Book Review

Statistics in Medicine

(wileyonlinelibrary.com) DOI: 10.1002/sim.6040 Published online in Wiley Online Library

Medical statistics in clinical and epidemiological research

Marit B. Veierød, Stian Lydersen and Petter Laake, Gyldendal Norsk Forlag, Oslo, 2012. No. of pages: 714. Price: 575 Norwegian Kroner. ISBN: 978-82-05-39959-4

Searching for the expression 'Medical Statistics' in Amazon.com produces more than 4000 titles, the vast majority introducing basic statistical concepts with the emphasis on medical or health related data. Hence, when I was asked to review 'Medical statistics in clinical and epidemiological research', it is not surprising that I anticipated ~~yet~~ another introductory book that, at most, could present some pedagogical novelty on how statistical concepts are presented to non-statisticians. I could not be more wrong. This book, edited by Marit B. Veierød, Stian Lydersen, and Petter Laake, offers an exciting and comprehensive list of advanced and modern statistical topics that are increasingly referred to in the health research literature

In the preface, the editors identified those 'interested in clinical and epidemiological research' as the target audience. However, in my opinion, the book seems most suited to health researchers with a strong quantitative background who are interested and ready to take the next step in terms of statistical methodology. It is also well suited to applied statisticians and statistical students who are seeking a brief theoretical introduction to the methods presented in the book. Finally, I think it can also be a valuable resource for instructors when preparing lectures on these topics.

The 714 pages are evenly divided into 20 chapters written by 29 internationally renowned experts. The comprehensive range of topics covered is both impressive and innovative. Although the chapters do not seem to follow any particular order, the first ones include classical modeling topics such as logistic, linear and Poisson regression, survival and longitudinal analysis, and latent and mixed models. The innovation comes in the following chapters with a modern choice of topics in medical statistics, such as causal inference, measurement error, bootstrapping, microarray data, attributable fractions, Bayesian methods, bootstrapping, missing data, and meta-analysis. Although most of the chapters can be read independently of the others, the editors' effort to maintain a similar notation and nomenclature across the book is clear. At the end of each chapter, there is a section on further reading, which includes other textbooks and/or scientific articles on the topic, for those who wish to deepen their knowledge.

All chapters provide a nicely structured overview of the methods and lay down the theoretical principles of their development and assumptions. This is generally supported with several illustrative and well-chosen real-world examples of their application and a detailed explanation conveying the main points.

Although the authors' effort to avoid being highly mathematical when presenting the methodology is evident, I believe there is nevertheless some room for improvement in a future edition through the simplification of notation and technical details. The formula for the generalized linear mixed model for three-level data (Section 9.3.2) is a good example of this.

The lack of software examples and implementation code may be considered as shortcoming of this book, especially given the target audience. Even though some chapters include a section about software, this could have been applied to all the chapters. A website containing the examples in text and the software code to reproduce them would be an excellent addition.

In summary, I am convinced that 'Medical statistics in clinical and epidemiological research' clearly has the potential to become a classical textbook in the field of Medical Statistics. I strongly recommend it to everyone with interest in modern statistical methods applied to the health sciences.

Statistics
in Medicine

ARMANDO TEIXEIRA-PINTO
Screening and Test Evaluation Program
Sydney School of Public Health
University of Sydney
Sydney, Australia