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South Asian Edition of

# Modern Epidemiology

Timothy L. Lash  
Stephen J. VanderWeele  
Vedat H. Haneuse  
Vandana K. Haneuse

4th Edition



Wolters Kluwer

# Modern Epidemiology

**Anders Ahlbom, Staffan Norell**



## **Modern Epidemiology:**

**Modern Epidemiology** Kenneth J. Rothman, Sander Greenland, Timothy L. Lash, 2008 The thoroughly revised and updated Third Edition of the acclaimed Modern Epidemiology reflects both the conceptual development of this evolving science and the increasingly focal role that epidemiology plays in dealing with public health and medical problems Coauthored by three leading epidemiologists with sixteen additional contributors this Third Edition is the most comprehensive and cohesive text on the principles and methods of epidemiologic research The book covers a broad range of concepts and methods such as basic measures of disease frequency and associations study design field methods threats to validity and assessing precision It also covers advanced topics in data analysis such as Bayesian analysis bias analysis and hierarchical regression Chapters examine specific areas of research such as disease surveillance ecologic studies social epidemiology infectious disease epidemiology genetic and molecular epidemiology nutritional epidemiology environmental epidemiology reproductive epidemiology and clinical epidemiology

**Modern Epidemiology** Kenneth J. Rothman, 2015-04-29 The thoroughly revised and updated Third Edition of the acclaimed Modern Epidemiology reflects both the conceptual development of this evolving science and the increasingly focal role that epidemiology plays in dealing with public health and medical problems Coauthored by three leading epidemiologists with contributions from sixteen experts in a variety of epidemiologic sub disciplines this new edition is by far the most comprehensive and cohesive text on the principles and methods of epidemiologic research The book covers a broad range of concepts and methods including epidemiologic measures of occurrence and effect study designs validity precision statistical interference and causal diagrams Topics in data analysis range from Bayesian analysis sensitivity analysis and bias analysis with an extensive overview of modern regression methods including logistic and survival regression splines hierarchical multilevel regression propensity scores and other scoring methods and g estimation Special topics chapters cover disease surveillance ecologic studies social epidemiology infectious disease epidemiology genetic and molecular epidemiology nutritional epidemiology environmental epidemiology reproductive epidemiology clinical epidemiology and meta analysis

**Introduction to Modern Epidemiology** Anders Ahlbom, Staffan Norell, 1990

*Modern Epidemiology* Kenneth Rothman, Timothy L. Lash, 2020-05-02 Now in a fully revised 4th Edition Modern Epidemiology remains the gold standard text in this complex and evolving field offering unparalleled comprehensive coverage of the principles and methods of epidemiologic research Featuring a new full color design updated models and a new format allowing space for margin notes this edition continues to provide authoritative information on the methodologic issues crucial to the wide range of epidemiologic applications in public health and medicine

**Modern Epidemiology** Timothy L. Lash, Tyler J. VanderWeele, Sebastien Haneuse, Kenneth Rothman, 2020-12-11 Now in a fully revised Fourth Edition Modern Epidemiology remains the gold standard text in this complex and evolving field This edition continues to provide comprehensive coverage of the principles and methods for the design analysis and interpretation of

epidemiologic research Featuring a new format allowing space for margin notes this edition Reflects both the conceptual development of this evolving science and the increasing role that epidemiology plays in improving public health and medicine Features new coverage of methods such as agent based modeling quasi experimental designs mediation analysis and causal modeling Updates coverage of methods such as concepts of interaction bias analysis and time varying designs and analysis Continues to cover the full breadth of epidemiologic methods and concepts including epidemiologic measures of occurrence and effect study designs validity precision statistical interference field methods surveillance ecologic designs and use of secondary data sources Includes data analysis topics such as Bayesian analysis probabilistic bias analysis time to event analysis and an extensive overview of modern regression methods including logistic and survival regression splines longitudinal and cluster correlated hierarchical data analysis propensity scores and other scoring methods and marginal structural models Summarizes the history specialized aspects and future directions of topical areas including among others social epidemiology infectious disease epidemiology genetic and molecular epidemiology psychiatric epidemiology injury and violence epidemiology and pharmacoepidemiology **Epidemiology Kept Simple** B. Burt Gerstman,2013-04-22

