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by Govert Bijwaard

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forthcoming as "Multistate event history analysis with frailty" in: Demographic Research

Abstract:

In survival analysis a large literature using frailty models, or models with unobserved heterogeneity, exist. In the growing literature on multiple spell multiple states duration models, or multistate models, modeling this issue is only at its infant phase. Ignoring unobserved heterogeneity can, however, produce incorrect results. This paper presents how unobserved heterogeneity can be incorporated into multistate models, with an emphasis on semi-Markov multistate models with a mixed proportional hazard structure. First, the aspects of frailty modeling in univariate (proportional hazard, Cox) duration models are addressed and some important models with unobserved heterogeneity are discussed. Second, the domain is extended to modeling of parallel/clustered multivariate duration data with unobserved heterogeneity. The implications of choosing shared or correlated unobserved heterogeneity is highlighted. The relevant differences with recurrent events data is covered next. They include the choice of the time scale and risk set which both have important implications for the way unobserved heterogeneity influence the model. Multistate duration models can have both parallel and recurrent events. Incorporating unobserved heterogeneity in multistate models, therefore, brings all the previously addressed issues together. Although some estimation procedures are covered the emphasis is on conceptual issues. The importance of including unobserved heterogeneity in multistate duration models is illustrated with data on labour market and migration dynamics of recent immigrants to The Netherlands.

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