Mel and Enid Zuckerman College of Public Health
University of Arizona

BIOS 647 Analysis of Categorical Data

Catalog Description: This course deals with the analysis of categorical data. It emphasizes applications in epidemiology, clinical trials, and other public health research, and will cover concepts and methods for binomial, multinomial, and count data, as well as proportions and incidence rates. (3 units)

Course Topics:
- Binomial Data
- Multinomial Data
- Contingency Tables
- Confounding and Effect Modification

Course Objectives: During this course, students will:

- Learn the basic theory of discrete distributions, commonly used study designs with categorical outcomes, and methods for analysis of categorical data.
- Implement the covered methods using a statistical software package.

Learning Outcomes (Competencies Obtained): Upon completion of this course students will be able to:

1. Understand basic concepts of probability, random variation and commonly used statistical probability distributions for categorical data
2. Select appropriate research designs with categorical outcomes to meet the needs of various studies, and be able to explain the limitations of implemented designs
3. Identify and apply appropriate statistical tools for categorical data, including descriptive and inferential methodologies, according to the type of study design for answering a particular research question
4. Recognize strengths and weaknesses of proposed statistical approaches, including alternative designs, data sources, and analytical methods
5. Communicate understanding of the assumptions necessary for a given statistical procedure as well as the ability to determine if the assumptions are met for a given study design or data set
6. Suggest preferred methodological alternatives to commonly used statistical methods when assumptions are not met
7. Manage data to handle a variety of practical problems in data format and structure
8. Apply appropriate statistical software in study design and data analysis involving categorical outcomes
9. Interpret and critique medical and scientific journal articles which involve categorical data