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Biostatistics for Clinical and Public Health Research New York: Routledge

Ask any university student to list which subjects they find the most frustrating, and you'll find that statistics frequently makes the top three, as well as math and computer science - all of which make up the foundation of biostatistics. For students without strong quantitative background, introductory biostatistics classes often feel challenging and inaccessible. For instructors to teach effectively, it is critical to have materials that meet the needs of these students.

Dr. Melody Goodman's textbook, *Biostatistics for Clinical and Public Health Research*, is a great instructional resource to make biostatistics more approachable and relevant for a wide range of learners. One of major strengths of this book is that it explains concepts clearly and in a multifaceted way so that students of all backgrounds can understand them. For example, when probability distributions are introduced, the textbook explains each distribution using a few distinct approaches. It first shows the statistical formula for the distribution, which appeals to people who have an inclination for math or have a stronger theoretical background. This is then followed by a simple, conceptual example that is explained in a plain English kind of way - without any confusing statistical or technical jargon. The lesson also incorporates helpful tips for interpreting the formulas given for students who aren't quite as comfortable with math or who aren't familiar with interpreting the notation.

The textbook covers many concepts standard to an introductory biostatistics class, such as probability distributions, diagnostic testing, hypothesis testing, ANOVA, survival analysis, and linear and logistic regression. Within each module, the lesson is followed by practice problems, which include typical mathematical problems as well as questions that reinforce more conceptual ideas. Instead of using over-simplified datasets unrelated to public health, the problems utilize datasets essential to public health research. The datasets include surveys from the National Health and Nutrition Examination Survey (NHANES) and the Behavioral Risk Factor Surveillance System (BRFSS). This will help students feel more skilled in analyzing public health data interpreting statistics in the context of health outcomes.

This textbook includes hands-on workbook components, which will help students utilize these lessons for data analysis. Students often find it difficult to translate their conceptual understanding of theory to implementing analyses on real data. To bridge this gap, the textbook presents five comprehensive walkthrough-style lab exercises. These exercises are formatted such that the student may choose to complete them in either SAS or Stata. The reader is familiarized to the dataset and asked to produce a hypothesis and test it using commands given in the module. Expected results are shown in both SAS and Stata output, and are accompanied by questions prompting the reader to consider the implications of the results and how they are affected by the study design.

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This multifaceted approach may seem like common sense, but in my experience, most introductory textbooks don't go to such effort to cater to a diverse set of readers. Instead of adopting the 'sink or swim' method of learning, where students are immersed in the jargon and theoretical concepts of a particular area of study, this textbook seeks to ease students into the field of biostatistics. By demonstrating the practical side to biostatistics methodology, this approach serves to ground students in their understanding of statistics in real life while developing their appreciation for its utility in public health research. I would highly recommend this textbook for any introductory undergraduate course in biostatistics as well as a non-major introductory graduate level biostatistics course.

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