

DATA PRESENTATION & TABULATION

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Abstract:

Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write." *H.G. Wells*. This article is meant to explain the relevance of data presentation and interpretation in research. The broad objectives include, different ways to summarize data, The selection of right table/graph for the right data, Interpret data to consider the programmatic relevance, Ability to do simple statistical calculations with a calculator, Carry out data analysis using a statistical package such as SPSS, Select the right procedure for analysing a set of data, Interpret results correctly and report findings, Understand statistical contents of papers in medical journals, discuss and communicate ideas in a quantitative manner

Statistics Means

- "A branch of mathematics dealing with the analysis and interpretation of masses of numerical data" -*Merriam-Webster Dictionary*
- "The field of study that involves the collection and analysis of numerical facts or data of any kind" -*Oxford Dictionary*

BIOSTATISTICS: Application of statistical methods to biological, medicine and health sciences

NEED FOR STATISTICS IN BIO MEDICINE.

- biomedical research projects mostly carried out on small numbers of study subjects
- challenging problem to project results from small samples studies to individuals at large
- attributes differ not only among individuals but also within the same individual over time

HOW TO SUMMARIZE DATA?

The two main ways of summarizing data are by using tables and charts or graphs. A table is the simplest way of summarizing a set of observations. A table has rows and columns containing data, which can be in the form of absolute numbers or percentages, or both.

Charts and graphs are visual representations of numerical data and, if well designed, will convey the general patterns of the data.

To make your graphics as self-explanatory as possible, there are several things to always include:

- Every table or graph should have a title or heading

- The x- and y-axes of a graph should be labeled – include value labels, such as a percentage sign; include a legend
- Always cite the source of your data and put the date of data were collection or publication
- Provide the sample size or the number of people to which the graph is referring (N)
- Include a footnote if the graphic isn't self-explanatory

Collection of data is the first step in any study. Usually the data collected are voluminous and scattered and may contain many unwanted, unnecessary and minute details. So obtaining value information from this raw data will be difficult. This can be solved by grouping this valued information into characteristics of interest, and this is called 'Classification'.

After classification, the data has to be presented in a convenient form. The process of arranging the data in tabular form is called "Tabulation".

So tabulation is the process of summarizing raw data and displaying the same in compact form. That means, tabulation is an orderly arrangement of data in columns and rows

USES OF TABULATION:

- It facilitates the process of comparison.
- Statistical tables save space by reducing exploratory and descriptive statements to a minimum.
- Makes it easier to remember the data.
- Facilitates the summarizing of items and the detection of errors and omissions.
- Finally it provides a basis for statistical computations.

PRINCIPLES OF TABULATION:

- Tables should be numbered as Table 1, Table 2 etc.
- Title of the table – must be brief and self-explanatory.
- Headings of columns or rows should be clear and concise.
- Data must be presented according to the size or importance.
- Source from where data are taken must be indicated below the table.
- Columns may be numbered to facilitate reference.
- Columns whose data are to be compared should be kept side by side. Percentages must also be kept close to the data.
- Explanatory footnotes regarding any concerning table should be placed beneath the table.
- Columns are separated one another by lines
- Thick lines are used to separate data from one another. Thin lines used for subdivisions.
- Total can be placed at the bottom or top of the column.
- Heading of the column are of two types. That appear at the top of column are called "Caption" and appearing on the line are called "Staff".
- Rows in a table should not be too large or too small.
- Class intervals should be the same throughout the table, except in case of age.

- Abbreviations should be avoided to the extent possible and ditto marks should not be used in the table.
- Reasons for omitting or excluding any data should be given.
- Arrangement of table's in-group should be according to magnitude or alphabetical or chronological order to facilitate comparison.

Classification and tabulation of data are comparatively easy, in the case of Qualitative data because it can be numbered easily. In case of Quantitative data, especially if it is in continuous scale, it can take innumerable values including decimals within intervals. So for the classification and tabulation of such data, a systemic approach is necessary. This is being attained through the construction of "Frequency Distribution Tables".

To construct a frequency distribution table the range of values assumed by a variable along with the range of values assumed by a variable along with the respective frequencies of occurrence of each variables, is respected in tabular form.

If the number of values is more, a classification by taking every item consideration is not possible. In such cases, the range of variable is divided into sub ranges called "Class Intervals".

The upper and lower values of the classes are called "Class Limits" and if the class limits are in continuous scale, the values are called "Class Boundaries or True Class Limits". The difference between the class limits is called the "Width of class". The mid-value of the class is obtained by taking the average of the lower and upper class limits.

The frequency tables must be numbered serially. A vertical arrangement is preferred. An ideal table can have 5 to 10 classes but should not be more than 20. There must be proper and self-explanatory headings. The column and row headings must reflect the real nature of the piece of information tabulated. If only one piece of information is tabulated, it is called a "Simple Table". In case, two characteristics – one column-wise and the other row-wise- are presented, such tables are called "Cross Tables or Dichotomous Tables".

