INFECTIONOUS DISEASE EPIDEMIOLOGY
Theory and Practice

THIRD EDITION

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# Contents

Contributors xiii
Preface to the Third Edition xvii

## PART 1—METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY 1

### Chapter 1 Early History of Infectious Disease: Epidemiology and Control of Infectious Diseases 3
Kenrad E. Nelson and Carolyn Masters Williams

| Introduction | 3 |
| The Era of Plagues | 3 |
| Early Epidemiology | 4 |
| The Observation and Care of Patients | 6 |
| The Development of Statistics and Surveillance | 7 |
| The Discovery of Microorganisms | 8 |
| The Twentieth Century | 12 |
| What Lies Ahead | 13 |
| The Infectious Diseases Challenge | 15 |
| References | 16 |

### Chapter 2 Epidemiology of Infectious Disease: General Principles 19
Kenrad E. Nelson

| Introduction | 19 |
| The Classification of Infectious Diseases | 19 |
| Epidemiologic Characteristics of Infectious Diseases | 25 |
| Surveillance of Infectious Diseases | 33 |
| Temporal Trends of Infectious Diseases | 33 |
| Recent Trends in Infectious Disease Morbidity and Mortality in the United States | 40 |
| Recent Worldwide Trends in Infectious Disease Morbidity and Mortality | 40 |
| References | 42 |
Chapter 7  Geographic Information Systems  167
Gregory E. Glass
Overview  170
Application Examples  173
Conclusion  184
References  185

Chapter 8  Microbiology Tools for the Epidemiologist  187
Nicole M. Parrish and Stefan Riedel
Taxonomy, Classification, and Structure of Infectious Agents  188
Viruses  189
Bacteria  191
Fungi  198
Medical Parasitology  204
Diagnostic Microbiology  210
References  218

Chapter 9  Molecular Epidemiology and Infectious Diseases  219
Susan M. Harrington, John S. Francis, William R. Bishai, and Karen C. Carroll
Application of Typing Techniques  219
Definitions and Background  220
Molecular Biology Tools Available to the Molecular Epidemiologist  223
Specific Techniques of Molecular Epidemiology  229
New Methodologies  243
Conclusion  245
References  245

Chapter 10  The Immune System and Host Defense Against Infections  253
Joseph B. Margolick, Richard B. Markham, and Alan L. Scott
Introduction  253
Recognition of Pathogens  255
After Antigen Binding: Immune Activation  259
Dealing with the Pathogen: Immune Effector Mechanisms  259
Cytokines of the Innate and Adaptive Immune Systems  262
The Role of Cytokine Expression in Defining Functionally Different
  Effector CD4 T-Cell Lineages  265
Mucosal Immunity  265
Respiratory Immune Environment  267
Common Mucosal Immune System  267
Tolerance and the Regulation of the Immune Response  267
Selective Immune Deficiencies: Windows into the Normal Roles
  and Functions of the Immune System  267
Conclusion  269
Recommended Textbooks of Immunology  269
References  270
Chapter 11  Vaccines: Past, Present, and Future  273
Anita M. Loughlin and Steffanie A. Strathdee

Introduction  273
Active Versus Passive Immunization  274
Types of Vaccines  274
Immunization Schedules  280
Vaccine Development  282
Vaccine Efficacy and Vaccine Effectiveness  284
Epidemiologic Studies  286
Monitoring Adverse Events and Vaccine Safety  288
Direct Impact of Vaccination  290
The Role of Vaccines in Eradication of Specific Diseases  295
Barriers to Vaccine Implementation and Coverage  299
References  300

Chapter 12  Nutrition and Infection  305
Alice M. Tang, Ellen Smit, and Richard D. Semba

Introduction  305
The Effects of Infection on Nutritional Status  305
The Effects of Malnutrition on Host Defense Mechanisms  306
Malnutrition and Specific Infectious Diseases  306
Micronutrients and Immunity to Infectious Diseases  308
Assessment of Nutritional Status  312
Conclusion  318
References  318

Chapter 13  Emerging and New Infectious Diseases  329
Kenrad E. Nelson

Responses to the Threat of Emerging Infections  329
Factors in the Emergence of Infectious Diseases  330
Notable Emerging Infectious Diseases  346
Newly Discovered Pathogens  359
References  360

Chapter 14  Healthcare-Associated Infections  369
Leilani Paitoonpong, Chuan Kwan Bonnie Wong, and Trish M. Perl

Introduction  369
The Magnitude of Problem of HAIs  370
History  371
Surveillance for HAIs  373
Pathophysiology and Risk Factors  377
Etiology and Transmission  379
Major Types of HAIs  380
PART 2—AIRBORNE TRANSMISSION  465

