

Descriptive Statistics ^[1]

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Descriptive statistics implies a simple quantitative summary of a data set that has been collected. It helps us understand the experiment or data set in detail and tells us everything we need to put the data in perspective.

In descriptive statistics, we simply state what the data shows and tells us. Interpreting the results and trends beyond this involves inferential statistics ^[3] that is a separate branch altogether.

For example, if an experiment is conducted to understand the effect ^[4] of news stories on a person's risk taking behavior, the experimenter might start by making one control group ^[5] read news stories involving huge risks but great payoffs while the other group reads successful stories of investing with minimal risk. Both the groups might then be given virtual or real money to invest in stocks and the experimenter can note the differences in risk-taking behavior, if any, between the two groups.

The data collected can be represented in several ways. For example, it might be seen that the first group engaged in higher risk behavior and this might be quantified in various ways. The description of this behavior, its mean, the corresponding graphical representation of the data, etc. all fall under the purview of descriptive statistics ^[6]. But concluding from this data that what one reads in the news is likely to influence the kind of investment decisions one makes in the future will come under inferential statistics ^[3].

Basic Descriptive Statistics

Many of the statistical averages ^[7] and numbers we quote are in effect descriptive averages. For example the Dow Jones Industrial Average tells us about the average performance of select companies. The grade point average tells us about the average performance of a student at university. The GDP growth rate tells us about the average performance of a country.

Thus descriptive statistics tries to capture a large set of observations ^[8] and gives us some idea about the data set ^[9]. The measures of central tendency ^[10] like mean ^[11], median ^[12], mode ^[13] all come under this category, as do data distributions like normal distribution ^[14] and corresponding standard deviations ^[15].

For example, in our previous example, the relevant data such as the sample size ^[16], the

demographics of the people involved in the study, their previous financial exposure, their average age, gender, etc. might all be relevant to someone who wants to understand the experiment [17] and perhaps replicate [18] it in a different experiment.

Data can also be represented in the form of graphs or histograms to better understand what is happening in the experiment. These too come under descriptive statistics.

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Links

- [1] <https://staging.explorable.com/en/descriptive-statistics>
- [2] <https://staging.explorable.com/en>
- [3] <https://staging.explorable.com/inferential-statistics>
- [4] <https://staging.explorable.com/cause-and-effect>
- [5] <https://staging.explorable.com/scientific-control-group>
- [6] <http://www.socialresearchmethods.net/kb/statdesc.php>
- [7] <https://staging.explorable.com/statistical-mean>
- [8] <https://staging.explorable.com/scientific-observation>
- [9] <https://staging.explorable.com/statistical-data-sets>
- [10] <https://staging.explorable.com/measures-of-central-tendency>
- [11] <https://staging.explorable.com/arithmetical-mean>
- [12] <https://staging.explorable.com/calculate-median>
- [13] <https://staging.explorable.com/statistical-mode>
- [14] <https://staging.explorable.com/normal-probability-distribution>
- [15] <https://staging.explorable.com/measurement-of-uncertainty-standard-deviation>
- [16] <https://staging.explorable.com/sample-size>
- [17] <https://staging.explorable.com/conducting-an-experiment>
- [18] <https://staging.explorable.com/replication-study>