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# Presentation of Data

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Presentation of data is a fundamental aspect of statistics that involves organizing and displaying data in a clear and concise manner to facilitate understanding and analysis.

## Objectives of Tabulation

- To clarify the object of investigation.
- To clarify the characteristics of data.
- To present the data in the minimum space.
- To facilitate statistical processes.
- To find out errors in the collection of data.

## Advantages of Tabulation

- Simplifies facts for easy comprehension.
- Economical use of space.
- Attractive presentation of data.
- Other benefits such as ease of comparison and analysis.

## Main Parts of a Table

- Table number
- Heading or title
- Captions
- Stubs
- Main body of the table
- Ruling and spacing
- Foot-notes
- Arrangement or adjustment of items
- Source of data
- Averages and totals
- Unit of measurement

## Types of Tables

### (a) On the basis of purpose:

- General purpose
- Special purpose

### (b) On the basis of originality:

- Original table
- Derived table

### (c) On the basis of construction:

- Simple table
- Complex table:
  - Two-way table
  - Manifold fold table

## General Rules for Tabulation

- Proper demonstration of main points of the body according to the objective.
- Manageable size and clarity.
- Approximation and unit consistency.
- Adherence to other tabulation laws.

## Essentials of a Good Table

- **Attractive:** Contains all relevant details and is visually appealing.
- **Clarity:** Clear and easy to read with logically organized information.

- **Simplicity:** Not too complex, easy to understand.
- **Accuracy:** Based on valid data and reliable sources.
- **Consistency & Scientifically Prepared:** Uniform formatting and design.
- **Completeness:** Includes all relevant information needed by the reader.
- **Relevance:** Supports the purpose of the document and topic.

## Diagrammatic Presentation of Data: Bar Diagrams and Pie Diagrams

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Diagrammatic presentation is a visual method of presenting data to highlight its salient features effectively.

### Advantages of Diagrams

- Attractive and impressive visual appeal.
- Make data simple and understandable.
- Facilitate comparative study.
- Save time and money.
- Universal utility across fields.
- Helpful in forecasting trends.

### Limitations of Diagrammatic Presentation

- Quantitative precision is not possible.
- Small differences in values are hard to represent.
- Cannot represent manifold information simultaneously.
- Prone to misuse or misinterpretation.
- Diagrams are means to an end, not the end themselves.
- Require precautions and experience to construct accurately.
- Limited accuracy.
- Useful mainly for comparative studies.
- Not suitable for future analysis.

### General Rules for Constructing Diagrams

- Attractiveness
- Accuracy
- Appropriate size
- Clear heading
- Proper scale
- Neat drawing
- Index or legend
- Correct method selection
- Effective presentation
- Economy in design

## Bar Diagram

Bar diagrams present data using bars or rectangles, where the length or height of the bar is proportional to the value of the data.

### Types of Bar Diagrams

- **Simple Bar Diagram:** Based on a single set of numerical data.
- **Double or Multiple Bar Diagram:** Used to present two or more attributes related to time or space.
- **Sub-Divided Bar Diagram:** Bars divided into parts proportional to data values; the whole bar represents the total.
- **Percentage Sub-Divided Bar Diagram:** Shows parts of data as percentages of the total bar length, which represents 100%.

## Pie Diagram

A pie diagram is a circle divided into segments representing percentage values of a data series. It shows relative proportions but not absolute values.

## Frequency Diagrams: Histogram, Polygon and Ogive

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**Graphs of Frequency Distribution** are graphical presentations of frequency data to visualize distribution patterns.

## Frequency Histogram

A histogram is a graphical representation of a frequency distribution for continuous data with equal class intervals. If intervals are unequal, adjustments are necessary.

## Frequency Polygon

A frequency polygon is formed by connecting the midpoints of the tops of the histogram bars with straight lines, showing the shape of the distribution.

## Frequency Curve

A frequency curve is a smooth curve drawn by joining the points of a frequency polygon freehand, representing the distribution continuously.

## Ogive

An ogive is a cumulative frequency curve plotted to show the cumulative frequencies against class boundaries. There are two types: less than ogive and more than ogive.

## Arithmetic Line Graphs: Time Series Graphs

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**Line Graphs or Time Series** represent statistical data changing over time. When plotted on graph paper, they are called time series graphs or algebraic line graphs.

## Merits of Graphic Presentation

- Attractive, interesting, and impressive.
- No advanced mathematical knowledge required.
- Simplest method of presenting data.
- Facilitates easy comparison.
- Allows determination of certain statistical measures.
- No special training needed.

## General Rules for Constructing a Graph

- Clear and descriptive title.
- Proper structural framework.
- Proportionate axes.
- Appropriate choice of scale.
- Use of false baseline if necessary.
- Use of linear or logarithmic scale.
- Include data table along with the graph.
- Correct impression and clarity.
- Index or legend.
- Source of data.

## Limitations

- Accuracy cannot always be verified.
- May be illogical or misleading if not constructed properly.
- Cannot present detailed information adequately.

## One Variable Graphs

Graphs showing the value of a single variable over time.

## Two or More Variable Graphs

Graphs showing two or more dependent variables plotted against time.

## False Base Line

The vertical axis should start from zero; however, sometimes the scale between zero and the smallest value is omitted to enhance clarity. This omitted portion is called the false base line.

## Key Words

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- **Statistical Data:** Data used to reach sound conclusions by providing information.
- **Primary Data:** Data collected for the first time; original in character.
- **Secondary Data:** Data previously collected by others, available in journals, periodicals, official records, etc.
- **Universe:** The entire group or population under study, also called census.
- **Sample:** A representative subset of the universe selected for detailed study.
- **Classification:** Process of arranging data into groups based on common characteristics.
- **Variable:** A characteristic that varies among individuals, items, places, or time.
- **Raw Data:** Unorganized, original data collected.
- **Statistical Series:** Data arranged in classes according to a given order.
- **Tabulation:** Systematic presentation of data in rows and columns.