Applied Epidemiology

Theory to Practice

Edited by
ROSS C. BROWNSON
DIANA B. PETITTI

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Foreword

In 1949, the Epidemiology Section of the American Public Health Association celebrated its twentieth anniversary in a session on “The History of American Epidemiology.” John Gordon, chairman of the Department of Epidemiology at the Harvard University School of Public Health, spoke on “The Future in Epidemiology.” He defined the province and promise of epidemiology in succinct and comprehensive terms:

As the diagnostic discipline of public health, epidemiology should find increasing usefulness in the definition of health problems, in determining principles to guide programs for control, and in evaluation of accomplishment. The promise of a more scientific and a more statesmanlike public health has a close relationship with operational epidemiology.*

More than 30 years later, in an article on “Epidemiology and the Public Health Movement: A Historical Perspective,” Abraham and David Lilienfeld noted that:

During the past two decades, the discipline of epidemiology has become increasingly divorced from those activities in the real world that result in the improvement of public health. Public health administration was at one time intimately associated with epidemiology. . . . Our excursions in the historical development of epidemiology have led us to realize that epidemiology is closely interwoven with the public health movement, and our study of the evolution of the public health movement has indicated that its roots must be firmly implanted in an epidemiologic base. In order to continue with the past successes of both movements, they must be constantly nourished by each other.†

The great need for a textbook that teaches epidemiology as “the diagnostic discipline of public health,” a textbook that is concerned with “usefulness in the definition of health problems, with determining principles to guide programs for control, and with evaluation of accomplishment,” becomes abundantly clear when one reviews the content of leading textbooks in the field.

For example, the third (1994) edition of *Foundations of Epidemiology*, revised by David Lilienfeld and Paul Stolley, resembles its previous editions in that it provides practically no discussion of the use of epidemiology in public health practice. On the other hand, as the authors state, “a new chapter on the use of epidemiologic information in clinical settings has been added to this edition.” The new chapter has two sections: (1) Clinical Decision Making and (2) Reading and Interpreting Scientific Literature.

In sharp contrast, *Applied Epidemiology: Theory to Practice* considers epidemiology to be, as John Gordon said, “the diagnostic discipline of public health.” Its 12 chapters provide a thorough and comprehensive analysis of problems, issues, and methods, and describes the advantages and disadvantages of various alternative approaches. In addition, the case studies of actual programs which conclude each chapter emphasize the authors’ orientation to the real world of public health practice.

*Applied Epidemiology: Theory to Practice* is the book that the public health movement has been waiting for. It will be treasured by every public health worker who needs state-of-the-art information and guidance in defining health problems and attempting to solve them. It needs to be studied by policy-makers in all levels of government, in the schools of public health, and in the state and national public health associations. There has been no recognition of the crucial need for a large-scale program of federal aid to remedy the severe shortage of trained epidemiologists in state and local health departments, and to finance the development of a truly adequate information system that will provide health departments with the data required for effective planning and monitoring of programs and services. Commitment and leadership by the public health movement are essential to convince federal administrators and the Congress of the rich promise of epidemiology so clearly demonstrated by this landmark volume.

Milton Terris, MD, MPH
These are exciting times for epidemiology. Because of the increasingly large demand for epidemiologic expertise and the many advances in epidemiologic methods, both the opportunities and challenges in this field have never been greater. The advances in epidemiologic methods afford more sophisticated ways to evaluate the health risks associated with many exposures and with environmental contaminants in modern society. New information technologies, including powerful microcomputers, software, and the Internet, offer exciting opportunities for the conduct of a broader array of studies. Changes in how health care is delivered, particularly the growth of organized systems of care, open new chances for epidemiologists to become involved in population-based medicine and the assessment of health care utilization and quality. Despite the vast potential of epidemiology, decisions are frequently made and policy is often formed in the absence of sound epidemiologic data and scientific reasoning.

The need for this book became clear as a result of the authors' day-to-day work in public health and health care, experiences in the classroom, and discussions with colleagues. Individual epidemiologists and several expert advisory bodies have called for stronger links between educational institutions and public health practice: One link may include a curriculum in epidemiology that more closely reflects the day-to-day practice of public health.

In our view, applied epidemiology synthesizes and applies the results of etiologic studies to set priorities for intervention; it evaluates public health interventions and policies; it measures the quality and outcome of medical care; and it effectively communicates epidemiologic findings to health professionals and the public. Within this broad framework, the chapters in this book were chosen to emphasize some of the areas of public health practice in which systematic application of epidemiologic methods can have a large and positive impact. A major goal is to extend the scope of more traditional epidemiology books that tend to focus only on methods for determining disease etiology (e.g., study design, sources of bias, causal reasoning).

Following an introductory chapter, three overview chapters deal with study design and interpretation, methods in outbreak and cluster investiga-
tions, and principles of public health surveillance. The remaining eight chapters cover important contemporary topics that have strong conceptual or methodologic linkages with epidemiology. The chapters are designed to highlight key issues and to provide practical recommendations. Case studies at the end of each chapter illustrate major points and provide a basis for teaching exercises. Each case study follows a standard format (i.e., background, key questions, and implications for practice).

Topics covered in this book underline the multidisciplinary nature of epidemiology. Even within the overall science of epidemiology, there are a number of subdisciplines, such as clinical epidemiology, behavioral epidemiology, occupational epidemiology, chronic disease epidemiology, infectious disease epidemiology, and environmental epidemiology. In this regard, our book is intended to complement other recent Oxford texts in epidemiology and biostatistics.

The target audience for this text includes practicing epidemiologists, students in epidemiology, and practitioners and students in related disciplines that rely heavily on epidemiologic methods and reasoning. We hope the book will be useful in academic institutions, state and local health agencies, federal agencies with significant training missions, and health care organizations. Although the book is intended primarily for a North American audience, examples are drawn from all parts of the world and we believe that much of the information will be applicable in any developed or developing country. If used in course work, the students should already be familiar with the basic concepts in epidemiology.

Epidemiologic reasoning and methods inevitably will move beyond the boundaries of etiologic research and become integral to the practice of public health and the delivery of health care. We believe this book will be a useful resource.

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R. C. B.

D. B. P.
We are grateful to have chapters contributed by some of the top researchers and practitioners in the fields of epidemiology and public health: Andy Amster, Thomas A. Burke, Jennifer L. Kelsey, Abby C. King, Thomas D. Koepsell, Patrick L. Remington, Jonathan M. Samet, Donna F. Stroup, Steven M. Teutsch, Stephen B. Thacker, and Benedict I. Truman.


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