

Biostatistics 140.651-652

course outline

1. Probability
 - A) Set theory
 - B) Axioms
 - C) Probability
 - D) Random variables
 - E) Bayes Theorem
 - F) Probability distributions
 - G) Expectations, variances
2. Inferences for one sample
 - A) Confidence intervals for a normal means
 - B) Central limit theorem
 - C) The T distributions, t intervals
 - D) Hypothesis testing, significance levels, p-values, power
 - E) Sample size consideration
 - F) Inference for proportions
 - G) Maximum likelihood
3. Summarizing and Describing Data
 - A) Summary statistics
 - B) Empirical quantiles
 - C) QQ plots
 - D) Histograms, density estimates, stem and leaf plots
 - E) boxplots
 - F) Percentile bootstrap confidence intervals
4. The two sample problem
 - A) Comparing 2 means (paired versus independent)
 - B) Comparing two proportions
 - C) Comparing dependent proportions
 - D) Sample size
5. Contingency tables

- A) 2x2 tables
 - B) RxC tables
 - C) Three way contingency tables
 - D) Kappa
6. Statistical methods in epidemiology
- A) Prospective, case-control and cross-sectional studies
 - B) Odds ratio relative risk
 - C) Simpson's paradox
 - D) CMH test
 - E) Methods for matched/paired observations
7. Introduction to non-parametric methods (possibly skipped)
8. The analysis of count data
- A) The Poisson distribution
 - B) Inference based on count data and applications
9. One way ANOVA
- A) F test
 - B) Decomposition of sums of squares
10. Large data sets (possibly skipped)
- A) Massively parallel significance testing
 - B) FDR, FWER, Bonferoni
 - C) Borrowing information, Bayes
11. Issues and Controversies (possibly skipped)