

Nonparametric Significance Testing for Continuous Covariates in Multi-State Transition Probabilities

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Abstract.

Incorporating subject-specific covariates into the estimation of conditional transition probabilities is a common objective in multi-state modeling. Consequently, it is essential to formally test whether such continuous variables affect the transition dynamics.

This work presents a novel, fully nonparametric testing procedure designed to determine the statistical significance of a quantitative covariate on conditional transition probabilities. Specifically, the proposed test evaluates if the probability of moving between distinct states across specified time intervals is significantly driven by the covariate's value. The empirical behavior and reliability of this methodology have been assessed through extensive simulation studies.