**Sampling Distribution**

**Name**

**Affiliation**

**Date**

Random samples obtained from a population are, by their nature, unpredictable. It would not be expected that two random samples of the same size and taken from the same population have the same sample mean or are completely similar; It can be expected that any statistic, such as the sample mean, calculated from the means in a random sample, changes its value from one sample to another, therefore, the distribution of all possible values ​​of a statistic is studied. Such distributions are very important in the study of inferential statistics because inferences about populations are made using sample statistics.

Since the values ​​of a statistic, such as x, vary from one random sample to another, it can be considered as a random variable with its corresponding frequency distribution. The frequency distribution of a sample statistic is called the sample distribution. In general, the sampling distribution of a statistic is that of all its possible values ​​calculated from samples of the same size. As an example, considering that the random samples of size 20 have been selected in a large population. Sample x is calculated for each sample; the collection of all these sample means is called the sample distribution of means. A sample distribution is generated by extracting all the possible samples of the same size from the population and calculating their statistic. If the population from which the samples are taken is normal, the sample distribution of means will be normal regardless of the sample size (Lipson, 2003).

A sampling can be done with or without replacement, and the starting population can be infinite or finite. When considering all the possible samples of size n in a population, for each sample the statistic (mean, standard deviation, proportion ...) can be calculated that will vary from one to another. Thus, a distribution of the statistic is obtained that is called sampling distribution (Lumen, 2018).

## References

Lipson, K. (2003). The Role of the Sampling Distribution in Understanding Statistical Inference. Retrieved from https://files.eric.ed.gov/fulltext/EJ776331.pdf

Lumen. (2018). Sampling Distributions | Boundless Statistics. Retrieved from https://courses.lumenlearning.com/boundless-statistics/chapter/sampling-distributions/