSWERS

Check Your Progress 1

1) What do you mean by primary data?

   Primary data are those data which are originally collected by the investigators, while the secondary data are used by investigator collected through some other sources. For example, information collected by an investigator from a student regarding his class, caste, family background, etc., is called primary data. On the other hand, if the same information is collected about the student from the school record and register, then it is called secondary data.

2) What are advantages of a questionnaire?

   The advantages of a questionnaire are

   a) it is less expensive compared to interview schedule and can be administered over a large number of sample

   b) it is less time consuming.

   c) the interviewer is not present during the administration of questionnaire, the respondents have greater freedom and confidence in answering questions

   d) one of the adventures of the questionnaire is that once it is standardized, then there is greater uniformity in getting responses.

Check Your Progress 2

1) What are the advantages of the interview schedule?

   The advantages of the interview method are as follows:

   a) the interview probes the problem in detail which gives scope to gathering detailed information

   b) there is a personal touch between the investigator and the respondents, and, therefore, detailed and exhaustive information can be collected

   c) there is greater accuracy in getting the information

   d) the interview method is particularly suitable for illiterate respondents.

2) What precautious have to be taken care of while preparing an interview schedule?

   The precautions that have to be taken care of during the preparation of the interview schedule are**:**

   - Selection of Respondents: this is the key to interview schedule administration.
   - Training of the Field Staff: before sending the field investigator for data collection, try to give them proper training on the interview schedule.
   - Method of Conducting an Interview: the field investigator must be apt in conducting the interview, otherwise respondents sometimes may not allow them to take interview
   - Editing of the Interview Schedule: the investigator has to do proper editing of the interview schedule before sending it for tabulation and analysis.

Check Your Progress 3

1) What are a few sources of secondary data?

   1) Official publication of the Central Government such as Census, NSSO Report, Human Development Report, SRS report, etc.

   2) Research and Study Reports of bilateral and multilateral organizations such as WHO, World Bank, IMF, UNESCO, UNICEF, etc. A few of them like World Development Report, World Development Indicators, Human Development Report, etc.

3) Reports brought out by Committees and Commissions such as Mandal Commission Report, National Planning Commission Report, Human Rights Commission Report, Population Commission Report etc.

2) What precautious have to be taken care of while using secondary data?

Some of the factors to be kept in mind while using the data from secondary sources are:

Adequacy –sometimes data that is available from secondary sources are not adequate for the research project. Data may either be from a different time period or partially fulfil the requirement of the study.

Reliability – before using the secondary data, its reliability must be taken into consideration. The investigator has also to know the degree of bias in the collection of data.

Suitability –the investigator has to see whether the data is suitable to his or her study. Sometimes, the secondary data available may be suitable for tabular presentation, but unsuitable for statistical analysis.