

EDITED BY

J. MICHAEL OAKES • JAY S. KAUFMAN

METHODS IN

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# SOCIAL EPIDEMIOLOGY

SECOND EDITION

**JOSSEY-BASS**  
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**METHODS IN SOCIAL  
EPIDEMIOLOGY**

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J. Michael Oakes  
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For  
Maddy and Henry  
and  
Amelia, Julian, Louis, and Sol





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**Margaret O'Brien Caughy, Sc.D.**, is the Georgia Athletic Association Professor of Family Health Disparities in the Department of Human Development and Family Science at the University of Georgia. Dr. Caughy's research combines the unique perspectives of developmental science, epidemiology, and public health in studying the contexts of risk and resilience affecting young children. She is particularly interested in race/ethnic disparities in health and development and how these disparities can be understood within the unique ecological niches of ethnic minority families. Dr. Caughy has been the principal investigator of several studies focused on how inequities

in neighborhood structural characteristics and social processes affect the cognitive development, socioemotional functioning, and early academic achievement of young children in diverse race/ethnic groups. Another theme of her research has been methodological, specifically methods related to measuring neighborhood context and the utilization of these measures in models explaining child developmental competence using multilevel and structural equations modeling methods.

**Patricia O’Campo, Ph.D.**, is Professor of Epidemiology at the Dalla Lana School of Public Health Sciences at the University of Toronto and holds the Chair for Intersectoral Solutions to Urban Health Problems. She is co-lead on the University of Toronto’s Healthier Cities Hub, a research and education unit dedicated to work in partnership with community organizations to improve the health of those residing in urban settings. As a social epidemiologist, she has been conducting research on the social and political determinants of health and health inequalities for over 25 years. Dr. O’Campo’s work often focuses on upstream determinants of health, quantifying the impacts of structural issues and social programs, and working to propose concrete solutions. She co-edited the book *Rethinking Social Epidemiology: Toward a Science of Change* (2011, Springer), which calls for stronger evidence for and evaluations of interventions to address health inequities.

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---

## PREFACE

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This text addresses many important methodological issues faced in contemporary social epidemiologic research. The motivation for assembling this material is to increase the potential for social epidemiology to contribute meaningfully to public health knowledge and policy through stronger and clearer methodological foundations. It has been 10 years since the publication of the first edition of this book, and yet social epidemiology remains a nascent enterprise, and the methodologic approaches that characterize work in this subdiscipline are still rapidly evolving. New techniques are continually being developed or borrowed from other disciplines. Nonetheless, the bulk of published research in this area is still made up of studies for which the inferential content is modest at best. Some of this ambiguity in interpretation arises from a weak conceptual orientation about the logic underlying many common methods. This is especially true of regression, which is seldom taught with a focus on causal inference.

Without improvements in standard analytic practice, social epidemiology risks being dismissed as naïve or simplistic by policymakers as well as by the wider scientific readership. Popular imagination and scientific credence are extended readily to the rapid developments in molecular biology and genetics, even though their relevance for public health concerns remains largely speculative. In contrast, the questions posed in social epidemiology have immediate relevance for the most important public health concerns, and yet the results

of such studies rarely have the necessary clarity and robustness to alternate explanations, such as confounding and measurement error, that would allow them to enter meaningfully into the public and policy debates. This dilemma will not be solved overnight with the introduction of some exciting new statistical model, but rather slowly, over time, with the training of more careful thinkers and more assiduous analysts.

This volume is intended as a methods text, and so is unlike the handful of recent books on social epidemiology and the social determinants of health, which focus on substantive findings.

For this reason, little attention is paid to existing knowledge about social epidemiologic relations, except by way of motivation or worked examples. It is our intention, however, that this text will compliment these substantive efforts by providing a more thorough investigation of the techniques we use to gather subject matter knowledge in this field, and ways in which this research process can be improved.

Is there really a need for a separate text devoted entirely to social epidemiological methods? Why should the interested reader not just rely on the many outstanding methods texts available for epidemiology as a whole? We believe that social epidemiology as a distinct subdiscipline comprises several phenomena that are not very well addressed by traditional epidemiological texts. Foremost among these are human volition, social interaction, and collective action. Since epidemiology is a population science, it is indeed ironic that mainstream epidemiology texts say so little about human interaction, social forces, or social scientific research and understanding more generally. In noting this, we certainly do not intend to minimize the importance of medical or biological knowledge or research; there can be no doubt that these disciplines are also vital to epidemiology. Our point is only that something is missing. A more complete epidemiology includes the social, the biologic, and the quantitative, and yet the first of these, which most distinguishes our field from clinical medical investigation, is almost entirely neglected in texts written in the modern period (for example, since the appearance of Kupper, Kleinbaum, and Morgenstern's *Epidemiologic Research* in 1982 and Miettinen's *Theoretical Epidemiology* in 1985). Furthermore, we emphasize that this is obviously not a complete methods text, if such a thing were even conceivable. It is not meant to replace the traditional epidemiology texts, statistical analysis texts, or other foundational works or training. Rather, it augments these works by providing a collection of insights and some original research into the particular challenges facing the study of social relations and institutions on health.

We hope this second edition continues to serve as a learning guide, a reference tool, and a stepping stone for conceptual advancement. Our target audience remains second-year epidemiology doctoral students—those who