**Epidemiology Kept Simple** introduces the epidemiological principles and methods that are increasingly important in the practice of medicine and public health With minimum use of technical language it fully explains terminology concepts and techniques associated with traditional and modern epidemiology Topics include disease causality epidemiologic measures descriptive epidemiology study design clinical and primary prevention trials observational cohort studies case control studies and the consideration of random and systematic error in studies of causal factors Chapters on the infectious disease process outbreak investigation and screening for disease are also included The latter chapters introduce more advanced biostatistical and epidemiologic techniques such as survival analysis Mantel Haenszel techniques and tests for interaction This third edition addresses all the requirements of the American Schools of Public Health ASPH Epidemiological Competencies and provides enhanced clarity and readability on this difficult subject Updated with new practical exercises case studies and real world examples this title helps you develop the necessary tools to interpret epidemiological data and prepare for board exams and now also includes review questions at the end of each chapter **Epidemiology Kept Simple** continues to provide an introductory guide to the use of epidemiological methods for graduate and undergraduate students studying public health health education and nursing and for all practicing health professionals seeking professional development Historical Explorations of Modern Epidemiology Heini Hakosalo,Katariina Parhi,Annukka Sailo,2023-04-10 This volume explores the history of epidemiology from the mid twentieth century to the present Epidemiology has exerted major influence on the way that both infectious and chronic diseases are conceptualized and controlled and more generally on the way that people in modern societies think about health behavior longevity and risk This collection consists of a series of in depth analyses of the roots development and impact of epidemiological research illuminating the complex relationship between medical research

and data on the one hand and social and cultural factors on the other. The thematic and geographical scope of the book ranges from indigenous and participant perspectives to the visualization of pandemics and from Circumpolar North to East Africa. The book identifies significant historical changes and the driving forces behind them, charting forms of science-society interaction that characterize modern epidemiology. Chapter 1 and chapter 4 are available open access under a Creative Commons Attribution 4.0 International License via [link.springer.com](https://link.springer.com).

**Introduction to Modern Epidemiology** Anders Ahlbom, Staffan Norell, 1984

**Modern Epidemiology** Kenneth Rothman, Sander Greenland, 1998-01-01

**The Development of Modern Epidemiology** Walter W. Holland, Jørn Olsen, Charles du V. Florey, 2007-04-05

This book describes the evolution of epidemiology, its methods, concepts, and application over the last 100 years. Current and future epidemiologists will find this book a useful and insightful record of the events that have shaped this discipline.

**Modern Epidemiologic Principles and Concepts** Laurens Holmes, Jr., 2025-03-04

Modern Epidemiologic Principles: Concepts, Study Design, Conduct, and Application. We often conceive epidemiology in either simplistic or complex terms, and neither of these is accurate. To illustrate this, the complexities in epidemiology could be achieved by considering a study to determine the correlation between serum lipid profile (as total cholesterol, HDL, LDL, triglyceride) and total body fatness or obesity measured by BMI in children. Two laboratories measured serum lipid profiles, and one observed a correlation with BMI, while the other did not. Which is the reliable finding? To address this question, one needs to examine the context of blood drawing, since fasting blood level may provide a better indicator of serum lipid. Epidemiologic studies could be easily derailed given the inability to identify and address possible confounding. Therefore, understanding the principles and concepts used in epidemiologic studies designed and conducted to answer clinical research questions facilitates accurate and reliable findings in these areas.

Another similar example in a health-fair setting involves geography and health, termed health geography. The risk of dying in one zip code (A) was 59.5 per 100,000, and in the other zip code (B) was 35.4 per 100,000. There is a common sense and non-epidemiologic tendency to conclude that there is an increased risk of dying in zip code A. To arrive at such inference, one must first find out the age distribution of these two zip codes, since advancing age is associated with increased mortality. Indeed, zip code A is comparable to the United States population, while zip code B is the Mexican population. These two examples are indicative of the need to understand epidemiologic concepts such as confounding by age or effect measure modification prior to undertaking clinical research.

