Margin of Error (Statistics) [1]

In statistics margin of error plays a very important role in many social science experiments, surveys, etc.

The margin of error determines how reliable the survey is or how reliable the results of the experiment [3] are.

Any survey takes a sample population from the whole population [4] and then generalizes [5] the results [6] to the whole population. This invariably leads to a possibility of error [7] because the whole can never be accurately described by a part of it.

This is captured in statistics as margin of error. The higher the margin of error, the less likely it is that the results of the survey are true for the whole population.

In statistics margin of error [8] is related to the confidence interval [9] as being equal to half the interval length. This means higher the confidence interval, higher the margin of error for the same set of data. This is expected because to get a higher confidence interval, one usually needs higher data points. It is also quite expected that as the number of samples increases, the margin of error decreases.

The margin of error is usually expressed as a percentage, but in some cases, may also be expressed as the absolute number. In statistics margin of error makes the most sense for normally distributed data, but can still be a useful parameter otherwise.

With margin of error, the statistics represented by the survey make sense. If a survey finds that 36% of the respondents watch television while eating lunch, the information is incomplete. When the margin of error is specified, say, 4%, then this means the 36% should be interpreted as 32-40%. This makes complete sense.

However, there are scenarios in statistics when margin of error is unable to take care of the error of the survey. This happens when the survey has poorly designed questions or the respondents have other bias [10] in their answering or are lying for some reason. Also, if the sample is not chosen to be representative of the whole population, errors beyond the margin of error may occur.

Source URL: https://explorable.com/statistics-margin-of-error?gid=1590

Links
[1] https://explorable.com/statistics-margin-of-error
[2] https://explorable.com/users/siddharth

[3] https://explorable.com/conducting-an-experiment
[4] https://explorable.com/research-population
[5] https://explorable.com/what-is-generalization
[6] https://explorable.com/statistically-significant-results
[7] https://explorable.com/experimental-error
[8] http://www.robertniles.com/stats/margin.shtml
[9] https://explorable.com/statistics-confidence-interval
[10] https://explorable.com/research-bias