Sudarat Nidsunkid 2010: Interval Estimation for the Difference between Independent Proportions: Comparison of Four Methods . Master of Science (Statistics), Major Field: Statistics, Department of Statistics. Thesis Advisor: Associate Professor Prasit Payakkapong, M.S. 106 pages.

The objective of this research is to compare the interval estimation methods for the difference between independent proportions. The methods under consideration in this study are the Wald method, the Adding-4 method, the T2 method, and the Recentered method. Determinations the sample sizes of two populations are $n_1 = n_2$ and $n_1 = 1.5n_2$, and the values of n_2 are set at 10, 30, 60, 100, 500 and 1,000. The values assigned to the first binomial proportions (p_1) range from 0.1 to 0.9 with an increase of 0.1. The second binomial proportion (p_2) is set at 0.1, $p_1 - p_2$ range from 0.0 to 0.8 with increment of 0.1. Confidence coefficient is determined to be 0.95 and 0.99. The simulation of this research is repeated 50,000 times in each situation by the application of the SAS 9.1.3 Statistical Package. The criteria to select the suitable confidence interval method are the coverage probability should not lower than the specified confidence coefficient and the shortest average width. The conclusions of the appropriate methods of this study are as follow:

For 0.95 and 0.99 confidence coefficient, The Wald method is suitable for large sample sizes ($n_1, n_2 \geq 500$), due to the average width which is as short as the others methods, however less complex to calculate. The Adding – 4 method is good for $n_1 = n_2 = 10$ and $p_1 - p_2$ are 0.4 – 0.6. The confidence interval from T2 method had the coverage probability not lower than the specified confidence coefficient but the average width was longer than the other methods. Lastly, the Recentered method is suitable for almost every case of study, except as noted above.

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