
Book Reviews

Antimicrobial Chemotherapy, 4th edn. Ed. D. Greenwood. Oxford University Press, 2000. Pp. 413. £29.95.

This new edition follows on in much the same style of earlier editions of this work but has been revised significantly to incorporate recent advances in the subject. The book comprises 33 chapters grouped in 5 parts dealing respectively with general properties of antimicrobial agents, laboratory testing of susceptibility, resistance and mechanisms, pharmacokinetics and general principles of use of antimicrobials, and treatment of infections. Part I gives an overview of antimicrobial agents classified according to mode of action against bacteria, protozoa and viruses. Descriptions of individual drugs are brief and focussed as greater detail is given in subsequent chapters dealing with assays of susceptibility or resistance mechanism. This is a weakness in the design of the volume as one needs to review a number of chapters to obtain a comprehensive view of an agent. However, this is a minor point that could only have been avoided by having specific chapters covering all aspects of an agent which would then not be dissimilar from a review article. The tables and figures are appropriate and complement the text well without undue repetition. Indeed, the standard of editing throughout is excellent. Clinicians should find the chapters dealing with the therapeutic uses of antimicrobials both succinct and readable and the accompanying tables setting out choices of agent in different syndromes will no doubt be photocopied and pasted into note books for reference. Research scientists on the other hand may bemoan the lack of detail and depth in the coverage of some basic topics but in doing so would mistake the purpose of book. It should find a place on the shelf of most clinical microbiologists and in the library it could equally be consulted by those cramming for examinations or the merely curious.

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Mathematical Epidemiology of Infectious Diseases. Eds. O. Diekmann and J. A. P. Heesterbeek. John Wiley & Sons Ltd, 2000. Pp. 250 (hb) £80; (pb) £39.95.

The basic reproduction number (R_0), defined as the average number of secondary infectious cases resulting from the introduction of a typical infectious case into a totally susceptible population, is arguably the most important factor determining the transmission dynamics of many pathogens. It determines both the initial trend in infection

incidence following the introduction of a pathogen into a population and the long-term persistence of the infection. It can also be difficult to estimate and much of the focus of this book is on the theory for calculating the R_0 for infections and its relationship to the ‘growth’ rate in the infection incidence and the ultimate proportion of individuals infected in the given population. The authors, Diekmann and Heesterbeek are well-suited to this topic and are particularly known for their work on developing rigorous methods for deriving the basic reproduction number for different settings.

The book is divided into three inter-related parts. The first part starts by introducing the basic theory underlying the persistence of an infection, by considering the simplest possible populations – those in which there is no immigration and births or deaths can be ignored – and concludes with a clear illumination of the theory underlying the cycles in infection incidence for immunizing infections. This also touches on the theory for predicting optimal pulse vaccinations and presents the logic for why, counter-intuitively, control by pulse vaccination appears to be independent of the time interval between vaccination campaigns under some circumstances. There has been much discussion in the literature of the critical population sizes required for the persistence of a given pathogen and the authors present recent and ongoing arguments that the time to ‘extinction’ of a pathogen is another important (but neglected) factor which should also be considered. Another highlight (albeit brief) of this part is a discussion of the criteria for whether or not a second pathogen introduced into a population persists and how this is influenced largely by the size of its R_0 relative to that of the pathogen already present.

The second part of the book elaborates on the first part, considering complex populations in which individuals can be aggregated into different strata eg according to age, time since infection. It starts with an introduction to the possible different strata, which the authors refer to as ‘p-states’, ‘h-states’, ‘i-states’ etc. (and which may appear abstract/offputting to some readers) and methods for the calculation of the basic reproduction number in such populations are presented. Besides dealing with the methods for incorporating age-dependent contact into models and for calculating the average age at infection (which should be familiar to many infectious disease epidemiologists), this part also describes pair-formation models (relevant for describing the transmission dynamics of STDs), the theory for the spatial spread of plant pathogens and the persistence

of macroparasites (eg. helminths). This part concludes by discussing contact between individuals, e.g. the possible ways in which the number of individuals contacted by each case increases with population size, and introduces readers to the relatively new area of network models.

