Dynamic prediction in event history analysis

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Title: Dynamic prediction in event history analysis
Issue Date: 2019-06-13

Stellingen behorend bij het proefschrift getiteld
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1. *The choice of timescale depends upon the data and research question at hand. If the event of interest is death, then the age timescale will often be an attractive choice because it accounts for age in a natural way. However, disease duration may offer a more appropriate biological interpretation of the model. On the other hand, it may be that central covariates are only measured upon entry into the study, which would make the time on study timescale more reasonable.* [Chapter 0, this thesis]

2. *The effect of a covariate on the survival probability may not be constant over time. These changes are more prominent than current statistical models account for, which could lead to the risk of developing less effective treatment guidelines. Therefore, survival prediction models need to be adapted for long-term outcome prediction in individual patients.* [Chapter 1, this thesis]

3. *Although both direct binomial regression and the pseudo-observations estimate the direct effect of the covariates on the competing event of interest, the interpretation depends on the link function and not all link functions result in a probabilistic interpretation. The estimated effects in the cause-specific approach always have a probabilistic interpretation, but they do not directly translate into an effect on the event of interest.* [Chapter 2, this thesis]

4. *So despite the fact that the simple pseudo-observation uses more subjects than the stopped pseudo-observation, those extra subjects do not seem to add any information of value.* [Chapter 4, this thesis]

5. *Unfortunately, choice of therapy based on prognostic models will directly affect the validity of such models, but nevertheless prognostic models are needed even if they are self-destroying.* [H. C. van Houwelingen and H. Putter, Chapman&Hall/CRC Press, 2012]

6. *Imposing the incorrect proportional hazards assumption may either create a 'spurious' nonlinear or time-varying effect or mask the true nonlinear or time-varying effect of the same covariate.* [W. Wynant and M. Abrahamowicz, Statistics in Medicine, 2014]

7. *In longitudinal studies in which some subjects die ... [employing] random effects models (which are unconditional with respect to survival) may implicitly impute data beyond death. Implicit imputation is a fundamental strength of random effects models in the missing data context, but limits the suitability of these unconditional models in analyzing longitudinal data with great imbalance due to death.* [Kurland et al., Statistical Science, 2009]

8. *The Aalen–Johansen estimators of the stage occupation probabilities constructed from the integrated transition hazards via product integration are consistent for a general multistage model that is not Markov.* [S. Datta and G. A. Satten, Statistics and Probability Letters, 2001]

9. *Life can only be understood backwards, but must be lived forward.* [S. A. Kierkegaard, Danish philosopher, 1813-1855] I think this quote nicely emphasises why we need prediction models.

10. *Everything should be made as simple as possible, but not simpler.* [A. Einstein, German theoretical physicist, 1879-1955] It is popular to use more and more complex prediction models, but I find it useful to use simpler models as long as they perform almost as well.