CONSTRUCTION OF FREQUENCY DISTRIBUTION TABLES:

To construct a frequency table manually, the first step is to construct a preliminary table in a standard format with three columns viz. class limits, tally marks and frequency. Then the range of value assumed by the variable is divided into subgroups and each observation is accounted by tally marks as sets of five to four tally marks along one side and the 5th across. Then the number to tally marks are counted and entered in the frequency column.

PRELIMINARY TABLE FOR THE CONSTRUCTION OF A FREQUENCY TABLE

CLASS LIMITS	TALLY MARKS	FREQUENCY
40- 45	///	4
45- 50	/	12
50- 55	/ / / /	16
55- 60	/ /	12
60- 65		6
TOTAL		50

ARTICLE

For example; in each college during the admission day some basic information from the student will be collected, such mentioned in the table.

BASE LINE INFORMATION OF STUDENTS ADMITTED FOR 12th STD.

NAME OF THE STUDENT:

AGE (In years):

PLACE OF RESIDENCE:

RURAL:

URBAN:

SEX:

FEMALE:

MALE:

STUDY PERFORMANCE IN THE PAST:

POOR:

AVERAGE: GOOD:

HEIGHT(cm):

WEIGHT(kg):

Hb gm %:

Here the class limits are taken in a continuous scale. Then, it is customary to include the observation, holding the upper limit as its value in the succeeding class, except in the case of the last class.

According to the given data the weight distribution of student will be like the below table.

DISTRIBUTION OF STUDENTS ACCORDING TO WEIGHT(in kg):

Weight (kg)	No. of students	%
40- 45	4	8
45- 50	12	24
50- 55	16	32
55- 60	12	24
60- 65	6	12
Total	50	100

DISTRIBUTION OF STUDENTS ACCORDING TO PLACE OF RESIDENCE:

Place Of Residence	No.	%
Rural	40	80
Urban	10	20
Total	50	100

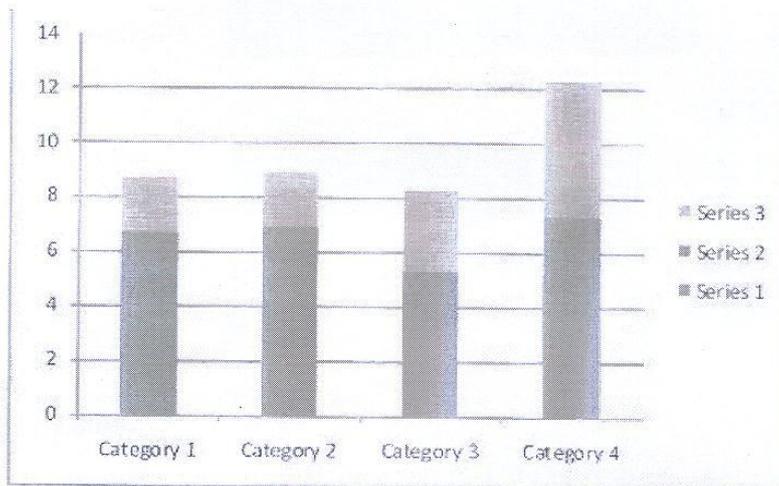
DISTRIBUTION OF STUDENTS ACCORDING TO PLACE OF RESIDENCE AND SEX:

Place Of Residence	Male	Female	Total
Rural	10	30	40
Urban	5	5	10
Total	15	35	50

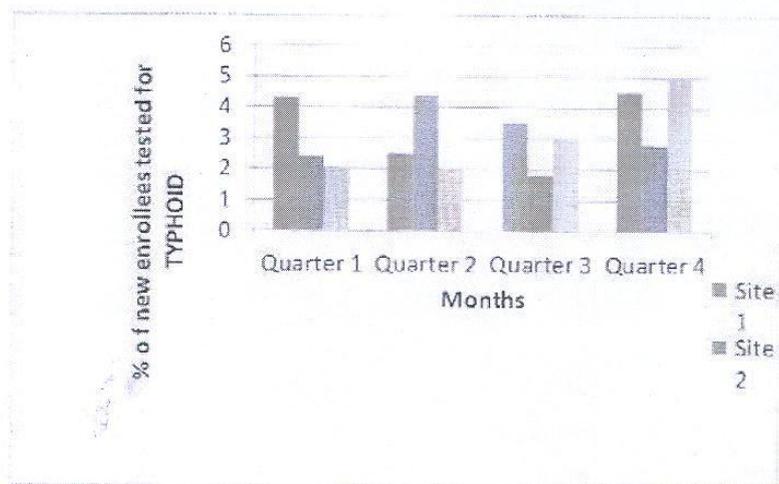
ARTICLE

Diagrams and charts are supplementary aids to tables. Diagram indicating the comparative scoring of a cricket match on television or hearing an inspiring song with dramatic clippings of the relevant scenes. A visual impact can avoid distraction of attention. Also, many people are not very much comfortable with numbers and try to avoid numerical presentations as far as possible. So statistical data are presented diagrammatically as supplementary aids to tables to give stress to the important findings. It must be prepared by considering the need, suitability and capability of the reader. As in the case of tables, the diagrams are also to be numbered. It must have a self-explanatory heading. Depending upon the need and significance, the qualitative data can be tabulated and presented in different ways. Bar diagram mainly preferred in scientific presentation. Pie diagram better choice for comparing the component parts. Also in case the data spread over along period and the trend of the events all to be observed, the line diagram may be choice of preference.

