Introduction to Epidemiologic Research Methods in Public Health Practice

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JONES & BARTLETT LEARNING
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I (Dr. Handu) want to extend my greatest gratitude to all my mentors and my students, without whom I would not have realized my love for teaching. On a personal note, a big thank you to my husband and my two kids (6 and 2 year olds) for their love and patience during this project.
You are reading this preface for one of two reasons: (1) your instructor has chosen this text for your class on research methods, or (2) you are considering choosing this text as a resource or guide for your own research study. This text is written to serve both purposes. Details about research procedures are presented in a way to educate you as a student and to serve as a road map for you as a researcher to navigate the options, limitations, necessary assumptions, and realistic expectations of your research study. Take a deep breath and move through the process systematically.

If you are a novice researcher, your most important goals are to determine what is possible in your study (overreaching is a common problem for the inexperienced investigator) and to focus on doing everything possible to conduct the strongest study in terms of validity. More simply, the best initial lesson is to learn how to make the absolute best of what is available to you.

Most likely you have some background in research as a student, or perhaps as a research assistant on a study being run by someone else. In this case, you need the bigger picture of an entire study, from formulating the research question to reporting the results. This book is meant to serve as a guide for you to conduct your own study, whether a research project for a class, a thesis or dissertation or capstone, or an independent investigation as part of your career.

The study questions and exercises at the end of chapters are intended to be used for these two different purposes: At one level, the exercises are pedagogic with the goal of learning and applying new information. On a more advanced level, the exercises are intended to stimulate the development of your own study details from beginning to end.

The overall focus of this text is on quantitative methods in the field of epidemiology. Quantitative studies are not the only type of studies useful in epidemiology, but they are the primary designs for a field of study developed to
“count things”—outbreaks, deaths, injuries, and diseases. As such, it is expected that you have some general knowledge about statistics or biostatistics and about epidemiology as a field. We do review the basics of these areas, but for the purpose of choosing and initiating the use of them, not learning them anew. Throughout the book, you are given suggestions of books to consult for more detail about concepts and procedures that may be somewhat new to you.

A potentially useful analogy is to think of this book as a cookbook. The necessary ingredients are listed and the procedures explained to prepare a dish or a component of a research study. The novice researcher, like the aspiring chef, will follow the recipes exactly to the letter to maximize the probability of preparing a successful dish or conducting a successful study. With experience, both the veteran researcher and professional chef know how to adapt recipes (studies) to the tastes of diners (research audience), the available ingredients (money, time, research subjects, measures), and the appropriate possible procedures (sampling techniques, retention procedures, analysis plans). Occasionally, the experienced chef consults the cookbook when she wishes to refresh a technique or prepare a new dish. Likewise, this book can be used as a reference for researchers who wish to use a new study design or statistical technique.

Unlike culinary projects, research studies rarely come out exactly as anticipated. The researcher rarely has as much control over the details of her study in the real world as does a chef over the cooking process. Especially when studying people, it is impossible to anticipate every aspect of the study. You may get a smaller than anticipated sample. Your follow-up sample may be biased in unexpected ways. There may be a confounder you did not think to measure. With knowledge of the research process and experience with it, you will learn to anticipate and prevent likely problems and address and hopefully overcome the unlikely ones.
About the Authors

Susan L. Bailey, PhD is an Assistant Professor of Public Health at Benedictine University in Lisle, Illinois, where she teaches biostatistics, epidemiology, and research methods in the master of public health program. Her more than 20-year professional career has been devoted to public health research. Dr. Bailey has numerous publications in professional journals, including the American Journal of Public Health, American Journal of Epidemiology, Journal of Health and Social Behavior, Journal of Studies on Alcohol, and Journal of Acquired Immunity Deficiency Syndrome. She has served on the editorial board of the Journal of Health and Social Behavior and as an ad hoc reviewer for many journals. Dr. Bailey has also served as Principal and Co-Investigator on several NIH and CDC R01 grants and as a reviewer on numerous NIH grant review committees. Her general areas of research interest are risky health behaviors among adolescents and the risk of HIV and HCV infection among young injection drug users. She began her career at the Research Triangle Institute in North Carolina, where she received hands-on training in the conduct of research, from question to publication of results. Dr. Bailey’s research focus at this time was adolescent drug and alcohol use. She then served as a Research Assistant Professor of Psychiatry at the University of Pittsburgh Medical Center, where she studied substance use disorders among adolescents. Before accepting her current position at Benedictine University, Dr. Bailey served as a Research Associate Professor of Epidemiology and Biostatistics at the University of Illinois at Chicago. In this role, she was the Research Director of the Community Outreach Intervention Projects, a service and research effort serving and studying injection drug users in Chicago.

Deepa Handu, PhD, RD, LDN holds a doctoral degree in human nutrition (Michigan State University, 2005) and a master’s degree in food science and human nutrition (Maharaja Sayajirao University, India, 1997). Before joining
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Edward Hines Jr. Hospital, Department of Veteran Affairs as the Director of Dietetic Internship in 2011, Dr. Handu taught nutrition and research courses at Benedictine University and Loyola University in Chicago.

Dr. Handu’s research interests lie in the areas of public health nutrition, youth overweight prevalence and obesity risk, and diabetes. Dr. Handu has been involved in school-based intervention programs to reduce the prevalence of obesity and encourage the idea of healthy lifestyle. She has also been involved with Chicago public schools vending machine task force and has been a founding member and cochair of research for the FORWARD initiative to lower childhood obesity in DuPage County, Illinois.

Dr. Handu has delivered presentations at national professional conferences, and as coauthor of many research studies, she has a number of publications to her credit and several works in progress. Dr. Handu was selected as a 2009 Recognized Young Dietitian of the Year by the Illinois Dietetic Association. She is a past recipient of the following grant awards for research activities: Consortium to Lower Obesity in Chicago Children (2006); African American Family Initiative Project Grant (2003); Blue Cross Blue Shield Student Research Award (2001); and Council on Renal Nutrition Grant, National Kidney Foundation (2000).