

Abstract

Objectives of this research are to develop confidence interval for population proportion by modifying Wilson method for the complex sample. This research also aims to compare the performance of the propose method with the original Wilson method. We modify the Wilson method for the complex sample by adjusted the original sample size with the design effect. The adjusted sample size is then called effective sample size. The design effect is calculated by ratio of the sample variance estimator from complex sampling (use Jackknife method) and from simple random sampling. The stratified two-stage cluster sampling is used in this research. We name of our modifying Wilson method as Wilson with an effective sample size method.

This research is Monte Carlo simulation study. We consider both equal and unequal number of population in each group of each stratum. The small sample and large sample are specified by 3% and 7%, respectively, of population in each group. The evaluation of the performance of the modified Wilson and original Wilson methods is based on confidence coefficient and average length of confidence interval under different sample sizes (small and large), total population proportions (0.1, 0.2, 0.3, 0.4, 0.5, and 0.6), and confidence coefficients (0.95 and 0.99). The method that yields a confidence coefficient lies in the acceptance interval of confidence coefficient and gives a narrow of the average length of confidence interval from 1,000 runs is considered as an effective method.

The results can be concluded following: both the modified Wilson and original Wilson methods provide the confidence coefficient lies the mostly in the acceptance interval of specified confidence coefficient for some conditions of both equal and unequal number of population in each group of each stratum, sample size, total population proportions and confidence coefficient. When considering the average length of confidence interval, we can be concluded into 2 cases accordingly to the number of population of each group. For equal number of population in each group of each stratum, the results revealed that modified Wilson method is a more effective method than the original Wilson method for all conditions of sample size, for some the

total population proportions when the 0.99 confidence coefficient. For unequal number of population in each group of each stratum, the results found that modified Wilson method is a more effective method than the original Wilson method for all the total population proportions, confidence coefficient where small sample size.