A generalized exponential growth model under adaptive cluster sampling

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Detecting, monitoring or estimating the abundance of rare, elusive and clustered populations can be a challenging task. Adaptive cluster designs are generally applied to obtain information from those populations. On the other hand, in some situations the variable of interest can vary with time. The aim of this work is to make inferences about those populations using a model based approach, when the data are obtained from an adaptive cluster sample. In particular, our main interest is to predict the population total where the variable of interest either increases or decreases with time. The proposed model is evaluated using simulated data and compared to other current approaches in the literature, including the design-based modified Horvitz-Thompson estimator. The results show that the proposed model is more efficient and flexible than other common approaches.

Keywords: informative sampling, network model, MCMC.