BAR CHART (Comparing categories)



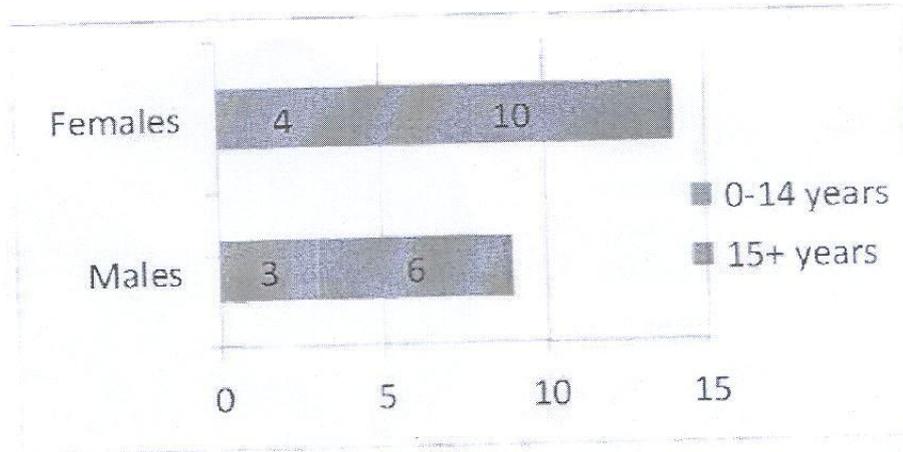
Percentage of new enrollees tested for TYPHOID at each site, by quarter



STACKED BAR CHART

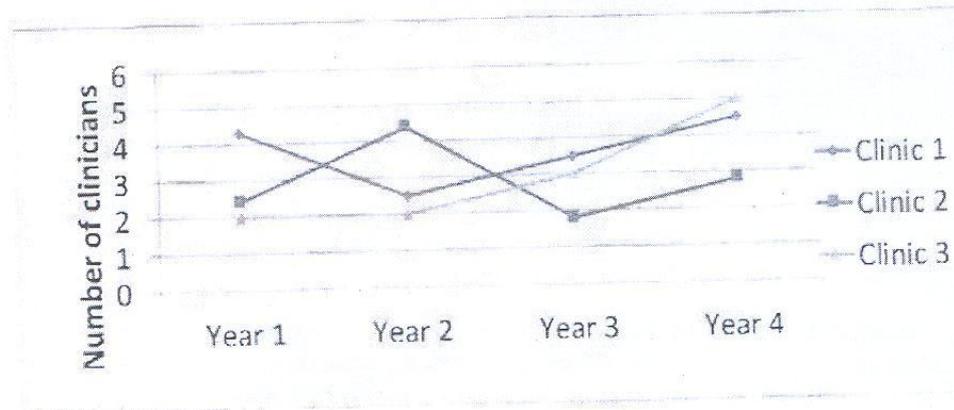
Represent components of whole & compare wholes

Number of Months Female and Male Patients Have Been Enrolled in TYPHOID, by Age Group



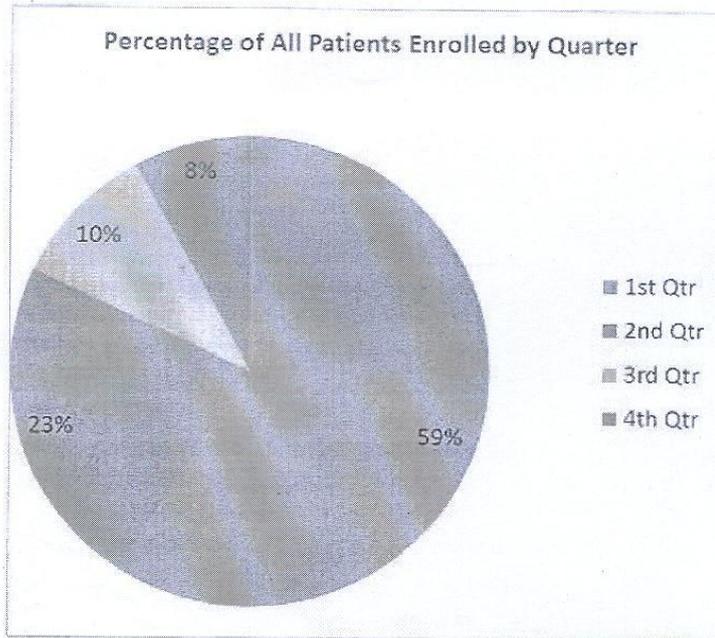
LINE GRAPH

Number of Clinicians Working in Each Clinic During Years 1-4



PIE CHART

Contribution to the total = 100%



Reference:

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