

INVESTIGATING DISEASE PATTERNS
The Science of Epidemiology

PAUL D. STOLLEY
TAMAR LASKY



Investigating Disease Patterns

THE SCIENCE OF EPIDEMIOLOGY

by Paul D. Stolley and
Tamar Lasky

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REVIEWED BY GRAHAM COLDITZ

Associate Professor of Medicine
Harvard Medical School
Boston, Massachusetts 02115

This outstanding book summarizes a broad range of epidemiologic material, carrying the reader from the simplest techniques of investigative inquiry to the complexities of evaluating the performance of screening tests. Paul Stolley and Tamar Lasky trace the history of epidemics from the Black Death to modern epidemics such as Lyme disease and cancer in adolescent girls due to *in utero* exposure to diethylstilbesterol (DES). Thus, in the opening pages they set the framework of this book, which covers applications of epidemiology from before its recognition as a discipline to the broad range of modern applications.

Tracing the beginning of epidemiology, the authors recount the evolution of epidemiologic thinking including theories about the transmission of diseases by different routes (sexual transmission, fecal-oral transmission, and, for cholera, transmission along the travel routes from

India through the Middle East to Germany and then Britain) the interruption of cholera deaths in London by removal of a Broad Street pump handle — all before the biology and responsible organisms had been identified. This example typifies an underlying truth in public health: that we can implement prevention long before the biology of observed relations is fully understood. In fact, too often we focus on the biology and delay implementation of changes that can save large numbers from unnecessary or premature death.

The book concludes with chapters addressing several contemporary applications of epidemiology. One chapter considers the evaluation of screening; defining sensitivity, specificity and positive predictive value of tests; and the importance of weighing risk and benefits of screening programs. Another addresses the role of epidemiology in evaluating what works in health services, noting that, with ever-increasing costs of technology, rigorous evaluations are urgently needed, and epidemiology has the techniques for such evaluations, provided the public demand is sufficient to justify the undertaking.

The future of disease and epidemiology is the focus of the closing chapter. Topics covered include the health hazards of societal stress and the application of molecular biology to epidemiologic investigations. Unfortunately, Stolley and Lasky do not confront the shortcomings of the epidemiologic approach to understanding the root causes of the disease burden that we carry in the United States at the close of the 20th century. This disappointing omission from the book contrasts with the rich history and successes of epidemiology that are so succinctly summarized and presented for a reader with no prior knowledge of public health or epidemiologic methods.

The shortcoming of epidemiology over the past 15 years has been the emphasis placed on the investigation of relations and disease mechanisms remote from public health and clinical medicine — a direct contrast with the anecdotes that open this book and illustrate how major public health advances have been made without knowledge of either organisms or underlying biologic mechanisms. Epidemiologists have ignored important areas, such as social class, which have been difficult to conceptualize and measure in the United States. In so doing, the discipline has become remote from issues

germane to the prevention of major illnesses that burden the US health care system, placing excessive emphasis on mechanisms of disease and the aetiology of minor or insignificant health problems.

Many a reader who has never stopped to hear the history of public health will be fascinated by the power of the tales in this book. A wonderful collection of history, both written and pictorial, captures the success of many public health endeavors. In addition, through a chapter on lung cancer we learn of the evolution of epidemiologic methods as public health moved away from infectious disease to unravel the causes of modern epidemics — cancer and heart disease. The application of epidemiologic methods to chronic diseases required new approaches to interpreting data, which are also set forth in this chapter. The conditions necessary to draw powerful conclusions from a collection of studies that address a common relation, such as that between smoking cigarettes and lung cancer, are summarized. Through chapters such as this, readers will gain insight into the richness of the discipline and its evolution as a cornerstone of public health research and prevention policy.

This clearly written book should be read by all physicians, public health trainees, and those interested in the role of scientific inquiry in public health and the protection of our society against harmful agents in the work place and the general environment as well as the role of drugs and tests within the health care system.

Nota Breve

Nature Medicine has chosen to review *Genes and the Biology of Cancer*; *Aging: A Natural History*; and *Investigating Disease Patterns: The Science of Epidemiology* from the Scientific American Library of W.H. Freeman & Company. These three books are representatives from the Health/Life Sciences division of the collection. The library offers titles in many fields including; Archaeology/Anthropology, Chemistry, Mathematics, Physics and Psychology. The books reflect a strong commitment on the part of the editors and authors to produce a collection of books that are timeless in their scientific integrity as well as accessible to both professionals and lay people. New books are published approximately every other month and can be purchased for \$32.95.