1 Introduction

Why study statistics?

- Make a glance at a news paper. You may observe news that deal with:
  - crime rates
  - birth rates
  - death rates
  - average income
  - average rainfall etc.

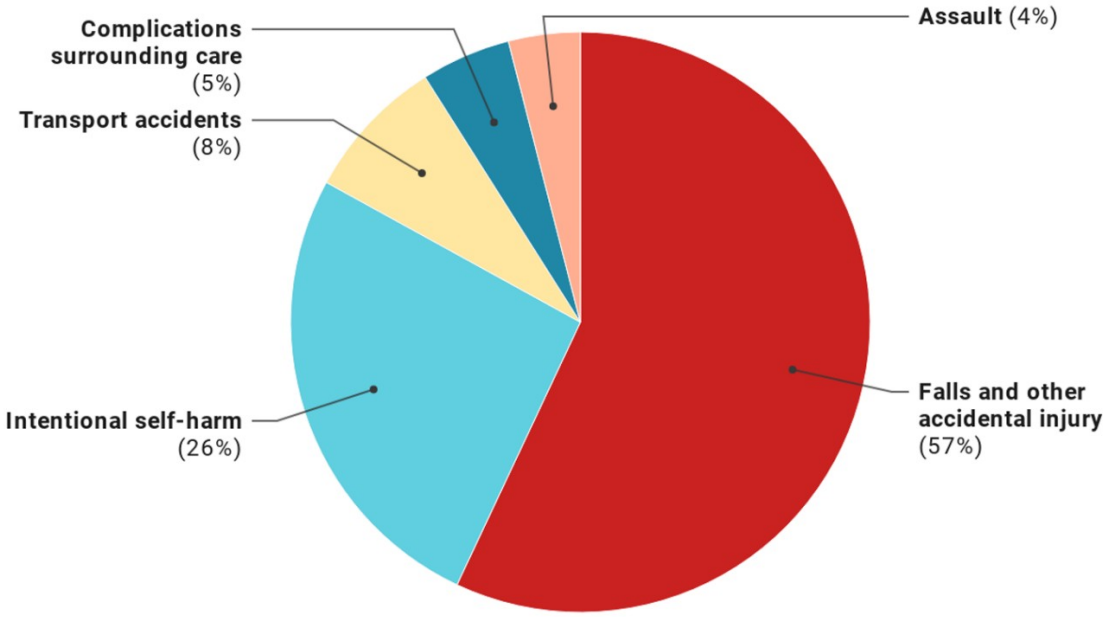
By a common definition, statistics consist of facts and figures.

- ኢትዮ ቴሌኮም በስድስት ወራት ውስጥ **22.04** ቢሊዮን ብር ገቢ አገኘ
- 15 January 2020
- ኢትዮ ቴሌኮም በበጀት ዓመቱ የመጀመርያ ስድስት ወራት (ከሐምሌ **2011** ዓ.ም. እስከ ታኅሳስ **2012** ዓ.ም .) **22. 04** ቢሊዮን ብር አጠቃላይ ገቢ እንዳገኘ አስታወቀ። ኩባንያው በ**126** ዓመት ታሪኩ ለመጀመርያ ጊዜ የዕቅዱን **104** በመቶ ማሳካት መቻሉን፣ እንዲሁም ገቢው ካለፈው በጀት ዓመት ተመሳሳይ ወቅት ጋር ሲነፃፀር የ**32** በመቶ ዕድገት ማሳየቱ ተገልጿል። የውጭ ምንዛሪ ከሚያስገኙ አገልግሎቶች **73** ሚሊዮን ዶላር የተገኘ መሆኑን፣ በዚህም የዕቅዱን **111** በመቶ ማሳካት መቻሉ ተጠቁሟል።

- ካለፈው ዓመት ተመሳሳይ ወቅት ጋር ሲነፃፀር የ116 በመቶ ዕድገት አሳይቷል። የኢትዮ ቴሌኮም ዋና ሥራ አስፈጻሚ ወ/ት ፍሬሕይወት ታምሩ ረቡዕ ጥር 6 ቀን 2012 ዓ.ም. በጽሕፈት ቤታቸው በሰጡት ጋዜጣዊ መግለጫ፣ ኩባንያው በስድስት ወራት ውስጥ 3.89 ቢሊዮን ብር ታክስ፣ ሁለት ቢሊዮን ብር ዲቪደንድ ለመንግሥት እንደከፈለ ተናግረዋል። በቬንደር ፋይናንሲንግ ሞዳሊቲ ለተከናወኑ ፕሮጀክቶች ብድር 148.15 ሚሊዮን ዶላር (4.4 ቢሊዮን ብር) እንደተከፈለ ወ/ት ፍሬሕይወት አስረድተዋል። የኩባንያው የደንበኞች ብዛት 45.6 ሚሊዮን መድረሱና አጠቃላይ የቴሌኮም ስርፀት 45.4 በመቶ እንደ ደረሰ ተገልጿል።

Cause of non-natural death

Analysis of 93,955 death registrations recorded by the (ONS) across England and Wales between January 1 2011 and December 31 2015.