This textbook describes the basics of research in medical and clinical settings, as well as the concepts and application of epidemiologic designs in research. Design transcends statistical techniques, and no matter how sophisticated statistical modeling errors of design sampling cannot be corrected. The author of this textbook has presented a complex field in a very simplified and reader-friendly manner, with the intent that such a presentation will facilitate the understanding of the design process and epidemiologic thinking in clinical research. Additionally, this book provides a very basic explanation of how to examine the data collected for research, conduct for the possibility of confounders, and how to

address such confounders thus disentangling such effects for reliable and valid inference Research is presented as an exercise around measurement with measurement error inevitable in its conduct hence the inherent uncertainties of all findings in clinical and medical research Modern Epidemiologic Principles and Concepts for Clinicians covers research conceptualization namely research objectives questions hypothesis design implementation data collection analysis results and interpretation While the primary focus of epidemiology is to assess the relationship between exposure risk or predisposing factor and outcome disease or health related event the causal association is presented in a simplified manner including the role of quantitative evidence synthesis QES in causal inference Epidemiology has evolved over the past three decades resulting in several fields being developed This text presents in brief the perspectives and future of epidemiology in the era of the molecular basis of medicine big data 3Ts and systems science Epidemiologic evidence is more reliable if conceptualized and conducted within the context of translational transdisciplinary and team science With molecular epidemiology we are better equipped with tools to identify molecular biologic indicators of risk as well as biologic alterations in the early stages of disease and with 3 Ts and systems science we are more capable of providing accurate and reliable inference on causality and outcomes research Further the author argues that unless sampling error and confounding are identified and addressed clinical research findings will remain largely inconsistent implying an inconsequential epidemiologic approach Appropriate knowledge of research conceptualization design and statistical inference is essential for conducting clinical and biomedical research This knowledge is acquired through the understanding of epidemiologic observational non experimental and experimental designs and the choice of the appropriate test statistic for statistical inference However regardless of how sophisticated the statistical technique employed for statistical inference is study conceptualization and design are the building blocks of valid scientific evidence Since clinical research is performed to improve patients care it remains relevant to assess not only the statistical significance but the clinical and biologic importance of the findings for clinical decision making in the care of an individual patient Therefore the aim of this book is to provide clinicians biomedical researchers graduate students in research methodology students of public health and all those involved in clinical biomedical research with a simplified but concise overview of the principles and practice of epidemiology In addition the author stresses common flaws in the conduct analysis and interpretation of epidemiologic studies Valid and reliable scientific research is that which considers the following elements in arriving at the truth from the data namely biological relevance clinical importance and statistical stability and precision statistical inference based on the p value and the 90 95 and 99 percent confidence interval The interpretation of results of new research must rely on factual association or effect and the alternative explanation namely systematic error random error precision confounding and effect measure modifier Therefore unless these perspectives are disentangled the results from any given research cannot be considered reliable However even with this disentanglement all study findings remain inconclusive with some degree of uncertainty This book presents a comprehensive

