

A Survey on Quasi-Likelihood Estimation Approaches for Longitudinal Set-ups

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Abstract : The Com-Poisson (CMP) model is one of the most popular discrete generalized linear models (GLMS) that handles both equi-, over- and under-dispersed data. In longitudinal context, an integer-valued autoregressive (INAR(1)) process that incorporates covariate specification has been developed to model longitudinal CMP counts. However, the joint likelihood CMP function is difficult to specify and thus restricts the likelihood based estimating methodology. The joint generalized quasiliikelihood approach (GQL-I) was instead considered but is rather computationally intensive and may not even estimate the regression effects due to a complex and frequently ill conditioned covariance structure. This paper proposes a new GQL approach for estimating the regression parameters (GQLIII) that are based on a single score vector representation. The performance of GQL-III is compared with GQL-I and separate marginal GQLs (GQL-II) through some simulation experiments and is proved to yield equally efficient estimates as GQL-I and is far more computationally stable.

Keywords : longitudinal, com-Poisson, ill-conditioned, INAR(1), GLMS, GQL

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020