Source: ONS

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The increasing availability of computers and statistical software packages has enlarged the role of statistics as a tool for empirical research.

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- As a result statistics is used for research in almost all professions, from medicine to sport.
- It is in one form or the other has become a common language by which agronomists, chemists, educators, *Programmers*, geneticists, political scientists, military strategists, medical researchers, sport managers, etc. read some portion of the world in which we live.

Contd…

- That is why we say:

" mathematics or the body of mathematical applications called statistics is the language in which we read the universe."

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WHAT
IS
STATISTICS??

Definition:

Statistics is the branch of mathematics that deals with the scientific methods of collecting, organizing, and analyzing data so as to make valid conclusions and reasonable decisions on the basis of such analysis.

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The raw materials for any statistical analysis are data which are the numerical information from which we make analysis and interpretation.

STEPS OF STATISTICAL INVESTIGATION

The field of statistics is concerned with the following basic steps:

- The situation being investigated should be carefully and fully defined
- Proper collection of data
- Organization and classification of data
- Presentation of data
- Interpretation of data

IMPORTANCE OF STATISTICS

- Statistics represents facts in the form of numerical data.
- Statistics condenses and summarizes a mass of data in to few presentable, understandable, and precise figures.
- Statistics facilitates classification and comparison of data.
- Statistics helps the central management and government in formulating policies.
- Statistics helps in predicting future trends.

LIMITATIONS OF STATISTICS

- Statistics does not deal with individual values.
- Statistics does not deal with qualitative characteristics.
- Statistical conclusions are not universally true.
- Statistical interpretation requires a high degree of skill and understanding of the subject.
- Statistics can be misused.

TERMINOLOGIES:

Definition 1:- A population in *statistical terms* is the set of elements that belong to the entire group.

Definition 2:- A summary measure that describes any given characteristic of the population is known as a parameter.

Definition 1:- A sample is a portion of the total population that is considered for study and analysis.

Definition 2:- A summary measure that describes a characteristic of the given the sample is known as a statistic.

TYPES OF STATISTICS

Definition 1:- The phase of statistics, which seeks only to describe and analyze a sample without drawing any conclusion about a population is called *descriptive statistics.*

Definition 2:- The phase of statistics, which deals with drawing important conclusions or predictions about a population from analysis of a sample is called *inferential statistics.*

2 Collection of Data

Definition:- *Collection of data* is gathering all the necessary information for the purpose of inquiry.

Example:-

a) in science the data resulting from experiment must be collected and analyzed.

b) in education descriptive measures are frequently used to describe test results.

c) in government many kinds of statistical data are collected all the time.

SCOPES OF STATISTICAL INVESTIGATIONS

Definition 1:- A population is the set of all Individuals of interest in a particular study.

Definition 2 :- A census is a survey in which observations are made on the entire population.

That is if every element in the population can be listed, or enumerated, and observed, then a census is compiled.

A census is 100% survey

Definition 3 :- A sample is a set of individuals selected from a population, usually intended to represent the population in a research study.

Definition 4 :- Sampling error is the discrepancy, or amount of error, that exist between the sample statistic and the population parameter.

ADVANTAGES AND DISADVANTAGES OF CENSUS AND SAMPLE SURVEY

Advantage of census:

- More accurate than sample survey.

Disadvantage of census:

- Very expensive
- Time taking
- Some times impossible due to different reasons.

Advantage of sample:

- It takes less time and less cost compared with census.

Disadvantage of sample:

- Less accurate.
- May not represent the given population

SAMPLING TECHNIQUES

Random Sampling Techniques

- Simple Random Sampling
- Systematic Random Sampling
- Stratified Random Sampling
- Cluster Random Sampling

Non Random Sampling Techniques

- Judgment Sampling
- Convenience Sampling
- Quota Sampling
- Purposive Sampling

SOURCE OF DATA

- Primary Data
  - Direct Observation
  - Telephone Interview
  - Personal Interview
  - Written Questionnaires
- Secondary Data