Book Reviews

Modern Medical Statistics: A Practical Guide. B. S. Everitt. London: Arnold, 2003. Pp. xiv + 236, £40.00. ISBN 0-340-80869-1.

Some of Professor Everitt's previous books are among my most thumbed, so I was glad of the opportunity to review this one. In general, I have not been disappointed. The target user is the medical researcher who is not a statistician. Since I am the latter as well as the former, I will concentrate on the more advanced topics, but, on the whole, this book should prove a lucid and practical guide.

The first chapter is a short run-through of the generalized linear model. Other gentle introductions to this topic are already available, but this one, as well as standing up in its own right, serves as a necessary grounding for the later chapters on longitudinal data, survival analysis, and generalized additive models. Of these three, the last may be the least familiar: it is a way of fitting curves which uses 'the data themselves to suggest the appropriate functional form'. All these topics are described with admirable conciseness, and important practical issues are discussed without oversimplification. I was glad, for example, of the comparison of marginal and conditional models, differences which even professionals may find rather subtle.

The author lists neural networks and data mining as two 'very obvious' omissions (p. ix), but I agree with him that these are not great losses. Of perhaps more regrettable omissions, I could only think of geostatistical methods. Regarding topics which were included, I remain sceptical of the utility of classification and regression trees. However, now that I understand the method far better, I hope a suitable problem will cross my path so I can put it to the test. There are also chapters on missing data, Bayesian methods, exact inference, and mixture models.

I found the structure of the book logical, apart from the long appendix on graphical methods, which I thought deserved a chapter by itself. It also contains an uncharacteristically obscure graph – a 3D scatter plot – which, like a similar one in the main text, induces an increasingly Zen-like state as one wills the floating circles to bond themselves to the axes. In the review copy, some of the later bubbleplots were almost invisibly faint. Nevertheless, I found some sections useful, for example the one on coplots, and, like the rest of the book, the appendix is to be commended on printing full datasets, even though some of these may already be familiar to some readers. The

index is not fully comprehensive. In general, however, this book should provide an accessible and useful introduction to the topics presented for infectious disease epidemiologists.

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Adaptive Dynamics of Infectious Diseases: In Pursuit of Virulence Management. Eds. U. Dieckmann, J. A. J. Metz, M. W. Sabelis and K. Sigmund. Cambridge: Cambridge University Press, 2002. Pp. 532, £50.00. ISBN 0-521-78165-5.

This volume is the second in the Cambridge Studies in Adaptive Dynamics series, which aims to introduce graduate students and researchers to a range of novel concepts and techniques for evolutionary and ecological research. *In Pursuit of Virulence Management* brings together various theoretical approaches to understanding the development and maintenance of virulence within pathogen populations. Concepts are discussed under broad section headings based on the key interactions considered: host population structure, within-host interactions, pathogen–host co-evolution and multilevel selection. This format provides a helpful framework, and also highlights the limitations of individual models in addressing only one or two issues at a time. In addition, the possible consequences of imposing extraneous interventions such as vaccines, drugs and other biological control agents are explored.

Particularly for those relatively unfamiliar with the area, this work is helpful in summarizing many of the current key concepts in the evolution of virulence. Early chapters provide a clear rationale for pursuing the questions developed in the text. Section introductions outline the ways in which the contributions of individual authors complement or contradict each other, providing an overall perspective. Contributors use a wide range of approaches and examples in discussing their subject matter, ensuring that readers from a number of disciplines will find aspects of relevance to their own area of study. Of most interest are those chapters which explore how well model predictions relate to observed population or experimental

data. Such comparisons allow the reader to draw conclusions about the strengths and weaknesses of different theoretical approaches, and highlight the importance of testing hypotheses on a small scale before drawing wider conclusions.

Models for exploring the possible unanticipated or adverse effects of interfering with natural selection through use of antibiotics and vaccines highlight some of the potential long-term problems with interventions designed for short-term gain. The final chapters draw together key issues of relevance to virulence management for researchers working in specific fields of biology. A well-constructed epilogue reminds the reader of the book's main objectives, and the overarching principles of relevance to virulence management which have been illustrated throughout a range of chapters. Perhaps most helpfully, an honest discussion of the current limitations of the field and implications for future directions in empirical and theoretical research are outlined.

As is inevitable given the number of contributors to the volume, the theoretical complexity of chapters varies greatly, making some more generally comprehensible than others. There is also variable discussion of pragmatic considerations which may contribute to variation in biological systems and hence limit the applications of models. For this reason, the book is best seen as a starting point for further study, and comprehensive references introduce a very extensive literature to facilitate this. In this way, the volume achieves its aims of being an introductory text for researchers to expand their range of knowledge and stimulate new enquiry.

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