mvna, a R-package for the Multivariate Nelson–Aalen Estimator in Multistate Models

A. Allignol[1,2,*] J. Beyersmann[1,2] M. Schumacher[2]

[1]Freiburg Center for Data Analysis and Modelling,
Freiburg University, Germany
[2]Institute for Biometry and Medical Informatics,
Freiburg Medical Center, Germany
*arthur.allignol@fdm.uni-freiburg.de

Abstract. The multivariate Nelson–Aalen estimator of cumulative transition hazards is the fundamental nonparametric estimator in event history analysis (Andersen et al., 1993, chap. IV). However, and to the best of our knowledge, there is not yet a multivariate Nelson–Aalen R-package (R Development Core Team, 2007) available, and the same appears to be true for SAS and Stata. Therefore, we have developed the **mvna** package (Allignol et al.) with convenient functions for estimating and plotting the Nelson–Aalen estimates in any multistate model, possibly subject to independent right–censoring and left–truncation. The usefulness of this package is illustrated with two important data examples from event history analysis: competing risks and time–dependent covariates, in which displaying estimates of the cumulative transition hazards provides useful insights and straighforwardly illustrates results from standard Cox analyses.

References

A. Allignol, J. Beyersmann, and M. Schumacher. **mvna**: A R-package for the multivariate Nelson–Aalen estimator in multistate models. Submitted to *R news*.

P. K. Andersen, O. Borgan, R. D. Gill, and N. Keiding. *Statistical models based on counting processes*. Springer-Verlag, New-York, 1993.

R Development Core Team. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria, 2007. URL `http://www.R-project.org`. ISBN 3-900051-07-0.

Keywords

COMPETING RISKS, CUMULATIVE TRANSITION HAZARDS, EVENT HISTORY ANALYSIS, TIME–DEPENDENT COVARIATE