



**BIostatistics IN
HEALTHCARE AND SCIENCE
COMMUNICATION**



HELLO!

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Introduction To Biostatistics

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Biostatistics is a branch of Mathematics which deals with the collection, compilation, presentation, analysis and interpretation of numerical data or quantitative information of biological organism.

Meaning of Statistics:

- **To some it is an imposing form of mathematics.**
- **To others it is the numerical forms of facts and figures commonly finds in newspapers, journals, books, various reports, political speech, TV, Radio, etc. in the form of tables, charts & figures.**

- **Example:**

There are 932 females per 1000 males in India whereas in Russia there are 1170 females per 1000 males.

Numbers play an essential role in statistics.

- **Study of statistics involve methods of refining numerical information into useful forms.**
- **Statements contain facts and figures, and as such they are called statements of facts.**
- **Numerical information are highly convenient for communication and at the same time quite clear, precise and meaningful.**
- **An analysis of statements can help in framing suitable policies by the Government.**


- **Whenever numbers are collected and compiled they become statistics.**
- **In other words, the term statistics is considered with ways and means of presenting and handling of data, making inferences logically and drawing relevant conclusions.**
- **In addition to meaning data, statistics also refers to a subject just like mathematics having symbols, formulae, and theorems.**

In this sense statistics is a body of methods of obtaining and analyzing data.

- Thus, the word statistics refers either to quantitative information or to a method dealing with quantitative information.
 - Statistics may be used in plural or singular sense.
- Quantitative (numerical) information i.e. the statistics of birth, death, imports, exports, etc. are used in plural sense
 - Various statistical methods like mean or average, correlation, regression, measures of dispersion, analysis of variance, etc. are used in singular sense.

- The methods by which statistical data are analysed are called statistical methods.
- Thus, statistics deals with the collection, compilation, presentation, analysis and interpretation of quantitative information

- **The word ‘statistics’ has come from the Italian word ‘statesman’ or German word ‘statistik’ which means State.**
- **The term statistics was first used by Professor Gottfried Achenwall (1719 – 1772) to refer the subject matter as a whole.**

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- The word statistics appeared for the first time in the famous book, Elements of Universal Erudition by Baran J. F. Von Bielfeld and translated by W. Hooper in 1770.
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Biostatistics

- Application of statistics to data generated from living organisms
 - Mostly used to draw conclusions about disease prevalence, risk factors and efficacy of treatment interventions.

- Biostatisticians use different kind of data like
 - numerical data (age, weight)
 - categorical data (sex, disease)
 - status ordinal data (pain scale)
 - ratings and survival time data
- Biostatistics is the backbone of clinical research.
- Biostatisticians help in designing clinical trials with factors like sample size, randomization method, and statistical power. They assist in analyzing and gathering data, interpreting and reporting results.



Case Studies
Showing Role of
Biostatistics in Healthcare
and Science
Communication

1. Biostatistics during the clinical trial of a new drug

Biostatisticians play a critical role in designing a clinical trial for a new hypertensive drug.

They ensure that the trial has enough participants to detect a significant difference between new drugs and existing treatments while ensuring that the number of participants was logistically feasible .

After the trial was completed, they analysed the data to determine whether the new drug was effective and safe compared to other treatments

2. Biostatistics in Epidemiological Research

In a study looking at the risk factors for diabetes in a particular population, biostatisticians use statistical models to identify significant risk factors such as age, obesity and family history.

Their analysis guided public health interventions aimed at reducing diabetes prevalence.

Importance of Biostatistics in healthcare

- Biostatistics is not just about crunching numbers, it is about making informed decisions that impact patients lives by providing objective evidence.
- It guides decision making in healthcare and science communication from individual patient care to global policies.
- It also forms the basis of evidence based medicine .
- Furthermore, it helps to understand complex biological phenomena and analyzing large data sets.



Any question?



Thanks!
