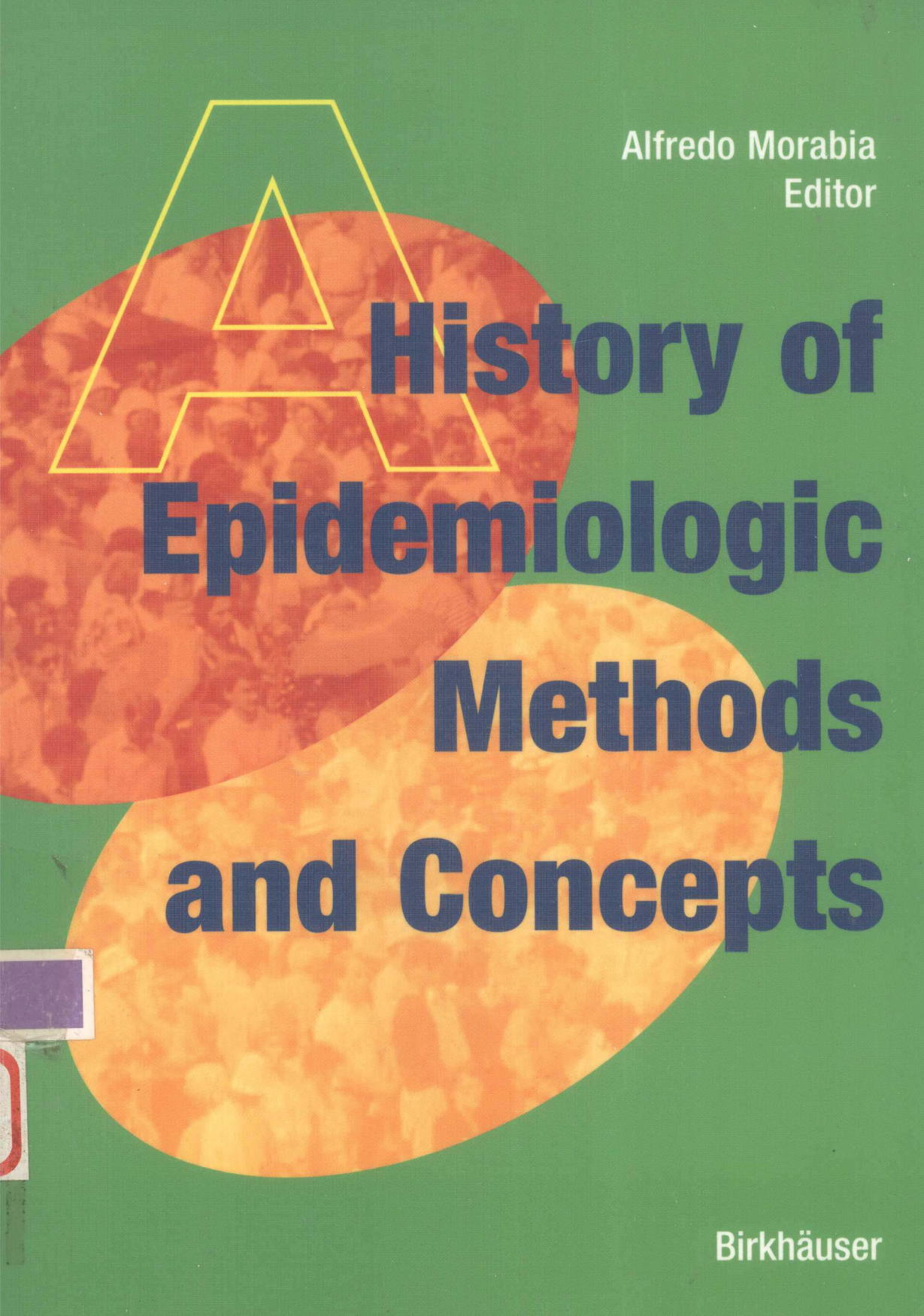


Alfredo Morabia
Editor



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Preface

Alfredo Morabia

The Annecy workshop

This book has two parts. The first part presents the evolution of epidemiologic methods and concepts. It serves as introduction and synthesis to the second part which is a collection of papers originally published in *Social and Preventive Medicine (International Journal of Public Health)*. Most of these papers had been presented at a Workshop on the history of epidemiology entitled “Measuring our scourges”, held in Annecy, France, on July 1–10 1996 and organized by the Wellcome Foundation and the Louis Jeantet Institute for the History of Medicine. The workshop focused on the historical emergence of the corpus of epidemiologic methods and concepts used today. A stimulating aspect of the workshop was the interaction between professional historians (William Bynum, John Eyler, Bernardino Fantini, Anne Hardy), who are world experts on Victorian and early 20th century epidemiology, and epidemiologists vested into the history of their discipline (Richard Doll, David Morens, Steven Stellman, Milton Terris, Jan Vandenbroucke, Paolo Vineis, Ernst L. Wynder and myself). Richard Doll, Ernst Wynder, Steven Stellman and Milton Terris have been prominent actors of the historical events we discussed. The other speakers were Luc Raymond, André Rougemont, Italo Scardovi and Jeanne Stellman. Four papers (on the history of cohort analysis, case-control studies, cancer registries and evolution of concepts and methods in textbooks) were written after the conference. The re-publication of the article of William Farr “On Prognosis” and its discussion by several scholars is also posterior to the Annecy workshop and was suggested by Gerry B. Hill. All papers have been available after publication on the website www.epidemiology.ch, choose history.

My introductory essay tries to synthesize the content of all these papers. I refer to the papers whenever possible, but this synthesis only reflects my personal view, just as each paper in part 2 expresses the views of its authors and not necessarily beyond.

What this book is and what it is not

This book retrieves the work of past scientists who in retrospect can be defined as epidemiologists and describe its evolution. This does not suffice to produce a historical analysis. Historians of science are able to integrate this analysis into its wider social, economical and political contexts, the general movement of science and of its ideas. But the history of epidemiology, and especially the history of its methods and