guide on how to conduct clinical and medical research mainly research question formulation study implementation hypothesis testing using appropriate test statistics to analyze the data and results interpretation In so doing it attempts to illustrate the basic concepts used in study conceptualization epidemiologic design and appropriate test statistics for statistical inference from the data Therefore though statistical inference is emphasized throughout the presentation in this text equal emphasis is placed on clinical relevance or importance and biological relevance in the interpretation of the study results Specifically this book describes in basic terms and concepts how to conduct clinical and medical research using epidemiologic designs The author presents epidemiology as the main profession in the trans disciplinary approach to the understanding of complex ecologic models of disease and health Clinicians even those without preliminary or infantile knowledge of epidemiologic designs could benefit immensely from what when where who and how studies are conceptualized data collected as planned with the scale of measurement of the outcome and independent variables data edited cleaned and processed prior to analysis appropriate analysis based on statistical assumptions and rationale results tabulation for scientific appraisal results interpretation and inference Unlike most epidemiologic texts this is the first book that attempts to simplify complex epidemiologic methods for users of epidemiologic research namely clinicians and allied health researchers Additionally it is rare to find a book with integrates of basic research methodology into epidemiologic designs Finally research innovation and the current challenges of epidemiology are presented in this book to reflect the currency of the materials and the approach as well as the responses to the challenges of epidemiology today namely big data accountability and policy A study could be statistically significant but biologically and clinically irrelevant since the statistical stability of a study does not rule out bias and confounding The p value is deemphasized while the use of effect size or magnitude and confidence intervals in the interpretation of results for application in clinical decision making is recommended The use of p value could lead to an erroneous interpretation of the effectiveness of treatment For example studies with large sample sizes and very little or insignificant effects of no clinical importance may be statistically significant while studies with small samples though a large magnitude of effects are labeled negative result Such results are due to low statistical power and increasing variability hence the inability to pass the arbitrary litmus test of the 5 percent significance level Epidemiology Conceptualized Epidemiologic investigation and practice are as old as the history of modern medicine It dates back to Hippocrates circa 2 400 years ago In recommending the appropriate practice of medicine Hippocrates appealed to the physicians ability to understand the role of environmental factors in predisposition to disease and health in the community During the Middle Ages and the Renaissance epidemiologic principles continued to influence the practice of medicine as demonstrated in *De Morbis Artificum* 1713 by Ramazzini and the works on scrotal cancer in relation to chimney sweeps by Percival Pott in 1775 With the works of John Snow a British physician 1854 on cholera mortality in London the era of scientific epidemiology began By examining the distribution pattern of mortality and cholera in London Snow postulated that

cholera was caused by contaminated water Epidemiology Today Epigenomic Epidemiology There are several definitions of epidemiology but a practical definition is necessary for the understanding of this science and art Epidemiology is the basic science of public health The objective of this profession is to assess the distribution and determinants of disease disabilities injuries natural disasters tsunamis hurricanes tornados and earthquakes and health related events at the population level Epidemiologic investigation or research focuses on a specific population The basic issue is to assess the groups of people at higher risk women children men pregnant women teenagers whites African Americans Hispanics Asians poor affluent gay lesbians married single older individuals etc Epidemiology also examines how the frequency of the disease or the event of interest changes over time In addition epidemiology examines the variation of the disease of interest from place to place Simply descriptive epidemiology attempts to address the distribution of disease with respect to who when and where For example cancer epidemiologists attempt to describe the occurrence of prostate cancer by observing the differences in populations by age socioeconomic status occupation geographic locale race ethnicity etc Epidemiology also attempts to address the association between the disease and exposure For example why are some men at high risk for prostate cancer Does race ethnicity increase the risk for prostate cancer Simply is the association causal or spurious This process involves the effort to determine whether a factor exposure is associated with the disease outcome In the example of prostate cancer such exposure includes a high fat diet race ethnicity advancing age pesticides family history of prostate cancer and so on Whether or not the association is factual or a result of chance remains the focus of epidemiologic research The questions to be raised are as follows Is prostate cancer associated with pesticides Does pesticide cause prostate cancer Epidemiology often goes beyond disease exposure association or relationship to establish a causal association In this process of causal inference it depends on certain criteria one of which is the strength or magnitude of association leading to the recommendation of preventive measures However complete knowledge of the causal mechanism is not necessary prior to preventive measures for disease control Further findings from epidemiologic research facilitate the prioritization of health issues and the development and implementation of intervention programs for disease control and health promotion Epidemiology today reflects the application of gene and environment interaction in disease causation morbidity prognosis survival and mortality in subpopulation health outcomes The knowledge and understanding of subpopulation differentials in DNA methylation of specific genes and histone modification allows for the application of abnormal transcriptomes impaired gene expression protein synthesis dysfunctionality and abnormal cellular functionality This book is conceptually organized into three sections Section I deals with research methods section II epidemiologic designs as well as causal inference and perspectives in epidemiology while section III delves into perspectives epidemiologic challenges and special topics in epidemiology namely epidemiologic tree challenges emerging fields the consequentialist perspective of epidemiology and epidemiologic role in health and healthcare policy formulation as well as epigenomic epidemiology and epigenomic