The book is designed either for self-study or for group work as part of a course. As such, each chapter presents the theory interspersed with numerous exercises, designed to improve understanding; to benefit most from the book, readers will need to work through the exercises, or at least, through the solutions. The latter are particularly well-written and generously provided in part 3 and have different levels of difficulty, e.g. some requiring mathematics covered at undergraduate level, others requiring common sense and the majority requiring something in between the two extremes. The fact that the theory is elaborated in stages and developed through the exercises means that the book is not ideal for 'dipping into'. The main criticism of the book is that it is rather abstract in places and more examples relating the theory to practice for specific infections would have been welcome. That said, the book should be useful for applied mathematicians and modellers wishing to learn more about the theory underlying the dynamics and persistence of infections in different populations. Infectious disease epidemiologists will also benefit, though they will need to be willing to tolerate a fair amount of mathematical reasoning.

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Social Support Measurement and Intervention. Eds. S. Cohen, L. G. Underwood and B. H. Gottlieb. Oxford University Press, 2000. Pp. 345. £32.50.

While it has since long been recognized that intact social relationships are an important factor of health and well-being, much less is known about the mediators and pathways through which social support affects health. The explanatory models that have been put forward either postulate direct effects of social support on health, e.g. through networks providing tangible help, or indirect effects, through mitigating harmful responses to stressful life events.

This book addresses the need to disseminate state-of-the-art techniques for measuring psychosocial concepts and it is the second in a series on this topic which has been sponsored by the Fetzer institute. The authors give an overview on designing and assessing social support strategies and examine the processes through which social relationships might influence health. After an introductory section on the historical and theoretical perspectives of studying the links between social support and health, the book has two separate parts, on social support measures and on social support interventions.

The first part is most likely of interest to researchers who design studies involving the measurement of social support. It gives a detailed account of the different constructs and interpersonal processes involved in social support using diagrams to explain the more complex conceptual frame-

works. Measures of social integration and social networks are clearly presented at the beginning of this section, and followed by measures of relationship properties and interactions relevant to social support. It is well known that people's beliefs about their personal relationships, whether they feel cared for and loved, may matter more than the actual level of support received. Perceptions about the social support received are strongly linked to self-esteem and well-being and this relationship is specifically discussed in a chapter dedicated to perceived and received support. While all chapters of the book come with a comprehensive literature overview, this chapter has particularly useful subsections with references for specific health conditions and diseases.

Though the focus is very much on the US context, the second part is an excellent guide for making decisions on effective social support interventions. It is not only useful to researchers who design appropriate intervention strategies but also to clinicians, managers and social care workers who want to know more about the key guiding principles that should inform the design and management of social support interventions. It is interesting to learn that under circumstances, social support can even do more harm than good and that the success of social support strategies varies widely with the setting and approach taken. As with medical interventions, only few social support interventions have been critically evaluated and the authors point to these deficits by identifying clearly the knowledge gaps and areas for further research. With this comprehensive account of the topic the authors make a valuable contribution towards an evidence-based practice of social support management.

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Antibiotic Resistance, Methods and Protocols. Ed. S. H. Gillespie. Humana Press, 2001. ISBN 0 896 03777 0. Pp. 287. US\$89.50.

Antibiotic resistance is a subject that is occupying the thoughts of doctors, scientists, public health officials and even governments, and is likely to continue to do so for the foreseeable future. This book is therefore timely in its appearance. However, this being said, it should be stressed that the book's contents are clearly designed for those with a 'hands on' interest in the subject, rather than the general reader.

In addition to the obvious topic of the laboratory diagnosis of antibiotic resistance, the volume has sections addressing the clinically important areas of monitoring responses to treatment and the epidemiology of resistance. Other chapters deal with aspects of the biology of resistance such as multi-drug efflux pumps, the estimation of mutation rates and the detection of transposons. As with other volumes in this series, the chapters are generally written by established workers and each provides detailed experimental protocols, together with a notes section, where the authors list useful hints that comprise the tricks of their trade.

The methods provided in the various chapters are diverse. While molecular biology is strongly represented throughout

the book, other approaches including phenotypic methods for detecting glycopeptide resistance in *Staphylococcus aureus*, bacterial cell wall analysis, SDS-PAGE of outer membrane proteins, continuous culture and enzyme inhibition studies are also included. The value to the individual reader of including such a range of methods is difficult to gauge as it will ultimately depend on the corresponding diversity of interests of the said reader.

A minor criticism of the book is that the contents are (no doubt of necessity) focused on selected pathogens and

resistances, the former seemingly mirroring the research interests of the editor. Thus prospective readers with interests in specific areas of antibiotic resistance may be disappointed to find their pet subjects are not included. This aside, this book should be found on the library shelves, or better still the desks, of all departments where work on the genetics and mechanisms of antibiotic resistance is undertaken.

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