College of Public Health

University of Nebraska Medical Center

Doctor of Philosophy in Biostatistics

Program Competencies

Upon graduation, a student with a Doctor of Philosophy in Biostatistics should be able to...

1. Serve as an expert biostatistician on a collaborative team of investigators addressing a research question
A. Acquire knowledge and skills in advanced statistical methodologies to collaborate without supervision with research investigators
B. Formulate a research question in statistical terms
C. Communicate effectively with biomedical and public health experts, relying upon a basic understanding of human health and disease and the related basic sciences
D. Construct an appropriate study design to address a research question, and determine an associated sample size based on statistical power considerations
E. Become proficient in at least one commonly used statistical software package
F. Examine data quality and verify data values to create consistent, reliable information
G. Protect information from unauthorized access and use
H. For a particular data set, when addressing a biomedical or public health question:
1) Choose and justify an appropriate statistical model
2) Verify the model assumptions, implement the model, and correctly interpret the results of the analysis
3) Document the analysis and results in a reproducible way
4) Present in writing and orally a summary of the study results and their interpretation
2. Successfully conduct and disseminate original research on the theory and methodology of biostatistics
A. Critically review and interpret the statistical literature relevant to a particular methodological area
B. Identify important methodological problems (e.g., through participation in collaborative research)
C. Formulate methodological questions and develop novel statistical methods addressing these questions
D. Determine the statistical properties of new methods using mathematical and computer tools
E. Apply innovative statistical theory and methods to gain novel insights into biomedical or public health-related questions
F. Demonstrate deep knowledge of (at least) one statistical area, and general knowledge in the most important fields of biostatistics
G. Write and submit for publication peer-reviewed article(s) that effectively communicate novel theoretical and/or methodological developments
H. Clearly present biostatistical research findings in a research seminar

3. Effectively teach biostatistics to biostatistical and non-biostatistical audiences
A. Identify biostatistical skills needed by a group of students
B. Communicate to students the importance and utility of the material and an appreciation of it
C. Demonstrate a commitment to student learning
D. Communicate clearly and effectively in oral and written materials
4. Develop a public health perspective on research
A. Recognize the causes of morbidity and mortality and the strategies for promoting health and preventing disease and disability in a population
B. Identify the scientific methods used in public health research and practice
C. Effectively translate statistical ideas and concepts to public health collaborators
5. Demonstrate knowledge and expertise in a cognate field other than biostatistics
A. Identify the quantitative aspects of important scientific problems in an area of biomedical or public health research outside of biostatistics/statistics (i.e., in a cognate field) and develop innovative biostatistical methodology to address the problems
B. Demonstrate proficiency in the language of the cognate field
C. Review and evaluate the use of biostatistical methods in the cognate field of study
D. Engage in collaborations across fields and disciplines related to the cognate field

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