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Statistical Studies

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Introduction

- Statistical studies

Statistical studies are conducted in many different ways.

Subjects of a study are the people ,animals (or other living things)

If the subject s are people , they may be called the participants in the study.

Two basic Types of Statistical Study

- Observational study

researchers observe or measure characteristics of the subjects but do not attempt to influence or modify these characteristics.

- Experiment study

researchers apply some treatment and observe its effects on the subjects of the experiment.

Example

- What type of the study do you think?
- 1. The polio vaccine study is
- 2. A poll in which college students are asked if they commute or live on campus is.....

Variable of interest

- *The variable of interest* in a statistical study are the items or quantities that the study seeks to measure.
- Explanatory variable is a variable that may explain or cause the effect.
- Response variable is a variable that responds to change in explanatory variable.



Data types

- **Quantitative data** consist of values representing counts or measurement.
- **Qualitative data** consist of values that can be placed into non numerical categories.
- **Continuous data** can take on any value in a given interval
- **Discrete data** can take on only particular ,distinct values and not other values in between



Use of percentages in Statistics

- The absolute change is the actual increase or decrease from a reference value to a new value:

$$\text{Absolute change} = \text{New value} - \text{reference value}$$

- The relative change is the size of absolute change in comparison to the reference value

$$\text{Relative change} = (\text{absolute change}/\text{reference value}) \times 100$$

Use of percentages in Statistics

- The absolute difference is the difference between the compared value and the reference value actual
$$\text{Absolute difference} = \text{Compared value} - \text{reference value}$$
- The relative change describe the size of absolute difference in comparison to the reference value
- Relative difference = (absolute difference/reference value)x100



Example

Estimate world population in 1950 was 2.6 billion . By the end of 2017 , it had reached 6.9 billion describe the absolute and relative change in world population from 1950-2017



Example

Life expectancy for American men is about 76 years ,while life expectancy for Russian men is about 63 years , Using the life expectancy of Russian men as the reference value ,compare the life expectancy of American men with that of Russian men in absolute and relative terms

Index Numbers

Index numbers is a simple way to compare measurement made at different times or different places.

$$\text{Index number} = (\text{Value}/\text{reference value}) \times 100$$

Example

Suppose the cost of gasoline today is \$3.60 per gallon. Using the 1980 price (\$1.22) as the reference . Find the price index number for gasoline today.