determinants of health EDH Throughout this book attempts are made to describe the research methods and non experimental as well as experimental designs Section I comprises research methods with an attempt to describe the following Research objectives and purposes Research questions Hypothesis statements null and alternative Rationales for research clinical reasoning and diagnostic tests as well as Study conceptualization and conduct research question data collection data management hypothesis testing data analysis Section II comprises the epidemiologic study designs with an attempt to describe the basic notion of epidemiology and the designs used in clinical research The notion of epidemiology and the measures of disease occurrence and frequency and the measure of disease association Ecologic and cross sectional designs Case control studies Cohort studies prospective retrospective and am bidirectional Clinical trials or experimental designs and Quantitative evidence synthesis QES systematic review scientific study appraisal and causal inference Section III consists of perspectives challenges and special topics in epidemiology to illustrate the purposive role of epidemiology in facilitating the goal of public health mainly disease control and health promotion Additionally this section presents the integrative dimension of epidemiology as well as novel epidemiology as epigenomic epidemiology Epidemiologic perspectives advances challenges emerging fields and the future Consequentialism epidemiology and Role of epidemiology in health and healthcare policy formulation Specifically this section addresses the gene and environment interaction in disease causation prognosis and survival Significantly section I chapters deals with the basic descriptions of scientific research at the clinical and population levels and how the knowledge gained from the population could be applied to the understanding of individual patients in the future In these two chapters an attempt is made to discuss clinical reasoning and the use of diagnostic tests sensitivity and specificity in clinical decision making The notions numbers needed to treat NNT and numbers needed to harm NNH are discussed later in the chapter on causal inference The last chapter in this section delves into clinical research conceptualization design involving subject recruitment variable ascertainment data collection data management data analysis and the outline of the research proposal In section II epidemiologic principles and methods are presented with the intent to stress the importance of careful design in conducting clinical and biomedical research Epidemiology remains the basic science of clinical medicine and public health that deals with disease disabilities injury and health related events distributions and determinants and the application of this knowledge to the control and prevention of disease disabilities injuries and related health events at the population level Depending on the research question and whether or not the outcome disease or event of interest has occurred prior to the commencement of the study or if the investigator assigns subjects to treatment or control an appropriate design is selected for the clinical research The measures of effects or point estimates are discussed with concrete examples to illustrate the application of epidemiologic principles in arriving at a reliable and valid result Designs are illustrated with flow charts figures and boxes for distinctions and similarities The hierarchy of study design is demonstrated with randomized clinical trials RCT and the associated Meta Analysis and

quantitative evidence synthesis as the design that yields the most reliable and valid evidence from data. Though RCTs are considered the gold standard of clinical research, it is sometimes not feasible to use this design because of ethical considerations; hence the alternative need for prospective cohort design. Interpreting research findings is equally as essential as conducting the study itself. Interpretation of research findings must be informative and constructive in order to identify future research needs. A research result cannot be considered valid unless we disentangle the role of bias and confounding from a statistically significant finding, as a result can be statistically significant and yet driven by measurement selection and information bias as well as confounding. While my background in basic medical sciences and clinical medicine, internal medicine allows me to appreciate the importance of biologic and clinical relevance in the interpretation of research findings, biostatisticians without similar training must look beyond random variation, p value and confidence interval in the interpretation and utilization of clinical research findings. Therefore, quantifying the random error with a p value, a meaningful null hypothesis with a strong case against the null hypothesis requires the use of a significance level without a confidence interval deprives the reader of the ability to assess the clinical importance of the range of values in the interval. Using Fisher's arbitrary p value cutoff point for type I error, alpha level tolerance, a p value of 0.05 need not provide strong evidence against the null hypothesis, but  $p < 0.0001$  does. The precise p value should be presented without reference to arbitrary thresholds. Therefore, results of clinical and biomedical research should not be presented as significant or non-significant but should be interpreted in the context of the type of study and other available evidence. Secondly, systematic error and confounding should always be considered for findings with low p values as well as the potential for effect measure modifiers if any in the explanation of the results. Neyman and Pearson describe their accurate observation: No test based upon a theory of probability can by itself provide any valuable evidence of the truth or falsehood of a hypothesis. But we may look at the purpose of tests from another viewpoint. Without hoping to know whether each separate hypothesis is true or false, we may search for rules to govern our behavior with regard to them in following which we ensure that in the long run of experience we shall not often be wrong. This text is expected to provide practical knowledge to clinicians, biomedical researchers and public health scientists, implying all researchers use biological and biochemical specimens or samples in an attempt to understand health and disease processes at cellular, clinical and population levels. Additionally, all those who translate such data from bench to clinics in an attempt to improve the health and well being of the patients seen by healthcare providers. Further, this book describes in basic terms and concepts how to conduct clinical and biomedical research using epidemiologic designs. The author presents epidemiology as the main discipline so to speak in the transdisciplinary approach to the understanding of complex ecologic models of disease and health. Clinicians, even those without preliminary or infantile knowledge of epidemiologic designs could benefit immensely from what, when, where, who and how studies are conceptualized, data collected as planned, with the scale of measurement of the outcome and independent

