

Confidence Interval for Relative Frequency - Sampling with Replacement

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Abstract: In practical problems are often solved the building of estimation of the proportion for selection with replacement and without replacement. From the viewpoint of statistics it means finding a point or interval estimate of an unknown parameter value for alternative (first task - sampling with replacement) or hypergeometric distribution (second task - sampling without replacement). Alternative and hypergeometric distributions are discrete. When we build confidence intervals for unknown parameters we often use approximation by continuous distributions (such as normal or F-distribution). Depending on the approximation we can obtain different results with different value of errors. The results are, of course, vary depending on whether we are working with a selection without replacement or admit selection with the replacement. Between the two types of selections will not be much difference if the sample size is large enough - we can rely on central limit theorem. We compare the accuracy of different approximation methods in our article and we will suggest own, very simple, accurate and efficient way to determine the limits of the confidence interval for an unknown parameter without using of specialized statistical software.

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