

PERFORMANCE OF CONFIDENCE INTERVALS FOR THE MEAN OF POISSON POPULATIONS EVALUATED BY MONTE CARLO SIMULATIONS

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- **ABSTRACT:** *Many approximations to confidence intervals for the parameter λ of a Poisson population exist in the literature. The present work was made with the main objective to evaluate, by simulation, the proprieties of asymptotes procedures to confidence interval for the parameter λ of Poisson. Three asymptotic and the exact intervals were studied. The simulations were performed in R statistical software. The specific objectives were reach an explicit solution for Hall (1982)'s interval and generalize the Begaud (2005)'s interval for the case where $n > 1$. As proposed, an explicit solution for the interval of Hall (1982) has been achieved. The approximated confidence interval of Begaud (2005) was generalized to sample sizes greater than 1. The three asymptotic intervals have shown equivalent performance to the exact interval with respect to the coverage probability to $\lambda \geq 5$ and $n > 1$. With $n=1$ and $\lambda \geq 5$, the Begaud (2005) interval show the best performance. Regards to the interval lengths, for $\lambda \geq 5$ and $n > 1$, the performance of the confidence intervals followed the order, from the best (shorter) to the worst (longest) case: Hall (1982), Ferreira (2009), Begaud 2005) and exact. As in small samples, for small values of λ , the approximations had low performance and λ is unknown, it is recommended to use the exact interval, except when some results should be built and exact theories are not available and are difficult or impossible to construct.*
- **KEYWORDS:** *Normal approximation of Poisson; interval length; coverage probability, Monte Carlo.*

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