TABLE OF CONTENTS

Foreword	VII
James W. Curran	
Acknowledgements	IX
Carlos Castillo-Chavez	
Introduction	
Statistical and Mathematical Approaches in HIV/AIDS Modeling: A Review Steven J. Schwager, Carlos Castillo-Chavez, and Herbert W. Hethcote	2
I. Statistical Methodology and Forecasting	
Epidemic Models, Empirical Studies, and Uncertainty	38
Predicting AIDS Incidence by Extrapolating from Recent Trends John M. Karon, Owen J. Devine, and W. Meade Morgan	58
II. Infectivity and the Human Immunodeficiency Virus (HIV)	
Measuring HIV Infectivity	80
The Stages of HIV Infection: Waiting Times and Infection Transmission Probabilities	111
Modeling Heterogeneity in Susceptibility and Infectivity for HIV Infection	138
On the Role of Variable Infectivity in the Dynamics of the Human Immunodeficiency Virus Epidemic	157



III. Heterogeneity and HIV Transmission Dynamics

Assessment of the Risk of HIV Spread Via Non-steady Heterosexual Partners in the U. S. Population	178
On the Role of Long Incubation Periods in the Dynamics of Acquired Immunodeficiency Syndrome (AIDS). Part 2: Multiple Group Models	200
Nonrandom Mixing Models of HIV Transmission	218
IV. Social Dynamics and AIDS	
The Structure and Context of Social Interactions and the Spread of HIV Lisa Sattenspiel	242
Pair Formation in Sexually-Transmitted Diseases	260
Roland Waldstätter	
Mixing Framework for Social/Sexual Behavior	275
Interaction, Pair Formation and Force of Infection Terms in Sexually Transmitted Diseases	289
Structured Mixing: Heterogeneous Mixing by the Definition of Activity Groups	301
Selective Contact within Structured Mixing with an Application to HIV Transmission Risk from Oral and Anal Sex	316
V. The Immune System and the HIV	
Modeling the Interaction of the Immune System with HIV	350
Modeling the Interaction of HIV with Cells of the Immune System	371
When HIV meets the Immune System: Network Theory, Alloimmunity, Autoimmunity, and AIDS	386