concepts, is still in its infancy. We cannot rule out that historians who will dig more deeply into certain parts of this history will gather a mass of new facts that will substantially modify our vision of the whole. A striking example of such possibility is related to the use of quantified group comparisons in clinical research. We used to consider the work of Pierre Louis, in France, who promoted the comparison of groups of patients to evaluate the efficacy of treatment, as an exception in a medical world dominated by individual thinking and case series (Morabia, 1996). But when Ulrich Troehler, Professor of History of Medicine at the University of Freiburg im Breisgau, searched into the practice of medicine in 18th century England, he found that there had been dozens of examples, analogous to that of Louis, of group comparisons in clinical settings. Moreover, the physicians who conducted these analyses resembled Louis in that they usually were marginal to the medical establishment, but used quantitative analyses to distinguish themselves from ordinary physicians (Troehler, 2000, p. 119–120).

The challenging objective of writing a history of epidemiologic methods and concepts requires strong interdisciplinary collaborations between epidemiologists, because of their deep understanding of the matter, and historians, because of the breadth of their perspective. The present book is a step in that direction. In the future, the collaboration will hopefully go beyond the mere exchange of experiences, papers and visions that we did at the Annecy Workshop.

This book is not historical in another aspect. The work of past epidemiologists is revisited with a modern perspective. Data are sometimes re-analyzed and their results interpreted using concepts that may not have formally existed then. These “presentisms” are a form of bias, which is not acceptable for historians but which is almost inescapable when one tries to describe the evolution of methods and concepts.

This book is *not* about issues such as: a) the achievements of epidemiology in the control of plagues (e.g., cholera, tuberculosis, malaria, typhoid fever or lung cancer), or in describing the link between poverty and health; b) theories of disease causation (e.g., miasmatic, bacteriological, environmental, unilevel or multilevel), their evolution across time and their influence on the work of epidemiologists; c) biographies of epidemiologists even though some papers do retrace the lives and contributions of scientists like John Snow (Vandenbroucke, Part IIa; Eyler, Part IIa), William Farr (Eyler, Part IIa; Eyler, Part IIb; Eyler, Part IIc), Thomas Rowe Edmonds (Eyler, Part IIb), Wade Hampton Frost (Comstock, Part II), Major Greenwood, Ronald Ross and A. B. Hill (Hardy and Magnello, Part II). These are three very important and fascinating aspects of the history of epidemiology, but they were not our main subjects. This book focuses on the *work* of people who contributed to the *development* of epidemiologic methods or concepts.

Epidemiology teaching

I trust that this book has a place in the curriculum of students of epidemiology, because students may reach a better understanding of the methods and concepts when these are presented in their evolutionary context. Methods and concepts get refined when we are facing challenges that cannot be met using state-of-the-art approaches. These are situations of crisis that cry for innovative ideas. They provide great didactic examples.

