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INTRODUCTION TO INVESTIGATION AND STATISTICAL UNITS

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ABSTRACT

It is vital when planning statistical investigations that understand the importance of the way that they plan, collect, record and present their information. If they are not consistent in the way they carry out any of these steps, they could alter their findings, therefore making their investigation invalid.

In this unit will first look at choosing questions to investigate, making sure that the topic lends itself to being investigated statistically. They will then collect their data using tally charts. Once they have collected and recorded their data they will present their findings as bar graphs.

KEYWORDS :*Statistical Investigation, Type of Investigation, Statistical Units.*

INTRODUCTION :

a) Object and scope of Statistical Investigation -

Before starting a statistical investigation the first and foremost task is to know the nature, object and scope of the investigation. It is to be deeded whether the enquiry in view is to serve a general purpose or a specific one. The correct determination of the purpose helps in removing a number of complexities and difficulties. So it should be done with minimum wastage of time, money and energy. In deciding the object and scope of investigation we should not (i) over estimate out aims and (ii) be unmindful of the money and time available to us.

The scope of statistical investigation depends upon the object of investigation, which, in turn, will determine the area of coverage of enquiry.

b) Formation of Statistical Units -

A statistical unit is the unit of measurement in terms of which be magnitude of a variable is expressed. Quantitative data can be collected accurately only when the unit in which it is to be counted, measured, or estimated, has been correctly defined. According to Prof King "It is not only desirable but strictly essential that the units be accurately and unambiguously defind. Definition of unit is neces¬sary to avoid any misunderstanding and to bring homogeneity in data. The need for defining unit is all the more felt because of the quantitative nature of the unit and lack of standard connotations". The ideal statistical unit should possess the following main characteristics.

1) It should be suitable to the specific purpose of investigation
2) It should be unambiguous and specific
3) It should be complete in itself
4) It should be homogenous and not heterogeneous
5) It should be easily understandable as well as easy to use.

Types of statistical units: Statistical units may broadly be clas¬sified into two main groups as in Fig 1.1.

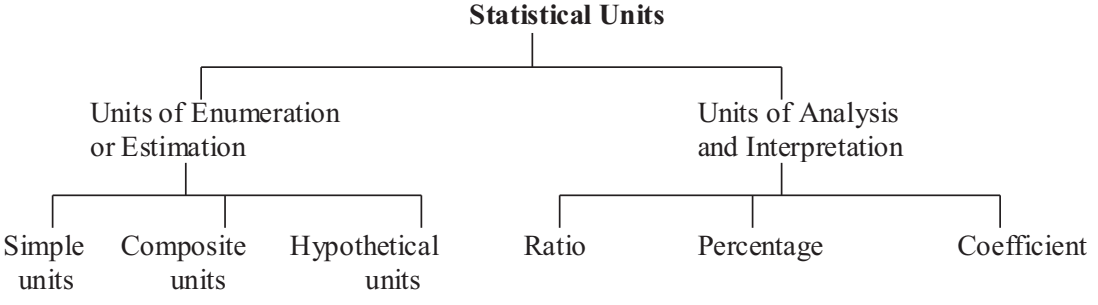

Fig 1.1 Statistical units

Units of Enumeration or Estimation :

Units of enumeration or estimation are those units which are concerned with measurement and consequently with collection of data, e.g., agricultural production may be estimated in MTS and the consumption of electricity in KWS. These units can be divided into three main groups: Simple Composite and Hypothetical units.

i)Simple units are those units which are not difficult to define e.g. tonne, lb, metre, etc.

ii)Composite units are those units in which we add one qualifying word to the simple unit e.g., kilometer is a simple unit but when it is multiplied with tonnage it becomes kilometre - tonnage which is a composite unit. Other similar units are passenger - Km, labour - hours, bus - Km, etc.

iii)Hypothetical units are those units which are expressed in a hypothetical measurement. For eg. the power of an engine is defined in horse - power.

Units of Analysis :

These are the units in which we express statistical data; they are generally in terms of ratios, percentages, coefficients etc.

C) Type of Investigation –

There are various types of investigations which are used in different situations. Each type of

investigation has got its own merits and demerits. Hence, the right type of investigation must be chosen with reference to its objectives. Following are some of the types of investigation.

1) Census and sample investigation : In census investigation every unit is important; but in a sample survey decisions are based on the choice of the set of units. The former would be costly and time - consuming. The latter would be less costly and less time - consum¬ing. But it is less accurate and subject to bias error. The ultimate choice between the two will, however, depend upon the objectives sought.

