Statistics in Practice: Longitudinal Data Analysis (13. March 2014)

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Education for Statistics in Practice
In 2010 the German Region of the IBS started a series of lectures called ‘Education for Statistics in Practice’. The aim was to implement continuing education for researchers at all stages of their career. To reach a broad audience we integrated the series into the main program of the German Region’s annual meetings, as part of the regular conference (not a pre or post conference workshop). So far, ‘Education for Statistics in Practice’ has taken place four times and has been a great success; thus far, it has been extremely well received. Based on our excellent experiences we will continue to expand the series at the International Biometric Conference in Florence, Italy, in July 2014. For this year’s lecture, it is our pleasure that Geert Molenberghs is presenting the analysis of Longitudinal Data.

Longitudinal Data Analysis by Geert Molenberghs
Starting from case studies, modelling of longitudinal data with introductory practical illustrations in statistical software is considered. A rationale for the use of random-effects models for longitudinal, multilevel, and otherwise hierarchical data is given. Such models are formulated for the various case studies. Estimation, inference, and interpretation is discussed. For continuous outcome, emphasis is placed on the linear mixed model. Attention is given to: the difference between marginal and hierarchical interpretation, empirical Bayes estimation of random effects, and implementation.

Both marginal and hierarchical extensions towards non-Gaussian outcomes, most prominently binary outcomes, are discussed. Precisely, the focus in this part is on generalized estimating equations and the generalized linear mixed model is touched upon.

Case studies are chosen to present the picture frame so as to cover major features of hierarchical data on the one hand, and various application areas on the other, including clustered data, epidemiological studies, preclinical experiments, case-control trials, and health surveys.

References

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