Consider for example the distinction between the concepts of risks and incidence rates. Today students in epidemiology understand that a risk is a probability expressed over a specific period of time (e.g., the lifetime risk of breast cancer for a Western woman is 7%), and an incidence rate is a risk change by unit of time (e.g., the incidence rate of breast cancer in Geneva is 150 per 100,000 per year). But they have more difficulty catching the conceptual difference between risks and rates. Why and when should we use one or the other?

The separation of the concepts of risks and rates took place around 1838, when William Farr was responsible for the collection of vital statistics in England. Placing the students in the context, which led Farr to formally distinguish risks from rates, can illuminate the purpose of these two different measures of disease occurrence. Major killers of Farr's times were acute infections that killed quickly and whose behavior was well described by risks. Tuberculosis (then called phthisis) was not a disease of that type. It was a major threat for the public health but people perceived this menace as paradoxically less dangerous than that of less lethal diseases, such as cholera:

"Phthisis is more dangerous than cholera; but cholera, probably, excites the greatest terror." (Farr, Part II).

In terms of risks, almost all tuberculosis patients died from their disease (mortality risk = 90–100%), whereas less than half of the sick died from cholera (mortality risk = 46%). Tuberculosis was more dangerous. Why did it excite less terror? Farr explained that this was because:

"cholera destroys in a week more than phthisis consumes in a year" (Farr, Part II).

Indeed, the average duration of the disease was 2 years for tuberculosis and 7 days for cholera. When time was taken into consideration, tuberculosis appeared less frightening than cholera. Farr was able to express this nuance by using a mortality *rate*, which related the death *risk* and the average duration of the disease. The death rate for tuberculosis was small (less than 1 death per hundred patients per week) compared to the death rate of cholera (about 46 deaths per hundred patients per week). Farr concluded that it was the high mortality rate of cholera which excited terror. Both risks and rates were needed to describe, compare and understand the patterns of occurrence of cholera *vs.* tuberculosis.

The historical or scientific contexts in which innovation occurs may therefore be unique to understand the purpose of new approaches. As time goes by, successful innovations are formalized, become more abstract and their original purpose can sometimes be lost sight of in the process.

An antidote to dogmatism

There is another reason why this book can be useful for teaching epidemiology. Visualizing the evolution of methods can confer a protection against dogmatism, that is, a tendency to rigidly protect a partially understood theoretical heritage. Here is an example. Imagine that you present to a class of epidemiology students one of the analyses of the 1950 case-control study by Doll and Hill, in which 99.7% of the lung cancer cases and 95.8% of the controls free of lung cancer had ever smoked in their lifetime (Doll and Hill, 1950). Almost invariably, students who have already been exposed to the analysis of case-control studies immediately compute an odds ratio of $[(99.7 \div 0.3) : (95.8 \div 4.2)] = 14.6$ and interpret it as ever smokers having a 14.6 times greater risk of developing lung cancer than never smokers. No consideration is given to the primary finding of this analysis: the extremely high proportion of smokers in both groups. Moreover, few students can explain the conceptual background that legitimates this almost magic transformation of two exposure percentages (99.7% and 95.8%) into an impressive relative risk of 14.6. Replacing this case-control study in its context may help students to appreciate that the exposure percentages are the primary results of the case-control study. The first publications by Doll and Hill did not use odds ratios. Students are also more likely to catch the rationality of using odds ratios and interpreting them as relative risks when they visualize how the theory relating case-control studies to cohort studies has been developed over several decades.

There is a third reason for which the history of epidemiologic methods and concepts has its place in the epidemiology curriculum. Concepts and methods that evolve cannot, by definition, be carved into stone. Students may therefore realize that their role, as future epidemiologists, will also be to adapt and refine the methodological and conceptual corpus relative to the new, emerging challenges humanity faces.

How to use this book?

In order to facilitate the usage of this book for teaching purposes, an index of keywords is provided, which connects the entire content of the volume. In addition, the references of the two parts of the book have been grouped into a single bibliography section. I will try to make available additional material, including historical datasets, on www.epidemiology.ch, choose history, either directly or through web links.

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I dedicate this book to the Epistemology Group of the Wade Hampton Frost Reading Room, at The Johns Hopkins University School of Public Health, who met regularly between 1986 and 1989. Its core members were Gail Geller, Steven Goodman, Camara Phyllis Jones, Ruth Levine, Scott Zeger and me. A wonderful experience. Discussions were lively!

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Part I
Epidemiology: An epistemological perspective

