Mel and Enid Zuckerman College of Public Health
University of Arizona

EPID 573B Epidemiologic Methods

Catalog Description: This course will increase the student's understanding of research methods in epidemiology and provide practice for the epidemiology student to design research studies and review other epidemiologic research designs. (3 units)

Course Topics:

- Descriptive Studies
- Principles of Case-Control Studies
- Case-Control Design Options
- Cohort Studies

- Randomized Controlled Trials (RCT)
- Confounding & Effect Mod (EM)
- Multivariate Analyses (MVA)
- Reliability & Misclassification

Course Objectives: During this course, students will:

- Describe the strengths and limitation of various study designs.
- Differentiate the major sources of bias & contrast across study designs.
- Examine effect modification and confounding for an outcome and exposures.
- Analyze data for the best estimate of the association between disease and exposure.
- Apply study design, bias and reliability concepts to survey design.
- Develop skills to use research methods in epidemiologic, and communicate results.

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

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research
5. Compare the relative strengths and weaknesses of epidemiological study designs, and choose the most appropriate design for specific research questions
6. Calculate and interpret appropriate measures of disease frequency and excess risk across multiple study designs
7. Assess and identify strategies to minimize bias in analytic studies, along with assessing effect modification and confounding, then stratifying or adjusting as appropriate in analyses
8. Interpret epidemiological analyses in the context of published literature and communicate key findings to various audiences
9. Select appropriate study design for assessing the association between a given exposure and an outcome, and then understanding advantages and limitations of these approaches
10. Identify potential sources of bias for various study designs and their impact on study quality
11. Conduct descriptive and analytic analyses, including strategies to assess confounding and effect

modification methods, to make statistical inferences

12. Organize and deliver clear presentations of research findings in varying professional formats to diverse audiences

13. Design appropriate studies using causal inference principles for testing hypotheses in specific populations, after evaluating specific design advantages and limitations

14. Evaluate the integrity, comparability, and limitations of data to make inferences related to analyses and results