variables data edited cleaned and processed prior to analysis appropriate analysis based on statistical assumptions and rationale results tabulation for scientific appraisal results interpretation and inference Unlike most epidemiologic texts this is one of the few books that attempts to simplify complex epidemiologic methods for users of epidemiologic research namely clinicians Additionally it is extremely rare to access a book with an integration of basic research methodology into epidemiologic designs Finally research innovation and the current challenges of epidemiology are presented in this book to reflect the currency of the materials and the approach

*Palaeoepidemiology* Tony Waldron, 2017-07-12 How do we identify and measure human disease in the past In the absence of soft tissue paleoepidemiologists have developed ingenious ways of assessing illness and mortality in archaeological populations In this volume the key methods of epidemiology are outlined for non specialists showing the importance of studying prevalence over incidence adjustments needed in studying past groups how to compare studies and the dangers of assessing occupation based upon bone evidence A model for planning a proper paleoepidemiological study concludes the volume Both as an introduction to epidemiology for archaeologists and as a primer on archaeological analysis for epidemiologists this book should serve the needs of both populations

**Clinical Environmental Health and Toxic Exposures** John Burke Sullivan, Gary R. Krieger, 2001 Now in its revised and updated Second Edition this volume is the most comprehensive and authoritative text in the rapidly evolving field of environmental toxicology The book provides the objective information that health professionals need to prevent environmental health problems plan for emergencies and evaluate toxic exposures in patients Coverage includes safety regulatory and legal issues clinical toxicology of specific organ systems emergency medical response to hazardous materials releases and hazards of specific industries and locations Nearly half of the book examines all known toxins and environmental health hazards A Brandon Hill recommended title

**A History of Epidemiologic Methods and Concepts** Alfredo Morabia, 2013-11-11 Methods just as diseases or scientists have their own history It is important for scientists to be aware of the genesis of the methods they use and of the context in which they were developed A History of Epidemiologic Methods and Concepts is based on a collection of contributions which appeared in SPM International Journal of Public Health starting in January 2001 The contributions focus on the historical emergence of current epidemiological methods and their relative importance at different points in time rather than on specific achievements of epidemiology in controlling plagues such as cholera tuberculosis malaria typhoid fever or lung cancer The papers present the design of prospective and retrospective studies and the concepts of bias confounding and interaction The compilation of articles is complemented by an introduction and comments by Prof Alfredo Morabia which puts them in the context of current epidemiological research

Global and Domestic Public Health and Neuroepidemiology, An Issue of the Neurologic Clinics David S. Younger, 2016-10-08 This issue of Neurologic Clinics edited by Dr David Younger is focused on Global and Domestic Public Health and Neuroepidemiology Topics covered in the issue include but are not limited to research methods gene environment interplay Alzheimer disease

headache disorders multiple sclerosis and related disorders lyme neuroborreliosis cerebrovascular disease neuro oncology community health needs assessment and neurologic public health in the BRICS

