

# What is the relationship between statistics and statistical inference?

Authored by  
**stats writer**

June 29, 2024

## RECOMMENDED CITATION

stats writer (2024). *What is the relationship between statistics and statistical inference?*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=159071>

Statistics is the branch of mathematics that deals with collecting, organizing, analyzing, interpreting, and presenting data. It provides a framework for understanding and making sense of large amounts of data. On the other hand, statistical inference is a process of drawing conclusions or making predictions about a population based on a sample of data. It uses statistical techniques and methods to make inferences and generalizations about a larger population. In simple terms, statistics provides the tools and techniques to collect and analyze data, while statistical inference allows us to make meaningful and accurate conclusions based on that data. Therefore, the relationship between statistics and statistical inference is that they work hand in hand to help us gain insights and make informed decisions based on data.

## Statistics - Statistical Inference

### Statistical Inference

Using data analysis and statistics to make conclusions about a population is called statistical inference.

The main types of statistical inference are:

Estimation Hypothesis testing

### Estimation

Statistics from a sample are used to estimate population parameters.

The most likely value is called a **point estimate**.

There is **always** uncertainty when estimating.

The uncertainty is often expressed as **confidence intervals** defined by a likely lowest and highest value for the parameter.

An example could be a confidence interval for the number of bicycles a Dutch person owns:

"The average number of bikes a Dutch person owns is between 3.5 and 6."

### Hypothesis Testing

**Hypothesis testing** is a method to check if a claim about a population is true. More precisely, it checks how likely it is that a hypothesis is true is based on the sample data.

There are different types of hypothesis testing.

The steps of the test depends on:

Type of data (categorical or numerical)If you are looking at:

A single groupComparing one group to anotherComparing the same group before and after a change

Some examples of claims or questions that can be checked with hypothesis testing:

90% of Australians are left handedIs the average weight of dogs more than 40kg?Do doctors make more money than lawyers?

## Probability Distributions

Statistical inference methods rely on probability calculation and probability distributions.

You will learn about the most important probability distributions in the next pages.

★+1 W3schools PathfinderTrack your progress - it's free!

Log in

Sign Up