Sections Covered

Test 1 covers chapters 1 and 2. The only topic you are not responsible for is the Empirical Rule (page 126).

Important Topics and Terms

1. Data Basics: observational unit, variable, sample, population, categorical variable, quantitative variable, explanatory variable, response variable
2. Numerical Summaries of Data: proportion, conditional proportion, two-way table, odds, relative risk, odds ratio, median, mean, five number summary, IQR, range, standard deviation, resistant measures
3. Graphical Summaries of Data: segmented bar graph, dotplot, histogram, boxplot, skewed distributions, outlier, outlier rule
4. Study Design: observational studies, randomized comparative experiments, randomization, control, treatment, placebo, blocking, blinding, double-blind, case-control study, cohort study, cross-classification study, prospective study, retrospective study, confounding variable
5. Random Variables and Probability: outcome, event, sample space, probability distribution, cumulative probability, three probability rules (sum rule, complement rule, total probability rule) equally likely, mutually exclusive, expected value, hypergeometric distribution, binomial coefficients \( \binom{n}{k} \)
6. Statistical Significance: p-value, empirical p-value, Fisher’s Exact Test, test of significance
7. Miscellaneous terms: independent, association, Simpson’s paradox, standard score (z-score), principle of least squares

Technology

Since we do not have quite enough computers for everyone to have their own, you will not be using a computer for this exam. You may, however, be given output from R that you need to interpret. You may use a calculator for the exam, but be sure to record on your test paper what you had your calculator do.

No mystery numbers allowed.

Short Answer Responses

Some of the items on the test will require “short answers”. Short answers should typically be between a couple sentences and a paragraph in length. When grading short answers, I am looking for things like completeness, clarity, accuracy, conciseness, focus, and importance in addition to correctness. In short, I am looking for high quality answers. So be thoughtful as you answer these questions. If asked for examples, pick particularly clear ones; if asked for reasons, pick important ones; etc.