**Bubonic Plague in Early Modern Russia** John T. Alexander, 2003 John T Alexander's study dramatically highlights how the Russian people reacted to the Plague and shows how the tools of modern epidemiology can illuminate the causes of the plague's tragic course through Russia. Bubonic Plague in Early Modern Russia makes contributions to many aspects of Russian and European history: social, economic, medical, urban, demographic, and meteorological. It is particularly enlightening in its discussion of eighteenth century Russia's emergent medical profession and public health institutions and overall should interest scholars in its use of abundant new primary source material from Soviet, German, and British archives. *Etiological Explanations* Olaf

Dammann, 2020-05-26 Theory of illness causation is an important issue in all biomedical sciences and solid etiological explanations are needed in order to develop therapeutic approaches in medicine and preventive interventions in public health. Until now the literature about the theoretical underpinnings of illness causation research has been scarce and fragmented and lacking a convenient summary. This interdisciplinary book provides a convenient and accessible distillation of the current status of research into this developing field and adds a personal flavor to the discussion by proposing the etiological stance as a comprehensive approach to identify modifiable causes of illness. **Key Features:** Provides a synthesis of the epidemiological and philosophical concepts in this growing research area. Gives an accessible overview of current methods in biomedical causal metaphysics: what is a cause of illness and epistemology: how do we identify it. Proposes a novel approach that integrates modern epidemiological methodology and recent theories from philosophy of science. Written for postgraduate students and researchers in the health and biomedical sciences, including those undertaking courses in the philosophy of medicine, science, public and global health, introduction to epidemiology, research methods, and advanced reasoning, the content will also be of interest to practicing public health workers, biomedical scientists, and physicians. **ABOUT THE AUTHOR** Olaf Dammann is Professor and Vice Chair of Public Health and Community Medicine at Tufts University School of Medicine, Boston, Massachusetts, USA, as well as a Professor in the Department of Gynecology and Obstetrics at Hannover Medical School, Hannover, Germany. **Cover image:** Mask used by Eskimo shaman in causation of illness. Credit: Wellcome Collection. CC BY <https://creativecommons.org/licenses/by/4.0/>

**The Particulate Air Pollution Controversy**

Robert F. Phalen, 2007-05-08 Small invisible particles in the urban air, especially those produced by human activities, have recently stimulated intense scrutiny, debate, regulation, and legal proceedings. The stakes are high both with respect to health impacts and economic costs, and the methods used previously to resolve similar issues are no longer adequate. Everyone on earth inhales thousands to millions of particles in each breath, so if urban particulate air pollution (particulate matter, PM) is significantly hazardous, the negative impact on health could be staggering. Yet the activities that generate PM, such as farming, manufacturing, mining, transportation, and generating electricity, are themselves essential to human health and welfare.

Scientists regulators legislators activists judges lawyers journalists and representatives of the business community are actively involved in addressing the question of what should be done This complex issue presents opportunities for critically assessing the relevant knowledge and for adopting more rigorous approaches to this and similar problems What is the PM controversy and why is it a good case study for how science and public policy might better interface The PM controversy is the sum of the frequently heated debates related to the potential health risks from urban PM

**Applying Quantitative Bias Analysis to Epidemiologic Data** Timothy L. Lash, Matthew P. Fox, Aliza K. Fink, 2011-04-14 Bias analysis quantifies the influence of systematic error on an epidemiology study's estimate of association The fundamental methods of bias analysis in epidemiology have been well described for decades yet are seldom applied in published presentations of epidemiologic research More recent advances in bias analysis such as probabilistic bias analysis appear even more rarely We suspect that there are both supply side and demand side explanations for the scarcity of bias analysis On the demand side journal reviewers and editors seldom request that authors address systematic error aside from listing them as limitations of their particular study This listing is often accompanied by explanations for why the limitations should not pose much concern On the supply side methods for bias analysis receive little attention in most epidemiology curriculums are often scattered throughout textbooks or absent from them altogether and cannot be implemented easily using standard statistical computing software Our objective in this text is to reduce these supply side barriers with the hope that demand for quantitative bias analysis will follow

*Oxford Textbook of Global Public Health* Roger Detels, Martin Gulliford, Quarraisha Abdool Karim, Chorh Chuan Tan, 2017 Sixth edition of the hugely successful internationally recognised textbook on global public health and epidemiology comprehensively covering the scope methods and practice of the discipline

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