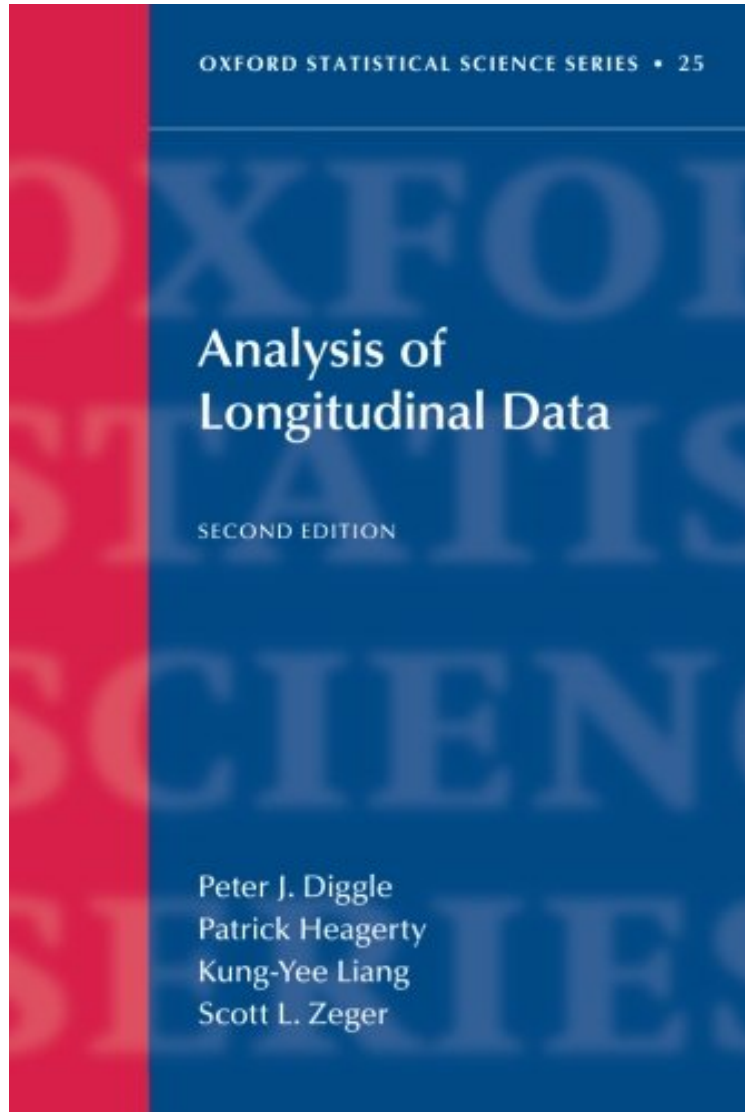


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Analysis of Longitudinal Data (Oxford Statistical Science Series)

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The first edition of this book was a major success as for the first time advanced methods for the use of longitudinal data were introduced. Longitudinal data (sometimes also referred to as repeated measures data) is very important in the analysis of clinical trial data. This is because many important trial endpoints are collected for each patient at several visits over the course of the trial and the study sponsor (usually the manufacturer of a drug or a device) will want to see how the measures change over time with usually the baseline measurement and the last measurement being the most important. Often they want to see in a randomized trial whether the treatment over interest tends to perform better for the subjects taking the test treatment versus those who take the active control and/or placebo. An issue is the presence of correlation between measurements from one time point to another. So this type of analysis is similar to time series analysis. The difference is that time series are usually studied in the situation where a single series is observed for a long time and the analyst wants to determine future behavior based on a model constructed to fit this one observed series very well. The model is intended in the time series setting to describe a stochastic process (usually a stationary process or one transformed to stationarity by removal of trends). On the other hand in longitudinal analysis each patients profile over time is usually a very short series and the collection of these series over several patients in a particular treatment group are view to come from the same stochastic process. So the data represent several short partial realizations of the stochastic process while a time series is a long, single partial realization. Since the data differ the methods of analyses differ also. For time series analysis the autoregressive integrated moving average models of Box and Jenkins are often employed while for longitudinal data the mixed effect linear models are often the class of models chosen. The common theme is the structure of the covariance matrix for the observations in time series and the model noise terms in the case of the linear mixed models. Zeger and Liang were among the leaders in developing successful modelling for these data. In a series of articles they develop a restricted maximum likelihood approach to the problem of estimating the model parameters and introduce a method called GEE an acronym for generalized estimating equations. The first edition of this book was very popular in the statistical community, particularly for statisticians working in the pharmaceutical industry. Along with Peter Diggle these three authors presented in the first edition this research organized into a single book for the first time. Now there is a plethora of books some primarily theoretical and others primarily applied. The issue of missing data is very common to this type of data particularly when the data come from a clinical trial. The research of Molenberghs and Verbeke, covered by them in some repeated measures books, has shown these models to be among the most useful for handling missing data in realistic ways. This second edition of this book has even greater coverage of topics and includes a fourth author Patrick Heagerty. Each of the four authors are skill research statisticians who specialize in biostatistics and particularly longitudinal data. While today there are many books to choose, this text continues to be among the best.

The first edition of Analysis for Longitudinal Data has become a classic. Describing the statistical models and methods for the analysis of longitudinal data, it covers both the underlying statistical theory of each method, and its application to a range of examples from the agricultural and biomedical sciences. The main topics discussed are design issues, exploratory methods of analysis, linear models for continuous data, general linear models for discrete data, and models and methods for handling data and missing values. Under each heading, worked examples are presented in parallel with the methodological development, and sufficient detail is given to enable the reader to reproduce the author's results using the data-sets as an appendix. This second edition, published for the first time in paperback, provides a thorough and expanded revision of this important text. It includes two new chapters; the first discusses fully parametric models for discrete repeated measures data, and the second explores statistical models for time-dependent predictors.

"The book is readable, well-written, and amply illustrated" --Technometrics, August 1995 (previous edition)"It belongs in the possession of every statistician who encounters longitudinal data." --Journal of the American Statistical Association". . . provides an excellent bridge between novel concepts in theoretical statistics and their potential use in applied research." --Statistics in Medicine"The topics covered are too numerous to dwell on here ... If your work involves longitudinal data and you wish to update, this book will serve you very well. As a quick look-up, it is very useful." --Pharmaceutical Statistics"The authors conclude each chapter with a helpful summary or conclusion, often indicating further reading. Helpfully, they also mention the topics that they have chosen not to present, together with other recommended books for you to follow up ... They have also chosen a good selection of examples, many of them medical, with which the various methods are clearly illustrated." --Pharmaceutical Statistics"Readers with interests across a wide spectrum of application areas will find the ideas relevant and interesting ... The book is readable and well written ... It belongs to the possession of every statistician who encounters longitudinal data." --Zentralblatt MATH

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