can be achieved through interdisciplinary team work. A number of solutions are provided that would steer current research and might result in breakthroughs.

Cancer prevention strategies cover factors such as smoking, obesity, diet, physical exercise and alcohol consumption, among others. The text covers more aspects of morbidity and mortality and modelling related to smoking relative to other risk factors. Some data tables could have been presented better as well as having appropriate references. There are also numerous typographical errors, though this should not discourage anyone from reading the text.

This really is a marvellous piece of work, which should provide scientists with key strategies that will lead to successful research outcomes and the much-needed ultimate breakthrough in cancer. There are some exceptional data tables, which can be handy for reference work. It is a very highly recommended text for any professional associated with the field of cancer.

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The Frailty Model
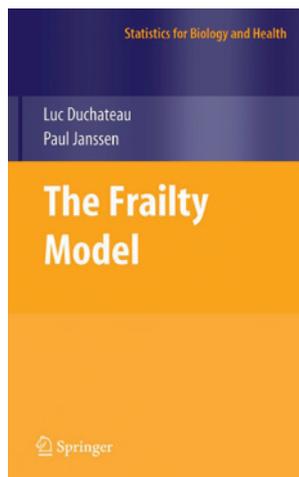
Frailty models are random effects models for survival data and may therefore be useful as a tool to model multivariate survival data, for example survival data from a number of independent clusters where a frailty shared between members of the same cluster gives rise to dependence of survival times within clusters. Frailty models may also be used for analysis of recurrent events ("serial" survival data) but most of the medical and veterinary examples introduced in Chapter 1 deal with "parallel" survival data.

As is the case for most other texts on frailty models, this book also puts most emphasis on the mathematically convenient gamma frailty model. Thus, Chapter 2 is devoted to parametric models with a gamma frailty and Chapter 5, on semi-parametric inference, also focuses on this frailty distribution (although there is a brief section on penalised likelihood with log-normal frailties). However, in Chapter 4 there is a useful discussion on the dependence structure imposed by different choices of frailty distributions with many details. Some guidance for the user on how to choose between distributions would have been nice but the authors, correctly, state this problem to be one where further research is needed.

Although the book concentrates on frailty models as a tool for analysing multivariate survival data, Chapter 3 briefly discusses alternative approaches. These include fixed effect models and marginal models. The former class of models seems to be of little use and some of the examples in the corresponding section are rather inadequate with estimates on the boundary on the parameter space and meaningless standard errors. Marginal models, however, provide a useful alternative to frailty models and some more detailed discussions on differences between marginal covariate effects and effects conditional on frailty would have been beneficial. The final Chapters, 6 and 7, treat a number of extensions including multi-level frailty models.

All in all, this is a highly recommendable text on a topic where few other books are available. The book that comes closest in coverage of frailty models is Hougaard's[1]. There are some major differences between those two texts: Hougaard's book gives a broader coverage of other aspects of survival analysis, including univariate models, multi-state models and recurrent events. Duchateau and Janssen's book concentrates on frailty models and provides more details, for example on fitting semi-parametric models and on the relationship between frailty models and so-called copula models.

Reference
1. Hougaard, P. (2000) *Analysis of Multivariate Survival Data*. New York: Springer.

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Statistical Models: Theory and Practice (revised edition)
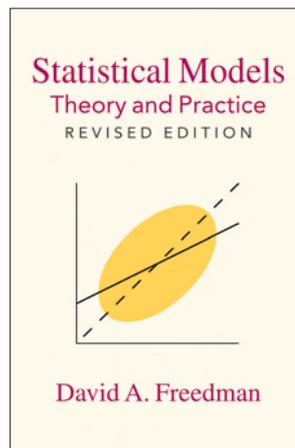
Is it possible to disentangle complex causal phenomena using statistical modelling? Is there—and will there ever be—a philosopher's stone able to turn association into causation? In this outstanding book on regression modelling of causal phenomena Dr Freedman shows that the increasingly common claims about the superiority of some quantitative methods to detect causality are based on the ignorance of the far-reaching assumptions behind them. The main message one takes home from *Statistical Models* is that "there is no mechanical algorithm for producing a set of 'assumption-free' facts or causal estimates based on those facts."

Chapter 1 is a simple but highly effective introduction to observational and experimental studies. This is the most appropriate way to start a book that deals with modelling of observational data. Chapters 2–5 are on simple and multiple linear regression and contain a detailed discussion of ordinary least squares and generalised least squares. In line with the spirit of the book, the emphasis is on the assumptions and limitations of these methods. Chapter 6 is the best discussion of path models that I have ever read and introduces the core concept of the book: the "response schedule". This concept, proposed by Neyman in 1930, "says how one variable would respond if you intervened and manipulated the other variables". Together with other assumptions, it is a theory of how the data were generated. If the theory is right causal effects can be estimated from observational data, if it is wrong causal inference is not possible. In other words, models assume—and do not prove—causation. Chapter 7 is a good introduction to maximum likelihood and Chapter 8 is an outstanding introduction to the use of bootstrap in regression modelling. Chapter 9 is on simultaneous equations and on their estimation by means of instrumental variables. It has an especially useful section on the invariance assumptions made by these and other modelling techniques. Chapter 10, the final one, is quite appropriately a methodological manifesto that conveys the main message of the book in a concise format and puts it into an historical perspective. The appendices contain some MATLAB code and four sociological papers that are used to illustrate the main concepts of the book.

This revised edition of an already outstanding book was completed by Dr Freedman shortly before his death in late 2008. Although *Statistical Models* was primarily written for undergraduate social scientists, I cannot imagine any researcher dealing with statistical modelling who could not benefit from reading this book.

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