

Analysis of Recurrent Episodes Data: the Length-Frequency Tradeoff

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Abstract

I consider a special type of recurrent event data, "recurrent episode data" in which when a event occurs it last for a random length of time. Recurrent episode data arise frequently in studies of episodic illness. A naive recurrent event analysis disregards the length of each episode, which may contain important information about the severity of the disease, as well as the associated medical cost and quality of life. Analysis of recurrent episode data can be further complicated if the effects of treatment and other prognostic factors are not constant over the observation period, as occurs when the covariate effects vary across episodes. I will review existing methods applied to recurrent episode data and approach the length-frequency tradeoff using recently developed temporal process regression. Novel endpoints are constructed which summary both episode length and frequency. Time varying coefficient models are proposed, which capture time varying covariate effects. New and existing methods are compared on data from a clinical trial to assess the efficacy of a treatment for cystic fibrosis patients experiencing multiple pulmonary exacerbations.