Nonparametric Models for Multivariate Panel Count Data

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Panel count data consists of event counts that have occurred at unknown time points between observation times. It is often seen in clinical and health expenditure studies. While methods of analyzing univariate panel count data have been proposed, the analysis of multivariate panel count data has not been investigated. This analysis is important when there are multiple types of recurrent events of interest. We propose nonparametric estimators of mean functions of counting processes for bivariate panel count data based on the maximum pseudo-likelihood estimators (Sun and Kalbfleisch (1995) [*Statistica Sinica* 5 (1995):279–290] and Wellner and Zhang [*The Annals of Statistics* 28 (2000):779–814]. Based on the Poisson models, we assume that the overdispersion comes through the unobserved frailty which affects the conditional mean function of the counting processes. The methods are illustrated via a analysis of data from a cancer chemoprevention trial on the effectiveness of difluoromethylornithine (DFMO) in preventing the non-melanoma skin cancer.

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