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| Nota di contenuto       | Robust Methods in Biostatistics; Contents; Preface; Acknowledgments; 1 Introduction; What is Robust Statistics?; Against What is Robust Statistics Robust?; Are Diagnostic Methods an Alternative to Robust Statistics? .; How do Robust Statistics Compare with Other Statistical Procedures in Practice?; 2 Key Measures and Results; Introduction; Statistical Tools for Measuring Robustness Properties; The Influence Function; The Breakdown Point; Geometrical Interpretation; The Rejection Point; General Approaches for Robust Estimation; The General Class of M-estimators; Properties of M-estimators<br>The Class of S-estimators<br>Statistical Tools for Measuring Tests<br>Robustness; Sensitivity of the Two-sample t-test; Local Stability of a Test: the Univariate Case; Global Reliability of a Test: the Breakdown Functions; General Approaches for Robust Testing; Wald Test, Score Test and LRT; Geometrical Interpretation; General -type Classes of Tests; Asymptotic Distributions; Robustness Properties; 3 Linear Regression; Introduction; Estimating the Regression Parameters; The Regression Model; Robustness Properties of the LS and MLE Estimators; Glomerular Filtration Rate (GFR) Data Example<br>Robust Estimators<br>GFR Data Example (continued); Testing the |

Regression Parameters; Significance Testing; Diabetes Data Example; Multiple Hypothesis Testing; Diabetes Data Example (continued); Checking and Selecting the Model; Residual Analysis; GFR Data Example (continued); Diabetes Data Example (continued); Coefficient of Determination; Global Criteria for Model Comparison; Diabetes Data Example (continued); Cardiovascular Risk Factors Data Example; 4 Mixed Linear Models; Introduction; The MLM; The MLM Formulation; Skin Resistance Data; Semantic Priming Data; Orthodontic Growth Data Classical Estimation and Inference Marginal and REML Estimation; Classical Inference; Lack of Robustness of Classical Procedures; Robust Estimation; Bounded Influence Estimators; S-estimators; MM-estimators; Choosing the Tuning Constants; Skin Resistance Data (continued); Robust Inference; Testing Contrasts; Multiple Hypothesis Testing of the Main Effects; Skin Resistance Data Example (continued); Semantic Priming Data Example (continued); Testing the Variance Components; Checking the Model; Detecting Outlying and Influential Observations; Prediction and Residual Analysis; Further Examples Metallic Oxide Data Orthodontic Growth Data (continued); Discussion and Extensions; 5 Generalized Linear Models; Introduction; The GLM; Model Building; Classical Estimation and Inference for GLM; Hospital Costs Data Example; Residual Analysis; A Class of M-estimators for GLMs; Choice of  $\eta$  and  $w(x)$ ; Fisher Consistency Correction; Nuisance Parameters Estimation; IF and Asymptotic Properties; Hospital Costs Example (continued); Robust Inference; Significance Testing and CIs; General Parametric Hypothesis Testing and Variable Selection; Hospital Costs Data Example (continued) Breastfeeding Data Example

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## Sommario/riassunto

Robust statistics is an extension of classical statistics that specifically takes into account the concept that the underlying models used to describe data are only approximate. Its basic philosophy is to produce statistical procedures which are stable when the data do not exactly match the postulated models as it is the case for example with outliers. Robust Methods in Biostatistics proposes robust alternatives to common methods used in statistics in general and in biostatistics in particular and illustrates their use on many biomedical datasets. The methods introduced include robust

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