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Nota di contenuto	Quantitative Methods in Population Health; List of Figures; List of Tables; Contents; Preface; Acknowledgments; Acronyms; Introduction; I.1 Newborn Lung Project; I.2 Wisconsin Diabetes Registry; I.3 Wisconsin Sleep Cohort Study; Suggested Reading; 1 Review of Ordinary Linear Regression and Its Assumptions; 1.1 The Ordinary Linear Regression Equation and Its Assumptions; 1.1.1 Straight-Line Relationship; 1.1.2 Equal Variance Assumption; 1.1.3 Normality Assumption; 1.1.4 Independence Assumption; 1.2 A Note on How the Least-Squares Estimators are Obtained Output Packet I: Examples of Ordinary Regression Analyses2 The Maximum Likelihood Approach to Ordinary Regression; 2.1 Maximum

Likelihood Estimation; 2.2 Example; 2.3 Properties of Maximum Likelihood Estimators; 2.4 How to Obtain a Residual Plot with PROC MIXED; Output Packet II: Using PROC MIXED and Comparisons to PROC REG; 3 Reformulating Ordinary Regression Analysis in Matrix Notation; 3.1 Writing the Ordinary Regression Equation in Matrix Notation; 3.1.1 Example; 3.2 Obtaining the Least-Squares Estimator  $\hat{b}$  in Matrix Notation; 3.2.1 Example: Matrices in Regression Analysis 3.3 List of Matrix Operations to Know4 Variance Matrices and Linear Transformations; 4.1 Variance and Correlation Matrices; 4.1.1 Example; 4.2 How to Obtain the Variance of a Linear Transformation; 4.2.1 Two Variables; 4.2.2 Many Variables; 5 Variance Matrices of Estimators of Regression Coefficients; 5.1 Usual Standard Error of Least-Squares Estimator of Regression Slope in Nonmatrix Formulation; 5.2 Standard Errors of Least-Squares Regression Estimators in Matrix Notation; 5.2.1 Example; 5.3 The Large Sample Variance Matrix of Maximum Likelihood Estimators 5.4 Tests and Confidence Intervals5.4.1 Example-Comparing PROC REG and PROC MIXED; 6 Dealing with Unequal Variance Around the Regression Line; 6.1 Ordinary Least Squares with Unequal Variance; 6.1.1 Examples; 6.2 Analysis Taking Unequal Variance into Account; 6.2.1 The Functional Transformation Approach; 6.2.2 The Linear Transformation Approach; 6.2.3 Standard Errors of Weighted Regression Estimators; Output Packet III: Applying the Empirical Option to Adjust Standard Errors; Output Packet IV: Analyses with Transformation of the Outcome Variable to Equalize Residual Variance Output Packet V: Weighted Regression Analyses of GHb Data on Age7 Application of Weighting with Probability Sampling and Nonresponse; 7.1 Sample Surveys with Unequal Probability Sampling; 7.1.1 Example; 7.2 Examining the Impact of Nonresponse; 7.2.1 Example (of Reweighting as Well as Some SAS Manipulations); 7.2.2 A Few Comments on Weighting by a Variable Versus Including it in the Regression Model; Output Packet VI: Survey and Missing Data Weights; 8 Principles in Dealing with Correlated Data; 8.1 Analysis of Correlated Data by Ordinary Unweighted Least-Squares Estimation; 8.1.1 Example 8.1.2 Deriving the Variance Estimator

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### Sommario/riassunto

Each topic starts with an explanation of the theoretical background necessary to allow full understanding of the technique and to facilitate future learning of more advanced or new methods and softwareExplanations are designed to assume as little background in mathematics and statistical theory as possible, except that some knowledge of calculus is necessary for certain parts.SAS commands are provided for applying the methods. (PROC REG, PROC MIXED, and PROC GENMOD)All sections contain real life examples, mostly from epidemiologic researchFirst chapter includes a SAS refresher

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