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b, and c in Two Populations 441
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For
Heather, Maddy, and Henry
&
Lisa, Amelia, and Julian
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. The field is only a few decades old in its current incarnation, and the methodological approaches that characterize work in this sub-discipline are still rapidly evolving. New techniques are continually 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 policy makers 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 uncertain. 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 (for example, bias, 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 that 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 sub-discipline comprises several phenomena that are not very well addressed by traditional epidemiological texts. Foremost among these are human volition, social interaction, and collective action. Because 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 biological, 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 book serves as a learning guide, a reference tool, and a stepping stone for conceptual advancement. Our target audience is second-year epidemiology doctoral students—those who have some basic training in epidemiologic methods and the capacity and interest to extend these to settings in which the exposures are social phenomena or related to the same. Accordingly, we encouraged contributing authors to write penetrating and cutting-edge chapters
that are nonetheless accessible to non-methodologist readers. Because chapter lengths were necessarily limited, we also asked our authors to include abundant citations through which interested readers might continue their study in greater detail.

The text is loosely organized into three parts: Part One, Background; Part Two, Measures and Measurement; and Part Three, Design and Analysis. Part One contains a brief introductory chapter by Oakes and Kaufman that aims to set the stage for the works that follow. The second background chapter is by Hamlin, who considers the intellectual history of methods in social epidemiology. One might well wonder what a history chapter is doing in a methods text. We would argue that it is perilous to ignore past paradigms and conventions, and so we view this chapter as the necessary foundation stone for all that follows.

The second loosely defined part contains seven chapters on measures and measurement. It is difficult to overstate the importance of this work, and there must be no doubt that better measurement is fundamental to any advance. The first chapter is by Galobardes and colleagues, who consider the construct of socioeconomic position and its central role in social epidemiology. Next is an important chapter on the measurement and analysis of race and racial discrimination by Karlsen and Nazroo; much more work is needed in this area and this chapter should move us forward with greater precision and clarity. Betson and Warlick’s chapter on measuring poverty comes next. The most enduring finding in all of health research is that poverty is not healthy, and this chapter serves as a much needed reminder that such a seemingly simple idea as poverty is anything but simple to operationalize. Following this, Harper and Lynch contribute an essential chapter in measuring health inequalities. Once again, the deep issues here are difficult and these authors help us to recognize and better appreciate the subjective aspects of these measures. Because residential segregation remains overlooked in much of epidemiology, we wanted to include cutting-edge discussion of the construct and current thinking in this volume. Reardon’s chapter not only fills the gap but offers practical insights into how such measurement can and should be done. Finally come two chapters on measuring neighborhood constructs. The first is by O’Campo and Caughy, who carefully consider methods and issues that should move us beyond naïve reliance on census data for community measurement. Community measurement must be more than the tabulation of census data. Nevertheless, census data remain vital to our practice and Messer and Kaufman demonstrate how careful use of such data may be fruitfully employed to answer some difficult questions. Taken together, the chapters in this section would seem to greatly strengthen social epidemiology’s foundation by clarifying and extending the measurement tools available to social epidemiologists aiming to understand how social processes interface with health.
The third and final part contains eight chapters on research designs, data analysis, and related issues. The first chapter, by Lantz and colleagues, is special in that it concentrates on community-based participatory research. Such an approach appears to blend well with our view of social epidemiology and merits more attention. Following this is Marsden’s thoughtful and informative chapter on understanding, measuring, and analyzing social networks. This chapter should help fill a major gap in the current literature and help strengthen formal approaches to networks. Next comes Blume and Durlauf’s penetrating yet accessible review of cutting-edge econometric approaches to modeling social interactions; because it is unlike the bulk of work being done by social epidemiologists, we imagine many will find that this work raises many questions and thus opens many new avenues for fruitful research. Many of the key methodological issues associated with the now common multilevel regression model are carefully addressed by Blakely and Subramanian. Given the near ubiquity of the multilevel model in social epidemiology, this chapter merits repeated study. Perhaps one of this volume’s more important chapters is by Hannan, who considers the fundamental statistical aspects of the design and analysis of community trials. It should be clear that we believe more attention to social epidemiological field experiments would be beneficial. Next comes Oakes and Johnson’s discussion of how and why propensity score matching methods may benefit social epidemiologic inquiry. The last two chapters are by Glymour, who explains and demonstrates, in a remarkably lucid fashion, both the use of instrumental variables technique and directed acyclic graphs. Both methods seem to hold great promise for improving social epidemiological analyses and understandings. All told, because these eight analysis chapters are infused with aspects of social interaction and causal inference, this part represents an important resource for those aiming to advance social epidemiology.

No preface is complete without acknowledgments. As in the assembly of all such works, we find ourselves in the debt of many—in fact, too many to mention, but a few merit extra special thanks from both of us. First, we gratefully acknowledge the remarkable group of contributing authors; their hard work and positive attitudes nearly made this project fun. Second, we extend extra special thanks to Mary Hearst, a doctoral candidate at the University of Minnesota, who labored tirelessly to coordinate people, paper, and content. This book would not have been completed without her. Finally, we both thank our publisher Andy Pasternack and his colleagues at Jossey-Bass. Andy encouraged us to undertake this project long before we were ready to, and he remained remarkably patient as we missed several self-imposed deadlines.

Additionally, JMO offers special thanks to his teachers, including Doug Anderton, Pete Rossi, Sam Bowles, and the late but still great Andy Anderson. He
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JMO – Minneapolis, MN
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PART ONE

BACKGROUND