

Environmental Epidemiology. Study methods and application

Authors and editors: Dean Baker, Professor and Director, Center for Occupational and Environmental Health, University of California, Irvine, USA and Mark J Nieuwenhuijsen, Research Professor in Environmental Epidemiology, Center for Research in Environmental Epidemiology (CREAL), Barcelona, Spain.

Contains descriptions of classic studies in environmental epidemiology such as those by John Snow, the London smog episode, the arsenic problem in Bangladesh, and the Bhopal incident. Describes basic principles of environmental health and epidemiology, to introduce new readers to the topics and to act as a refresher to more experienced readers. Unique in describing specialised designs in environmental epidemiology, such as environmental time series studies and environmental cluster detection.

Air pollution, water contamination, persistent organic pollutants, pesticides, metals, and radiofrequencies are just some examples of environmental factors that have been linked to adverse health effects such as cancer, respiratory disease and reproductive problems. Environmental epidemiology studies the interaction of disease and these environmental determinants of disease at a population level. Whilst risks associated with environmental exposures are generally small, the exposed population, and hence the population burden of disease, may be large. To detect these small risks, it is therefore essential that related methods and their application are refined. In addition, there is increasing attention on environmental health issues from the public, government, and media, thus raising the profile of environmental epidemiology in preventive medicine.

This book describes the methods of environmental epidemiology, with emphasis on good practice. It outlines the basic principles of epidemiology and environmental health, and describes in more detail special environmental epidemiological designs that are rarely described in other textbooks. The principles of health risk assessment and forecasting, as well as the application of study data in these types of study, are explored. Several chapters cover practical issues in the conduct of studies, such as field work and data analyses and its requirements. Ethical issues and the role of environmental epidemiology in policy making are also covered.

Readership: Environmental epidemiologists, and those outside the field who may have to conduct studies of environmental hazards; exposure assessors; environmental scientists; public health and environmental protection officers; biostatisticians who need to analyse environment and health data; geneticists with an interest in gene-environment interaction; and environmental physicians who plan or participate in an epidemiological study.

Contents

1. What is environmental epidemiology? , Dean Baker, Bert Brunekreef and Mark Nieuwenhuijsen.
2. Review of basic environmental health and epidemiological principles , Dean Baker.
3. Environmental exposure assessment , Mark Nieuwenhuijsen and Bert Brunekreef
4. Health effects assessment , Dean Baker
5. Measurement error: consequences and design issues , Ben Armstrong
6. Study design and methods , Dean Baker
7. Data analysis , Lianne Sheppard
8. Special study designs and analyses in environmental epidemiology , Mark Nieuwenhuijsen, Klea Katsouyanni, Giota Touloumi, Dan Wartenberg, Lars Jarup, Nicky Best, Paolo Vineis and Valentina Gallo.
9. The epidemiology of chemical incidents and natural disasters , Paul Cullinan and Anna Hansell.
10. Environmental epidemiology in developing countries , Isabel Romieu and Horacio Riojas Rodríguez.
11. Practical issues in study implementation , Dean Baker.
12. Stakeholder and participant involvement , Primitivo Rojas and Raymond Neutra.
13. Ethics and environmental epidemiology , Colin Soskolne.
14. Health risk assessment , Nino Künzli and Laura Perez.
15. Analyzing and forecasting the future effects of global environmental change , Pim Martens and Maud Huygens.
16. The role and limits of epidemiology in policy arguments , Raymond Neutra.