Inference for Categorical Variables

logistic regression = linear model for the log-odds of the outcome

analyzing relationship betwen categorical outcome and a continuous covariate

effect modification vs confounding

if we don't take effect modification into account, we get an over-generalized estimate of the relationship between the outcome and the exposure for the entire co-hort

- Breslow-Day Test examines if evidence of a differential association between two variables across the level of a third variable
    - similar limitations to Cochran-Mantel-Haenszel test

Cochran-Mantel_haenszel test

- limitations
    - can only adjust for one variable at a time

looks at two binary categorical variables while adjusting for the value of a third categorical variable

Parametric One-Sample Inference of Categorical Variables

- one-sample proportion test
    - do NOT use Yate's continuity, so specify:
        - prop.test(..., correct = FALSE)
- $\Chi^2$ goodness of fit test
    - to ensure sufficient sample size: $n \cdotp_{0} > 5$
    - don't use continunity corrections!
        - chisq.test(..., correct = FALSE)

NOTE: *one-sample single proportion test* gives a 95% CI – $\Chi^2$ does not!

Types of Probabilites

Joint, Marginal and Conditional Probabilities

- QI
    - SQUIRE 2.0 for QI Reporting
    - ☐ Stepped-wedge trial
        - Link
- Linear regression
    - Q-Q plot
    - plot of residuals
    - Cook's Distance
    - these are different!

    - correlative
    - descriptive
    - predictive
    - associative
- confounding vs. effect modification

to assess a paired difference

- create histogram
- plot as box plot
- make Q-Q plot