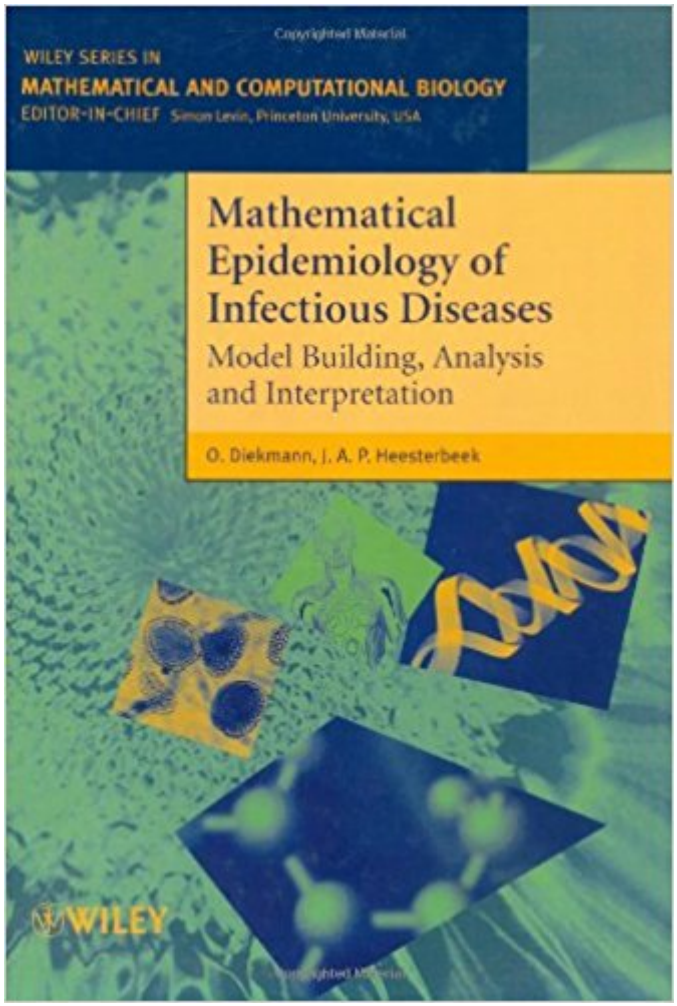
Mathematical Epidemiology Of Infectious Diseases: Model Building, Analysis And Interpretation



Synopsis

Mathematical Epidemiology of Infectious Diseases Model Building, Analysis and Interpretation O. Diekmann University of Utrecht, The Netherlands J. A. P. Heesterbeek Centre for Biometry Wageningen, The Netherlands The mathematical modelling of epidemics in populations is a vast and important area of study. It is about translating biological assumptions into mathematics, about mathematical analysis aided by interpretation and about obtaining insight into epidemic phenomena when translating mathematical results back into population biology. Model assumptions are formulated in terms of, usually stochastic, behaviour of individuals and then the resulting phenomena, at the population level, are unravelled. Conceptual clarity is attained, assumptions are stated clearly, hidden working hypotheses are attained and mechanistic links between different observables are exposed. Features: * Model construction, analysis and interpretation receive detailed attention * Uniquely covers both deterministic and stochastic viewpoints * Examples of applications given throughout * Extensive coverage of the latest research into the mathematical modelling of epidemics of infectious diseases * Provides a solid foundation of modelling skills The reader will learn to translate, model, analyse and interpret, with the help of the numerous exercises. In literally working through this text, the reader acquires modelling skills that are also valuable outside of epidemiology, certainly within population dynamics, but even beyond that. In addition, the reader receives training in mathematical argumentation. The text is aimed at applied mathematicians with an interest in population biology and epidemiology, at theoretical biologists and epidemiologists. Previous exposure to epidemic concepts is not required, as all background information is given. The book is primarily aimed at self-study and ideally suited for small discussion groups, or for use as a course text.

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Customer Reviews

"An excellent text, ideal for a postgraduate mathematical biology course. A clear exposition with emphasis on both intuition and rigorous mathematical development. It is a real tour de force - a mine of wisdom and intuition. The style has just the right level of informality and the way in which the main exposition is separated from the "elaborations" works extremely well.", Professor Valerie Isham, Head of Department, Department of Statistical Science, University College London, UK#

The mathematical modelling of epidemics in populations is a vast and important area of study. It is about translating biological assumptions into mathematics, about mathematical analysis aided by interpretation and about obtaining insight into epidemic phenomena when translating mathematical results back into population biology. Model assumptions are formulated in terms of, usually stochastic, behaviour of individuals and then the resulting phenomena, at the population level, are unravelled. Conceptual clarity is attained, assumptions are stated clearly, hidden working hypotheses are attained and mechanistic links between different observables are exposed. Features: * Model construction, analysis and interpretation receive detailed attention * Uniquely covers both deterministic and stochastic viewpoints * Examples of applications given throughout * Extensive coverage of the latest research into the mathematical modelling of epidemics of infectious diseases * Provides a solid foundation of modelling skills The reader will learn to translate, model, analyse and interpret, with the help of the numerous exercises. In literally working through this text, the reader acquires modelling skills that are also valuable outside of epidemiology, certainly within population dynamics, but even beyond that. In addition, the reader receives training in mathematical argumentation. The text is aimed at applied mathematicians with an interest in population biology and epidemiology, at theoretical biologists and epidemiologists. Previous exposure to epidemic concepts is not required, as all background information is given. The book is primarily aimed at self-study and ideally suited for small discussion groups, or for use as a course text.

Great book but unless you are a computational biologist with very advanced mathematical skills-don’t bother. This was over my head as a basic epidemiology student. I was searching for a book to elucidate R-zero...this was not it.

I purchased this book partially because one review proposed that this text would serve as a good, teach-yourself introduction to mathematical modeling of infectious disease (I.D.). I'm currently in a master's-level class on I.D. modeling which has no specific text requirement, and having only a so-so math background and little knowledge of model construction, I thought a self-teach book would be nice.Simply said, this book is not for those who stumbled through calculus 1. In fact, unless you're quite well-to-do in the math department, you'll find much of this text either very challenging or impenetrable. The worked-out problems are a very nice touch--one that many authors would do well to note--but the high-level math is too much for this budding epidemiologist.

This is a poorly thought and purposeless book. A modeler will find it to be a mumbo jumbo collection of elementary mathematical techniques not related to each other in a meaningful manner. On the other hand, a practitioner epidemiologist will find that the models presented in the book are merely a selection of toy examples having nothing to do with reality. Given the above, the price of the book is unreasonably high. If the book did not include several mathematical inaccuracies (solution existence conditions, asymptotics etc.), one could possibly use some of its model-examples in an introductory course of mathematical modeling, but unfortunately this is not the case here. Notice that there is a plethora of other books that are appropriate for this task and much-much cheaper.

Modern Epidemiology Hospital Epidemiology and Infection Control (HOSPITAL EPIDEMIOLOGY & INFECTION CONTROL (MAYHALL)) Epidemiology: with STUDENT CONSULT Online Access, 5e (Gordis, Epidemiology) Epidemiology For Public Health Practice (Friis, Epidemiology for Public Health Practice) Epidemiology E-Book (Gordis, Epidemiology) Applied Functional Analysis: Applications to Mathematical Physics (Applied Mathematical Sciences) (v. 108) The Wonderful World of Model Trains: A Beginner's Guide to Building Your Own Model Railways and Creating Stunning Sceneries & Layouts Model Building in Mathematical Programming Designing & Building Multi-Deck Model Railroads (Model Railroader)