Neyman, Markov Processes and Survival Analysis

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Abstract

In a 1960 paper, J. Neyman stated, "The time has arrived for the theory of stochastic processes to become an item of usual equipment of every applied statistician." By the time of his death in 1981, it is questionable if this time has actually arrived. Needless to say, Neyman has used stochastic processes extensively, particularly the Markov processes, in his applied work. One example is the use of Markov models for follow-up studies in cancer treatments. This gives rise to the celebrated Neyman-Fix competing risks model. In this talk we revisit the Neyman-Fix model and one of its extensions to a non-parametric analysis by Altshuler (1970). This will be followed by a comparison with the current development of the survival analysis. We shall illustrate that the Markov models advocated by Neyman offers a very general approach to tackle many of the problems in survival analysis.

Keywords: Competing risks; Survival analysis; First passage times; Staging; Prevalence; Neyman-Fix model.

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