

Frailties in multi-state models: Are they identifiable? Do we need them?

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The inclusion of latent frailties in survival models can serve two purposes: i) the modeling of dependence in clustered data ii) explaining lack of fit of univariate survival models, like deviation from the proportional hazards assumption.

Multi-state models are somewhere between univariate data and clustered data. Frailty models can help in understanding the dependence in sequential transitions (like in clustered data) and can be useful in explaining some strange phenomena in the effect of covariates in competing risk models (like in univariate data).

The (im)possibilities of frailty models will be exemplified on a data set of breast cancer patients with death as absorbing state and local recurrence and distant metastasis as intermediate events.