

What is the relationship between parameters and statistics in the field of statistics?

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In the field of statistics, parameters and statistics are closely related concepts that play a significant role in understanding and analyzing data. Parameters refer to the characteristics or properties of a population, while statistics are measurements or calculations obtained from a sample of the population. Parameters are usually unknown and are estimated through the use of statistics. In other words, statistics are used to infer information about parameters. Additionally, the accuracy and reliability of statistics are dependent on the size and representativeness of the sample, while parameters remain constant for the entire population. Therefore, the relationship between parameters and statistics is essential in drawing conclusions and making predictions about a population based on a sample.

Statistics - Parameters and Statistics

The terms 'parameter' and (sample) 'statistic' refer to key concepts that are closely related in statistics.

They are also directly connected to the concepts of populations and samples.

Parameters and Statistics

Parameter: A number that describes something about the whole **population**.

Sample statistic: A number that describes something about the **sample**.

The parameters are the key things we want to learn about. The parameters are usually unknown.

Sample statistics gives us **estimates** for parameters.

There will always be some **uncertainty** about how accurate estimates are. More certainty gives us more useful knowledge.

For every parameter we want to learn about we can get a sample and calculate a sample statistic, which gives us an estimate of the parameter.

Some Important Examples

Parameter	Sample statistic
Mean	Sample mean
Median	Sample median
Mode	Sample mode
Variance	Sample variance

Standard deviation	Sample standard deviation
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Mean, median and mode are different types of averages (typical values in a population).

For example:

The typical age of people in a country
The typical profits of a company
The typical range of an electric car

Variance and **standard deviation** are two types of values describing how spread out the values are.

A single class of students in a school would usually be about the same age. The age of the students will have **low** variance and standard deviation.

A whole country will have people of all kinds of different ages. The variance and standard deviation of age in the whole country would then be **bigger** than in a single school grade.

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