TOPICS IN EVENT HISTORY ANALYSIS FOR ORAL HEALTH RESEARCH

T. Gerds

Universität Freiburg, Freiburg, Germany

† E-mail: gerds@fdm.uni-freiburg.de

Event history analysis provides a sensitive framework for analyzing the temporal performance of materials and their processing, and for comparing the follow-up of different treatments. The statistical inference on event histories in dentistry is often confronted simultaneously with the following obstacles: event times are interval censored where each patient is allowed to have a different number of observation times; each patient contributes a different number of study subjects (teeth, fillings, implants, etc) leading to clustered, mutually dependent observations; and frequently, the simple survival model is inappropriate, and parameters of interest have to be defined within the context of a competing risks model.

The subject matter of this talk is multi-state modeling illustrated by two relevant applications: fillings in primary teeth and dental implants. We discuss how to present the results of clinical studies. Then we investigate adaptations of the nonparametric maximum likelihood estimator (NPMLE), which reduces to the product limit method in several cases of interest, to the complex observational patterns. Further topics are variance and confidence interval estimation.