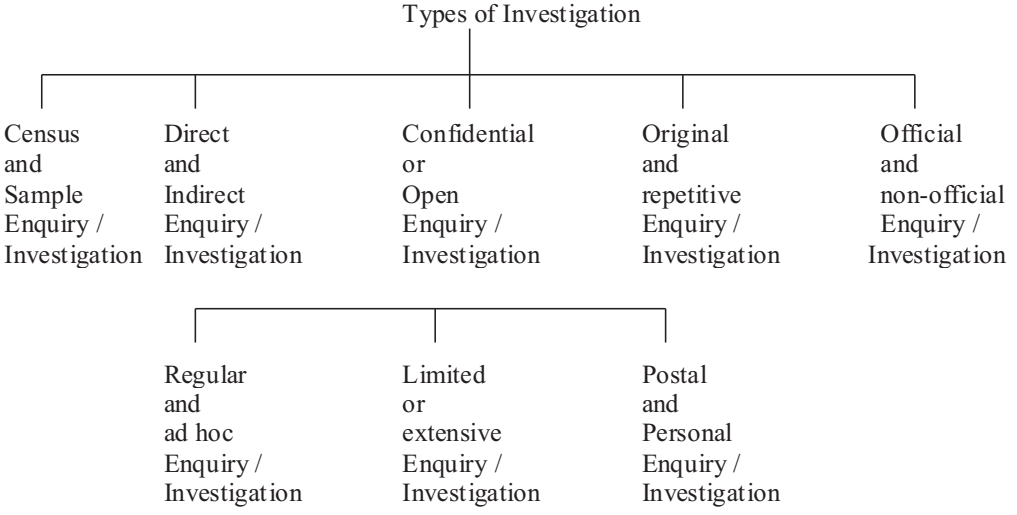

Fig. 2.2 : Types of investigation

2) Direct and Indirect Investigation:- Direct investigation is pos¬sible where the attributes are directly measurable; e.g., the production of steel can be measured in terms of tonnes and the height of persons is measurable in inches and centimetres. Indirect investigation is possible in those situations where the factors are not subject to qualitative measurement but are subject to quantitative measurement e.g., health, intelligence, honesty, etc.

3) Confidential and Open Investigation:- An investigation whose results are neither published nor open to the public is known as confidential investigation. On the contrary, an investigation whose results are published and the data are available to common masses is known as open investigation. The type of enquiry to be used will, however, depend upon the nature of the problem in hand.

4) Original and Repetitive Investigation:- An investigation conducted for the first time is known as original investigation. A repetitive investigation is based on the enquiries conducted at an earlier time and being repeated again.

5) Regular and adhoc Enquiry / Investigation:- There are certain research organizations which conduct enquiries for regular purpose; e.g., the Government of India conducts various enquiries regularly like those relating to unemployment, industrial production, agricul¬tural production and fish production, etc. These enquiries are regular and are conducted after a fixed interval; but there are certain inves¬tigations which are conducted on adhoc basis; e.g., we may hold on adhoc enquiry to determine the effect of natural calamity on agricul¬tural production, cyclone - affected area investigation; etc.

6) Official and Non-official enquiry/Investigation:- This classifica¬tion refers to the organisation that conducts an enquiry. If the Government or its agencies are conducting an investigation, it is known as an official enquiry, whereas if a non - Government agency conducts an enquiry it is known as non official enquiry. In other words, an enquiry conducted by the State Government or Central Government and its

agencies, it is known as an official enquiry and an enquiry conducted by a private agency it is known as a non-official enquiry.

7) Limited and Extensive enquiry / Investigation:- An enquiry which is conducted by employing only a limited number of persons is known as a limited enquiry. On the other hand, an extensive enquiry involves a large number of people.

8) Postal and Personal Enquiry / Investigation:- If the area of investigation is very large, the method of enquiries by post is adopted. Questionnaires are sent for gathering the requisite information. The method of postal enquiry is economical but less reliable. The results may also get biased if an adequate number of replies are not received. On the other hand if the enquiries conducted in person is known as personal enquiries. The information so collected is more reliable but comparatively costlier. The type of investigation to be employed will depend upon various factors, viz., the nature of investigation, the availability of time and funds, etc.

DEGREE OF ACCURACY –

Before conducting an enquiry on scientific basis, it is essential that the degree of accuracy desired must be predetermined. Absolute accuracy is neither possible nor desirable because: a) Statistics is based on estimates, b) Tools of measurements are not always perfect, c) Unintentional errors of observation and measurement by the investigator also persist. Prof, king had once remarked that "Any attempt to obtain greatest degree of accuracy is frequently mere waste of time". Therefore, a reasonable degree of accuracy is determined with reference to the cost involved and the purpose of investigation. It is highly essential to quote the standard of probable error.

CONCLUSION

In the primary school classroom, the Statistics and Probability strand can sometimes be trivialized into a few semi-engaging opportunities to collect a bit of data, much of which is of no real interest to students nor serves to show the capacity of mathematics to make sense and order out of students' lives. Rather, this strand should be an opportunity to involve students in rich investigative tasks that relate to real life, other learning areas and important social issues.

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