

BOOK REVIEW

Epidemiology: Beyond the Basics

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When epidemiology began to assert its place as a significant scientific discipline in the mid-20th century, there were few texts to assist students or their teachers. Indeed, the methods and rigors of the discipline were just beginning to be defined and refined. Consequently, most teachers had to develop their own class notes and exercises. Over the next 2–3 decades, a number of “introductory” texts appeared, aimed largely at the needs of undergraduate students and those such as clinicians with an “amateur” or “beginner’s” interest in the subject. Other texts of interest to epidemiologists appeared that elaborated on the more technical aspects of certain related subjects, such as statistics and social sciences applied to medicine. There was little, however, to meet the needs of graduate students and their teachers and of career epidemiologists looking for a more detailed description of the increasingly sophisticated methodologies of their discipline. This book is designed to meet that need and, as such, will be widely welcomed.

The book is divided into five parts. Part I concentrates on the elements of epidemiologic study design, giving a clear account of conventional descriptive and analytical studies. This will serve as a helpful refresher for the advanced student, and it does so in an attractive style. Unusually, this book contains a useful explanation of the concepts of cohort analysis and the use of ecologic studies. Part II of the book is concerned with measures of disease occurrence and association. Chapter 2 deals first with measures of incidence and prevalence and the management of complex data sets, for example, when follow-up times for individual subjects vary. Chapter 3 is concerned with calculation of relative and attributable risk and rate ratios. Generally, the methods of calculation are clearly described, but I was mired down at times when textual descriptions were overtaken by mathematical formulae, for example, with the explanation of “cumulative incidence” on pages 59–64 and the calculation of Levin’s “population attributable risk” on pages 101–104. While there is clearly a place for introducing theoretical models and mathematical formulae in technical appendices, their incorporation into narrative text may bemuse rather than assist newcomers in understanding novel concepts and methods. I prefer to see narrative explanations illuminated with real-life examples rather than relying on sequential algebraic logic to convey concepts that many students find difficult on first encounter.

Parts III and IV are concerned with threats to validity and interpretation of results as well as how to deal with such threats. Two of the most important threats are bias and con-

founding, the management of which experienced epidemiologists will readily confess can pose huge difficulties. Therefore, the extensive space given to considering their causes, how to avoid them when possible, and how to adjust or allow for them when it is not possible to avoid them is amply justified. I found these chapters particularly helpful, for example, in categorizing the various types of bias and how they may arise and be avoided. Bias is defined as the result of systematic error, although validity can also be compromised by random or technical error. While the latter are referred to in a number of contexts, I was surprised that they were not identified in the index, particularly technical error, which, by definition, can usually be avoided if recognized. Confounding as a concept is easily described, but it is difficult to identify its mediators in practice and still more difficult to disentangle them from causes, especially when both causes and confounders are multiple. Yet, if valid conclusions are to be drawn, it is essential that this be done and appropriate adjustments be made. Another issue dealt with at some length is interaction between variables. Anyone who finds the conundrums posed by bias, confounding, and interaction hard to resolve will find these chapters helpful. The last chapter in Part IV deals with quality assurance and control. It focuses mainly on adjustment and multivariate analysis and does so in ample detail for the working epidemiologists. This is where most of us quite properly turn to our statistician colleagues to hold our hands. Complacency about our statistical abilities is usually misplaced, although we must understand enough to be able to communicate effectively with the statistician.

Part V briefly addresses issues relating to the communication of our results, an essential component of our responsibilities but too often treated too casually. Researchers who follow the advice in this chapter should escape this reproach and so earn the gratitude of their readers.

The book concludes with a set of five appendices outlining a few key statistical procedures.

A final critical comment: I was presented with nine pages listing no fewer than 36 errata, many of which were relatively trivial, but some were crucial. For example, in one place, for “case-control,” we should read “case-cohort”; in others, decimal points were wrongly placed or \pm signs were inverted, incorrect figure numbers were referenced, attributable risk was cited instead of rate ratio, and several formulae were incorrect. So many errors are surely unacceptable.

Overall, any reservations I have about this book are far outweighed by its merits. The text is clearly written, the

illustrations are well chosen, and the graphics are excellent. The scope is broad enough to serve the needs of most intermediate students and practicing research epidemiologists without being overburdensome and I am sure will be widely welcomed as a valuable adjunct to formal class teaching.

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