

Statistics is a collection of scientific methods for **collecting, displaying, analyzing,** and **drawing** conclusions from data.

Biostatistics is the study of statistics as applied to biological areas. Biological laboratory experiments, medical research (including clinical research), and health services research all use statistical methods.

Statistics is a tool applicable in **scientific research**.

Research is commonly known as search for knowledge. It can be defined as search for systematic knowledge. Research is scientific and systematic investigation in relation to specific aspect. It is a movement from unknown to known.

• Two types of statistical methods are used **in analyzing data**:

1- **descriptive statistics** الإحصاء الوصفي أو التصويري

2- **inferential statistics.** الإحصاء الاستنتاجي

• **Descriptive statistics** are used to organizing and summarizing data using numbers and graphs

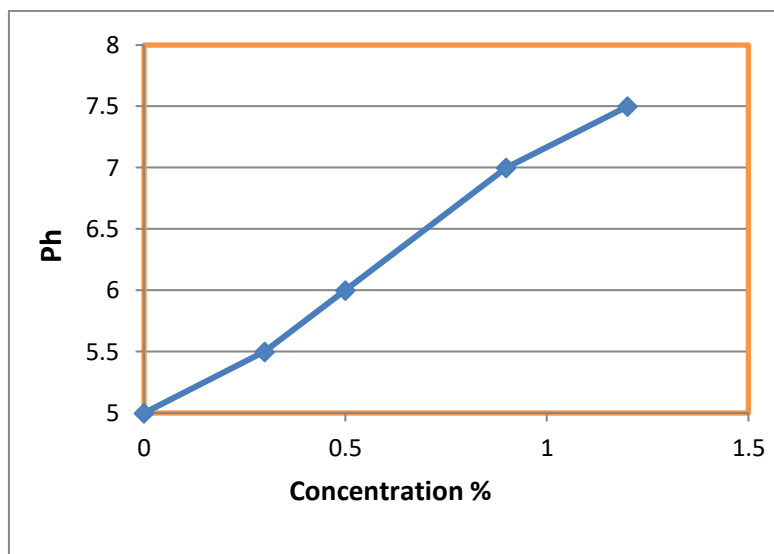


Fig. 1: Descriptive statistics

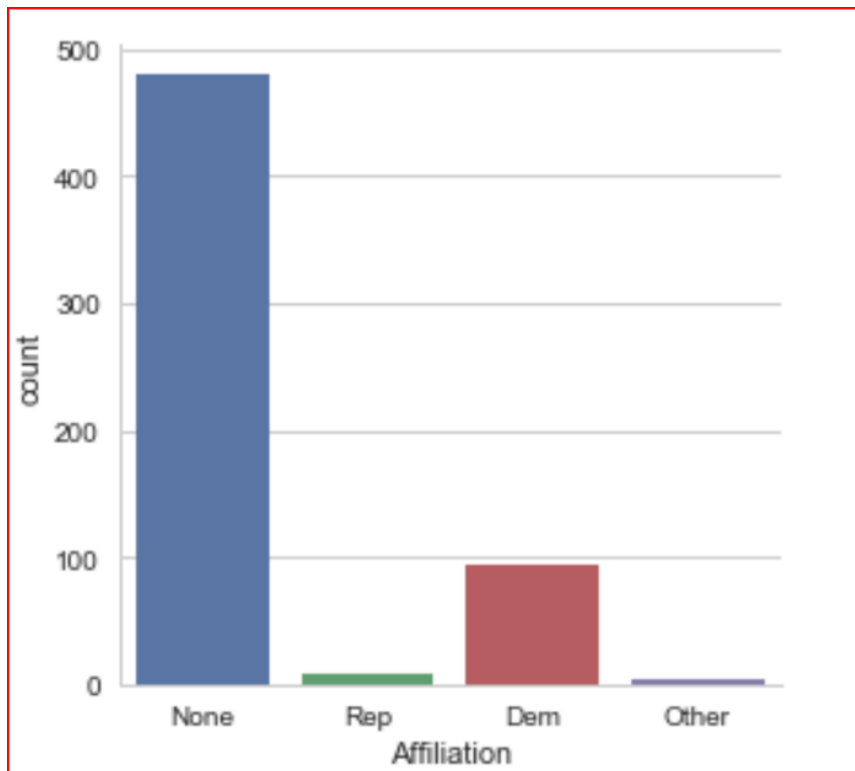
descriptive statistics you are simply describing what the data shows, **for example figure 1 shows that Ph increase as the concentration increase.**

- **Inferential statistics** used to make inferences using a sample data taken from a population or draw a conclusion of the population.

Inferential statistics takes data from a random sample and makes conclusion about the larger population.

Example// As an example, if we want to find out whether Obama was a better president or if people think Trump is better.

we cannot survey the entire country so we take a random survey from different part of USA and then try to draw **inferences for the population.**



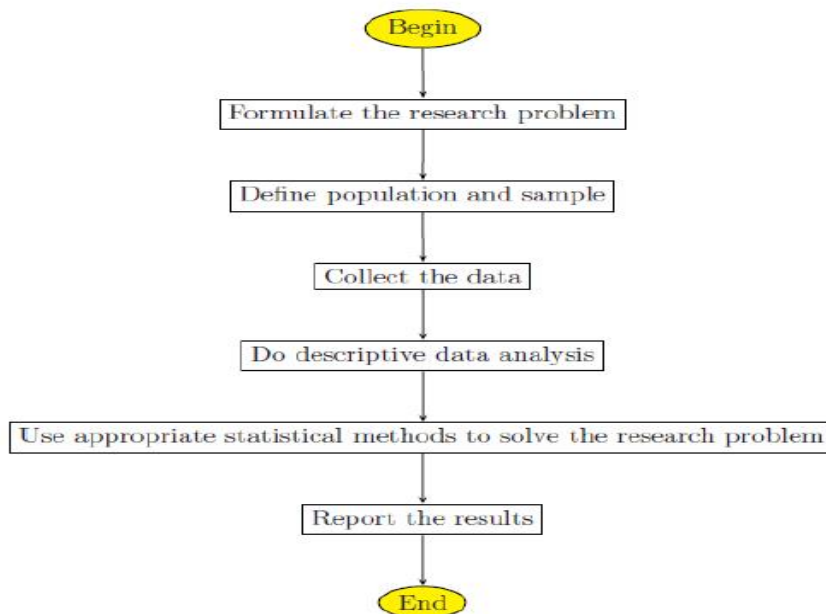
The stages in research process are listed as

- 1- Selecting research problems and stating of hypothesis.
- 2- Formulating of research design
- 3- Collecting, analyzing and interpreting of data.

These steps can summarized as under

1. Formulation of research problem
2. Review of the existing literature
3. Formation and development of working hypothesis
4. Preparation of research design
5. Determining sample design
6. Data collection
7. Project execution
8. Data analysis
9. Testing of hypothesis
10. Data interpretation
11. Report of the research work.

The goal of statistics is to gain understanding from data. Any data analysis should contain following steps:



Sources of Data

Any statistical data can be classified under two categories depending upon the **sources utilized**. These categories are,

1. Primary data
2. Secondary data

1- Primary data:

Primary data are information collected by a researcher specifically for a research assignment. Such data is original is generated by survey conducted by individuals .

The primary data can be collected by the following four methods:

1. Direct personal interviews.
2. Indirect Oral interviews.
3. Information from correspondents.
4. Questionnaire method.

2- Secondary Data:

Secondary data are those data which have been already collected for some other purpose and at different time in the past.