Title: Lindley binomial model: A flexible approach for modelling the proportions with sparseness and excessive zeros

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Abstract: In this paper, we present a new modelling approach for the proportions with sparseness and excessive zeros. The distribution of proportional data typically exhibits overdispersion, zero-inflation and sparseness and heavy tails. We propose a new Lindley binomial distribution, by compounding the two-parameter Lindley family of distributions with the binomial distribution. This distribution can flexibly handle each of the aforementioned features of proportional data. We study the probabilistic properties of this distribution such as moment, moment generating function and develop a computational approach to accurately evaluate the likelihood of proposed model and to perform the penalized maximum likelihood estimation via EM algorithm. We assess the performance of our developed algorithm for the estimation of parameters in the proposed model with/without covariates and demonstrate the application to Incidence of Hepatitis A and Yellow Fever data.

Biography of Dr. Deng

Dr. Deng is a full Professor at the Department of Mathematics and Statistics, University of Regina He got his Bachelor degree in Mathematics and Master degree in Probability and Mathematical Statistics both from Jilin University, China. He then continued to pursue his graduate studies in Canada and obtained his Master and PhD degrees in Statistics from University of Windsor. Dr. Deng is mainly engaged in theoretical research of probability theory and statistics and its application in biological and medical sciences. He has published more than 40 academic papers in peer reviewed journals including Journal of Royal Statistical Society (B), Journal of Multivariate Analysis, Statistics in Medicine, Journal of Mathematical Analysis and Applications, Statistical Methods in Medical Research and Journal of Biopharmaceutical Statistics. He is reviewer and/or referee for more than 20 journals such as J. Nonp. Stat., Can. J. Stat., Biometrics, Stat. Med., J. Multi. Anal., J. Appl. Stat., J. Stat Comput. Simul., Stat. Sinica, Ann. Appl. Stat., Stat. Methods in Med. Res., Appl. Math. Modelling, and Stat. and Its Interface.