

PHP2500: Introduction to Biostatistics -- Topics & Key Concepts

<u>Week :</u>	<u>Topic</u>	<u>Highlights</u>
1	Org. Mtg - Introductory Material	History, Importance, and Use of Statistics Examining and Organizing Data Lists, Tables, Graphs
2	Descriptive Statistics/ Graphical Summaries Rates and Standardization	Proportions, Mean, Median, Variance, Range Stem and Leaf Plots, Histograms, Boxplots, ECDFs Crude rates, Direct Standardization Indirect Standardization and SMRs, Confounding
3	Probability Rules I Probability Rules II	Populations, Samples, Sets, Events Union, Intersection, Mutually Exclusive Conditional probability, Independence Law of Total Probability, Bayes Theorem Sensitivity, Specificity, PPV and NPV
4	Discrete Probability Models I	Bernoulli & Binomial
5	Discrete Probability Models II Continuous Probability Models	Poisson & Hypergeometric distribution Random Sampling w/ & w/o Replacement Normal, Uniform, and Standardization
5	Likelihood Functions Expectations & Variances of RVs	Introduction and Use Expected values, Variances, Sums of RVs
7	Law of Large Numbers Central Limit Thm & Standardization	Introduction, Use, Consequence CLT, Standardization Revisited Standard Deviation versus Standard Error
8	Principles of study design / Exam Preparation Midterm Examination	Prospective, Retrospective, Case-Control Randomization and Bias, Clinical Trials Stratification/Balance/Randomization/Sample Size Topics through Week 7
9	Confidence Intervals I	Overview ; T-distribution Normal w/ Variance Known & Unknown
10	Confidence Intervals II-III Hypothesis Testing: Overview	Difference Between Means, Paired Samples Proportions One & Two Sample, Beyond Normality Null & Alternative Hypotheses, Type I & II errors P-values, Significance Levels, Mechanics

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<u>11</u>	Hypothesis Tests for Means Hypothesis Testing for Proportions	Normal Varaince (Un)Known One & Two Sample Proportions: One/Two Sample, Fisher's Exact Test Chi-square distribution
12-13	Hypothesis Testing, Contingency Tables Power and Sample Size	Odds Ratios, Contingency Tables Multiple 2x2 tables Power, Sample Size Determination
14	Nonparametric Tests McNemar's Test, One-way ANOVA	Sign, Wilcoxin Signed-Rank & Sum-Rank tests ANOVA, Correlation, Multiple comparisons
15	Final Exam	Topics through Week 14