

Kanokkan Sasiwimonrit 2015: A Comparison of Confidence Interval Estimation Methods for the Difference between Two Independent Population Proportions for Small Sample Size. Master of Science (Statistics), Major Field: Statistics, Department of Statistics. Thesis Advisor: Associate Professor Apinya Hirunwong, Ph.D. 106 pages.

The purpose of this research was to compare confidence interval estimation methods for the difference between two independent population proportions with small sample Size. The criteria to select suitable confidence interval were the coverage probability must not lower than the specified confidence coefficient and the shortest expected length. The estimation methods under consideration in this study were Classical method, Newcombe method, Peskun method, Adding-4 method and Recentered method. The comparison was done under conditions of two cases of sample size: $n_1 = n_2$ and $n_1 = 1.5n_2$ where the value of n_2 were 5, 10, 15, 20, 25 and 30. The absolute of difference between two population proportions ($p_1 - p_2$) were repeated from 0 to 0.8 increasing by 0.1. The coefficient confidence value was 0.95 and 0.99. The simulation of this study was repeated 50,000 times in each situation by using the SAS 9.1.3 program. The conclusion of this study was as follow:

Newcombe method was good for $p_1 - p_2$ were 0.3 to 0.5 and sample size was $n_1 = n_2$. Adding-4 method was good when 0.99 coefficient confidence and $p_1 - p_2$ were 0.5 to 0.8. Peskun method had the coverage probability not lower than the specified confidence coefficient but the expected length was longer than the other methods. Classical method had the coverage probability lower than the specified confidence coefficient except when $p_1 - p_2$ was 0.0 and the expected length was longer than the other methods. Recentered method had the coverage probability not lower than the specified confidence coefficient and the expected length was shorter than the other methods.

Student's signature

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