Chapter 15  Epidemiology and Prevention of Influenza  467
Mark C. Steinhoff

Introduction  467
Clinical Features of Influenza  467
Transmission  467
Diagnosis  468
The Virus  468
Nomenclature  469
Epidemiology of Epidemics and Pandemics  469
Influenza in Tropical and Subtropical Regions  472
Mechanisms of Antigenic Variation  474
Epizootic Infections and Evolutionary History  476
Prevention Strategies and Treatment  477
Pandemic 2009 H1N1 Virus  480
Avian Influenza Virus  481
References  482

Chapter 16  Measles  485
William J. Moss and Martin O. Ota

Introduction  485
Disease Burden  485
Biologic Characteristics  487
of the Measles Virus
Pathogenesis  488
Laboratory Diagnosis of Measles  491
Epidemiologic Characteristics  491
Geographic Distribution  492
Population Size and Measles Virus Transmission  492
Measles Mortality and Case Fatality  494
Measles Vaccines  495
Measles Control, Elimination, and Eradication  497
Conclusion  503
Acknowledgments  503
References  503
Chapter 17  Global Epidemiology of Meningococcal Infections  509
Mark C. Steinhoff and Kenrad E. Nelson

Introduction 509
The Organism 509
Acquisition and Carriage 510
Disease 510
Treatment 510
Risk Factors 511
Epidemiology 511
The Meningococcal Belt 513
Vaccines 514
Vaccine Strategies 516
References 517
For Further Reading 521

Chapter 18  Tuberculosis  523
Jonathan E. Golub, Jacqueline S. Coberly, and Richard E. Chaisson

Introduction 523
The Organism 524
History 527
Clinical Manifestations 528
Diagnosis 528
Therapy 532
Epidemiology: Global Prevalence and Incidence 533
Natural History of Tuberculosis 536
Mechanism of Transmission 537
Risk Factors Associated with Infection 538
Risk Factors Associated with Development of Disease 538
Bacillus Calmette-Guérin 545
Tuberculosis Control Strategies: Case Finding and Treatment 547
Conclusion 550
References 551

Chapter 19  The Epidemiology of Acute Respiratory Infections  561
Kenrad E. Nelson and Mark C. Steinhoff

Introduction 561
Impact on Public Health 561
Classification of Acute Respiratory Infections 567
Pathogens Responsible for Acute Respiratory Infections 569
Risk Factors 573
Efficient Methods of Data Collection to Evaluate Respiratory Epidemiology 585
Prevention of Respiratory Infections 587
Summary 593
References 595
PART 3—ORAL TRANSMISSION OF INFECTION  611

Chapter 20  Diarrheal Diseases  613
Robert E. Black, Christa L. Fischer Walker, and Claudio F. Lanata

Introduction  613
General Epidemiology Definitions  613
Sources of Data  614
Incidence  614
Impact of Diarrhea  616
Microbial Etiologies  617
Transmission Routes  623
Host Risk Factors  625
Antimicrobial Resistance  626
Strategies for Control  626
References  627

Chapter 21  Transmissible Spongiform Encephalopathies  635
Kenrad E. Nelson

Introduction  635
Scrapie  635
Kuru  636
Creutzfeldt-Jakob Disease  637
Chronic Wasting Disease of Mule Deer and Elk  645
References  646

PART 4—BLOOD AND BODY FLUID AS A RESERVOIR OF INFECTIOUS DISEASES  649

Chapter 22  Human Immunodeficiency Virus Infections and the Acquired Immunodeficiency Syndrome  651
Kenrad E. Nelson and David D. Celentano

Introduction  651
The AIDS Pandemic  652
The HIV Virus  652
HIV Natural History  654
AIDS-Related Opportunistic Infections  657
Host Factors in Susceptibility or Resistance to HIV Infection and Disease Progression  659
Inflammation and Microbial Translocation  662
HIV Genotypes  662
Impact of Coinfections on HIV  663
Antiretroviral Therapy  666
Modes of Transmission and Risk Factors  673
Global Prevalence of HIV  682
PART 5—VECTOR-BORNE AND PARASITE DISEASES  823

Chapter 25  Emerging Vector-Borne Diseases  825
Kenrad E. Nelson

Introduction  825
Arthropod-Borne Virus Infections  825
Flaviviruses 826
Dengue and Other Mosquito-Borne Infections 826
West Nile Virus in North America  831
Japanese Encephalitis Virus  841
Yellow Fever  843
Chikungunya Virus  845
Tick-Borne Encephalitis Virus  846
Other Mosquito-Borne Encephalitis Viruses in North America  846
Other Tick-Borne Infections  852
Trypanosomiasis  853
Rift Valley Fever  855
Summary  855
References  855

Chapter 26  Lyme Disease  861
Diane E. Griffin

Introduction  861
Clinical Picture and Biological Information  862
Clinical Manifestations  866
Diagnosis  868
Treatment  868
Epidemiology  868
Exposure/Risk Factors  871
Control Measures  871
Vaccine  872
Conclusions  872
References  873

Chapter 27  The Epidemiology and Control of Malaria  881
William J. Moss and Richard H. Morrow

