

Department of Industrial Systems Engineering & Management, NUS, Singapore

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on

On proportional hazard model with last value carried forward covariates

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Abstract: Standard partial likelihood methodology for the proportional hazards model with time-dependent covariates requires knowledge of the covariates at the observed failure times, which is not realistic in practice. A simple and commonly used estimator imputes the most recently observed covariate prior to each failure time, which is known to be biased. In this paper, we show that a weighted last observation carried forward approach may yield valid estimation. We establish the consistency and asymptotic normality of the weighted partial likelihood estimators and provide a closed form variance estimator for inference. The estimator may be conveniently implemented using standard software. Interestingly, the convergence rate of the estimator is slower than the parametric rate achieved with fully observed covariates but the same as that obtained with all lagged covariate values. Simulation studies provide numerical support for the theoretical findings. Data from an Alzheimer's study illustrate the practical utility of the methodology.

Biography: Hongyuan Cao is an assistant professor of statistics at University of Missouri-Columbia. She got her Ph.D. in statistics from UNC-Chapel Hill in 2010. She published over 20 papers among which several are in top statistics journals, such as *Biometrika*, *Journal of the American Statistical Association* and *Journal of The Royal Statistical Society, Series B*. Her research interests include High dimensional and large scale statistical analysis, survival analysis, longitudinal data analysis and Bioinformatics.

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