

MODELS FOR DISCRETE LONGITUDINAL DATA

G. Molenberghs and G. Verbeke

Springer, New York, 2005

ISBN 0-387-25144-8

pp. 687 + XXII, 61 illustrations, hardcover

This book covers a wide variety of statistical techniques for longitudinal data analysis. The authors, Geert Molenberghs and Geert Verbeke –both well known in this field– have extended their previous textbook (Verbeke and Molenberghs, 1997), mainly focused on linear mixed model for continuous data, to the non-Gaussian setting, including binary, ordinal, and counts repeated measures.

The book has 32 chapters divided in six main sections. It starts (Section I: Chapters 1 to 5) by providing a general perspective of generalised linear models and extensions to linear mixed models for Gaussian longitudinal data. Following sections are focussed on the special non-linear models, showing and examining differences between the classes of marginal (Section II: Chapters 6 to 10), conditional (Section III: Chapters 11 and 12) and subject-specific (Section IV: Chapters 13 to 16) models. In these sections, approximate numerical methods are shown for each model, including a description of its advantages and limitations. Many practical examples are provided in these sections. In addition, Section V presents a set of case-studies (Chapters 17 to 20) showing how different problems, mainly from the pharmaceutical and medical research field, may call for different models presented in previous chapters. Finally, the authors show how to deal with missing data in longitudinal studies (Section IV, Chapters 26 to 32).

The book is clearly written, and the theoretical bases for the different models described in all sections are comprehensively treated. However, the authors prefer to emphasize practice rather than mathematical enhancements. For this reason, a large number of practical examples using SAS procedures, such as MIXED, GENMOD GLIMMIX, NLMIXED, MI, and MIANALYZE, are presented as illustrations. A limited number of examples are also analysed using other statistical software, such as S-Plus or MLwiN. Selected programs, macros and datasets used as examples in the book are available at the authors' web site (<http://www.censtat.be/research/software.asp>).

In summary, this book provides very useful guidance and advice on practical issues when dealing with longitudinal studies, specially for non-Gaussian data, and is an essential and highly recommendable reference for applied statisticians and other researchers in this field.

References

Verbeke, G. and Molenberghs, G. (1997). *Linear Mixed Models for Longitudinal Data*. Springer: New York.

Aurelio Tobías
Departament de Matemàtiques
Universitat Autònoma de Barcelona