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Sommario/riassunto

This book introduces the open source R software language that can be implemented in biostatistics for data organization, statistical analysis, and graphical presentation. In the years since the authors' 2014 work Introduction to Data Analysis and Graphical Presentation in Biostatistics with R, the R user community has grown exponentially and the R language has increased in maturity and functionality. This updated volume expands upon skill-sets useful for students and practitioners in the biological sciences by describing how to work with data in an efficient manner, how to engage in meaningful statistical analyses from multiple perspectives, and how to generate high-quality graphics for professional publication of their research. A common theme for research in the diverse biological sciences is that decision-making depends on the empirical use of data. Beginning with a focus on data from a parametric perspective, the authors address topics such as Student t-Tests for independent samples and matched pairs; oneway and twoway analyses of variance; and correlation and linear regression. The authors also demonstrate the importance of a nonparametric perspective for quality assurance through chapters on the Mann-Whitney U Test, Wilcoxon Matched-Pairs Signed-Ranks test, Kruskal-Wallis H-Test for Oneway Analysis of Variance, and the Friedman Twoway Analysis of Variance. To address the element of data presentation, the book also provides an extensive review of the many graphical functions available with R. There are now perhaps more than 15,000 external packages available to the R community. The authors place special emphasis on graphics using the lattice package and the ggplot2 package, as well as less common, but equally useful, figures such as bean plots, strip charts, and violin plots. A robust package of supplementary material, as well as an introduction of the development of both R and the discipline of biostatistics, makes this ideal for novice learners as well as more experienced practitioners.