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Titolo	Mathematical and Statistical Modeling for Emerging and Re-emerging Infectious Diseases // edited by Gerardo Chowell, James M. Hyman
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Descrizione fisica	1 online resource (IX, 356 p. 94 illus., 63 illus. in color.)
Disciplina	519.2
Soggetti	Probabilities Infectious diseases Statistics Epidemiology Probability Theory and Stochastic Processes Infectious Diseases Statistics for Life Sciences, Medicine, Health Sciences
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface -- A Reality of Its Own -- Modeling the Impact of Behavior Change on the Spread of Ebola -- A model for coupled outbreaks contained by behavior change -- Real-time assessment of the international spreading risk associated with the 2014 West African Ebola Outbreak -- Modeling the case of early detection of Ebola virus disease -- Modeling ring vaccination strategies to control Ebola virus disease epidemics -- Estimation of the number of sickbeds during Ebola epidemics using optimal control theory -- Inverse problems and Ebola virus disease using an age of infection model -- Assessing the Efficiency of Movement -- Restriction as a Control Strategy of Ebola -- Patch models of EVD transmission dynamics -- From bee species aggregation to models of disease avoidance: The \emph{Ben-Hur} effect} -- Designing Public Health Policies to Mitigate the Adverse Consequences of Rural-Urban Migration via Meta-Population Modeling -- Age of Infection Epidemic Models -- Optimal Control of Vaccination

in an Age-Structured Cholera Model -- A Multi-risk Model for Understanding the Spread of Chlamydia -- The 1997 Measles Outbreak in Metropolitan São Paulo, Brazil: Strategic Implications of Increasing Urbanization -- Methods to determine the end of an infectious disease epidemic: A short review -- Statistical considerations in infectious disease randomized controlled trials -- Epidemic models with and without mortality: when does it matter?- Capturing Household Transmission in Compartmental Models of Infectious Disease -- Bistable endemic states in a Susceptible-Infectious-Susceptible model with behavior-dependent Vaccination -- Index.

Sommario/riassunto

The contributions by epidemic modeling experts describe how mathematical models and statistical forecasting are created to capture the most important aspects of an emerging epidemic. Readers will discover a broad range of approaches to address questions, such as Can we control Ebola via ring vaccination strategies? How quickly should we detect Ebola cases to ensure epidemic control? What is the likelihood that an Ebola epidemic in West Africa leads to secondary outbreaks in other parts of the world? When does it matter to incorporate the role of disease-induced mortality on epidemic models? What is the role of behavior changes on Ebola dynamics? How can we better understand the control of cholera or Ebola using optimal control theory? How should a population be structured in order to mimic the transmission dynamics of diseases such as chlamydia, Ebola, or cholera? How can we objectively determine the end of an epidemic? How can we use metapopulation models to understand the role of movement restrictions and migration patterns on the spread of infectious diseases? How can we capture the impact of household transmission using compartmental epidemic models? How could behavior-dependent vaccination affect the dynamical outcomes of epidemic models? The derivation and analysis of the mathematical models addressing these questions provides a wide-ranging overview of the new approaches being created to better forecast and mitigate emerging epidemics. This book will be of interest to researchers in the field of mathematical epidemiology, as well as public health workers.
