Preface

This book is the product of having taught the statistics portion of an evidence-based medicine class for PharmD students for about 15 years. I think it is fair to say that relatively few students enter pharmacy school with a burning desire to learn more about statistics. Nonetheless, knowledge of statistical principles is needed to be able to read the pharmaceutical literature and make meaning of the data reported. Without the skills and confidence needed to read the literature, pharmacists cannot stay abreast of the most recent findings concerning experimental therapies that may be on the horizon or emerging safety concerns regarding medications that are currently on the market.

The primary target audience for this book is pharmacists and pharmacy students who want to be able to better understand the methods and results sections of published papers so that they are able to judge for themselves whether the conclusions reached by the author(s) are supported by the data presented. Therefore, most of the examples used throughout the book pertain to pharmacotherapy. However, students and health professionals in other areas are also likely to find the book helpful.

The book covers a broad range of topics, from descriptive statistics in Chapter 1 to survival analysis in Chapter 9 and meta-analysis in Chapter 12. Appendix A provides a summary of the statistical tests reviewed. By design, the book provides a 40,000-foot view of these topic. It does not include the type of detail needed by those responsible for developing the analytic strategy for a study or crunching the numbers themselves. There are hundreds, if not thousands, of books that provide this type of detail—usually accompanied by mind-numbing formulas. However, this book might provide a good starting point for novices to gain a better understanding of basic statistical concepts before tackling the more complex math that underlies many statistical procedures.

My teaching experience has helped me understand the concepts that students are most likely to struggle with when learning the procedures that underlie statistical inference. I hope that this experience has helped me learn to explain these concepts in simple terms, avoiding as much jargon as possible. That was my primary goal in writing this book.

Over the years, my biggest struggle in teaching has been how much detail students need. Often, when I have tried to gloss over topics (e.g., degrees of freedom), students have wanted more detail. Therefore, in this book, I provide more detail in some places than I think is absolutely necessary to understand the

basic concepts involved. However, where possible, I have put that detail in "boxed" examples. This makes the information readily available to those who want it, yet readers may skip over the boxed examples if they do not feel a need for that level of detail. In most chapters, I have also included examples from the literature to allow readers to see how the statistical procedures discussed are used in practice.

A final caveat. Although I sometimes discuss methodological issues that should be considered when interpreting the findings from a study (e.g., the distinction between control and comparison groups, correlation versus causality, control for potential confounders), this book does not include a detailed description of the strengths and weaknesses associated with different study designs (e.g., randomized controlled trials, cohort studies). Therefore, students will want to consult other sources to learn more about the methodological issues that affect the inferences that can be drawn from the results of a study.

I hope that readers enjoy this book. Most important, I hope that it enhances readers' ability to understand the findings reported in published papers in the pharmaceutical literature and think critically about the inferences that can be drawn from those findings.