KSUC-OI-003

Confidence interval for the standard deviation of a normal distribution with a known coefficient of variation and a restricted population mean

Wararit Panichkitkosolkul

Department of Mathematics and Statistics, Faculty of Science and Technology, Thammasat University, Phathum Thani, 12120, Thailand

Corresponding author: wararit@mathstat.sci.tu.ac.th

Abstract

This paper introduces the confidence interval for the standard deviation of a normal distribution with a known coefficient of variation and a restricted population mean. The situation in which the coefficient of variation is known occurs in many fields such as agriculture, biology, and the environmental and physical sciences. The proposed confidence interval follows the method introduced by Wang (2008). A Monte Carlo simulation study was undertaken to compare the performance of the new proposed confidence interval with the existing confidence interval based on the chi-square statistic. The simulation results showed that the new proposed confidence interval performs much better than the existing confidence interval in terms of expected length. A real data set are analyzed to illustrate the findings of the paper.

Keywords: Estimation, Normal distribution, Measure of dispersion, Parameter space, Simulation