Background, History, and Public Health Importance  881
The Biology of Malaria Parasites and Anopheline Vectors  884
Malaria Metrics  888
Pathogenesis in Individual Humans  890
The Diversity of Falciparum Malaria Disease  892
Human Activities, Climate Change with Global Warming, and the Epidemiology of Malaria  896
Chapter 28  Epidemiology of Helminth Infections  917
Clive J. Shiff

Introduction  917
Hookworm Parasites of Humans  917
Schistosome Parasites in Humans  920
Other Geohelminths  925
Control of Neglected Tropical Diseases  928
References  928

INDEX  931
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Preface to the Third Edition

Although the second edition of this book was published only 5 years ago, it is apparent that another edition is needed to keep pace with important recent advances in epidemiology and the prevention of infectious diseases. The chapters in the third edition have been revised to reflect current knowledge, concepts, and approaches to understand and investigate the epidemiology of infectious diseases so as to develop effective prevention strategies.

• Among the recent beneficial changes to preventing many important infectious diseases is the recent focus of attention on global health by academic institutions, international funding agencies, governmental organizations, and nongovernmental organizations (NGOs). The global pandemics of severe acute respiratory syndrome (SARS), influenza, human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), tuberculosis, and other infectious diseases have taught us once again that infectious diseases do not respect borders, socioeconomic classes, or geopolitical divisions. Nevertheless, as a result of the refoocusing of these scientific efforts and financial commitments, millions of lives have been saved. There is now talk of eventually ending the HIV/AIDS pandemic in the next 40–50 years and shrinking the region where malaria is endemic. One very important victory over a recurring infectious disease was the control of meningitis epidemics in the African meningitis belt with the development and massive deployment of an effective meningococcal type A vaccine to millions of persons in the target population in central Africa, thereby averting the tragedy so often associated with this disease in the past.

• Despite these important successes, new infectious disease challenges have continued to emerge and some chronic infectious disease problems have become more serious. During the last 5 years, ongoing problems with antibiotic-resistant pathogens have become more serious. We are now confronted with the specter of multidrug-resistant (MDR) tuberculosis and extremely resistant (X-DR) strains of Mycobacterium tuberculosis. Methicillin-resistant Staphylococcus aureus (MRSA) infections have become a major health issue, and the distinction between hospital/healthcare-associated and community-associated strains has become blurred. Emerging resistance to multiple available antibiotics has complicated the effective treatment of Neisseria gonorrhoea infections. Moreover, although the arsenal of effective antiretroviral drugs and drug combinations to treat HIV has grown impressively, inadequate adherence to therapy after patients’ symptoms are controlled has led to treatment failure and the emergence of resistant viruses among many patients. The concepts of “treatment as prevention” and prophylactic treatment (PREP) to prevent infection are important new strategies that have emerged in the past few years as a means to control the spread of HIV infections. Unfortunately, the effectiveness of PREP, as well as vaginal microbicides to prevent HIV transmission, has often been seriously compromised by poor adherence to the drug regimens. Although an HIV/AIDS vaccine remains a hope, an effective vaccine that will provide meaningful long-term protection is not likely to be launched in the foreseeable future. Therefore, many challenges remain for the control of existing and emerging infectious diseases.

• The chapters in this text have all been updated since the second edition, and many have been completely rewritten. We have also added a new chapter, which reviews the methods and principles of the prevention of infections acquired by various means, including contact, foodborne, vector-borne, and airborne routes of transmission. We believe this critical review of prevention strategies is a valuable addition to the book.

• The HIV/AIDS chapter reviews and evaluates the global epidemiology of HIV. In addition, it assesses the many prevention trials that have been published in the last few years.

Preface to the Third Edition
xviii  PREFACE TO THE THIRD EDITION

- The chapter on hepatitis has been updated to include recently published information on the genetic polymorphisms affecting host susceptibility to hepatitis C virus infection and the virus’s natural history. In addition, new information on the natural history, reservoirs, and risks factors for infection with the other four human hepatitis viruses (A, B, D, E) has been included in this chapter.

- The chapter on emerging infectious disease has been updated to include several newly recognized infections. The chapter on infectious disease dynamics has been rewritten and expanded to include methods of modeling the dynamics of infectious disease transmission in populations where various scenarios for transmission, natural history, and immunity prevail. The use and importance of mathematical models has increased in recent years as epidemiologists have sought to better understand infectious disease dynamics. Models are now commonly employed to estimate the potential efficacy and possible consequences of a prevention strategy or the consequences of delaying the age of infection with a specific pathogen. We believe it is important for infectious disease specialists and students to understand the interpretation and use of various models to describe the dynamics of an infection in a population.

We hope that those individuals who read and use our text will find it useful and informative. We enjoyed and learned from the process of reviewing and analyzing the mass of relevant information to assemble this book. We continue to find the pursuits of research and application of infectious disease epidemiology to be very exciting, rewarding, and important.