

STAT 301 Exam 2 Preparation Fall 2009

Logistics:

- Wed Nov 4 from 2:10-4pm
- Open-book, open-notes
- Bring calculator
- Some computer use (Minitab, applets)
- Material from Mon Oct 12, Mon Oct 19 – Wed Oct 28, HW10-16

Overview:

We have analyzed studies that involve two categorical variables, for which the results can be organized in a two-way table. We have studied how to conduct inferences depending on whether the data were collected from:

- A randomized experiment
- Independent random samples
- Neither

We have also considered how the scope of conclusions to be drawn depends on how the data were collected. More specifically, random assignment allows for drawing cause/effect conclusions, and random sampling allows for generalizing to a larger population.

We have learned three ways to conduct statistical inference in this situation:

- Simulation
 - Randomization model (for randomized experiment)
 - Binomial sampling model (for independent random sampling)
- Fisher's exact test (hypergeometric probability distribution)
 - By hand
 - With Minitab
- Normal approximation
 - When conditions are satisfied
 - With Minitab

Outline:

- Simulating randomization test for assessing statistical significance with 2×2 tables
- Random assignment, observational study; cause-and-effect conclusions
- Combinations, hypergeometric probabilities, Fisher's exact test, effect of sample size
- Explanatory vs. response variable, segmented bar graph, confounding, randomized comparative experiment, blindness, double-blindness
- Relative risk, odds ratio, case-control and cohort and cross-classified studies
- Independent random sampling, null model, simulation, approximate p-value
- Two-sample z -test for comparing proportions, standard error, technical conditions, two-sample z -interval for difference in proportions
- Duality between tests and intervals, effect of sample size, practical vs. statistical significance, Wilson adjustment
- Sampling distribution of sample odds ratio, log transformation, confidence interval for population odds ratio

Advice:

- Organize notes for efficient retrieval of information/formulas
- Don't plan to use text, notes too much
 - Prepare as if exam were closed book/notes
 - Focus on understanding, not memorization
 - Be cognizant of time constraint
- Be prepared to think/explain/interpret
 - Do not just plug into formulas
 - Be ready to explain process of how you would do calculations
- Take advantage of information provided
 - Perhaps including Minitab output
- Relate conclusions to context
- Re-work in-class examples
- Re-work HW questions
- Work on optional review problems from text::; check solutions via Blackboard
 - Ch1: 20, 21, 23, 24, 26, 43, 44, 46, 47, 51
 - Ch5: 1, 3, 5, 8, 10, 13, 16, 17, 20, 22