PHLTH 8001: Data Analysis for Health Researchers

Goal
The course is designed to improve your research and data-analysis expertise, refine, and maximize your analytical talents. The skills you learn from this course can be applied across the business, education, health, science, governmental, and technology fields.

Objectives
By the end of this course, you will be able to:

- Identify the appropriate statistical method for testing associations with continuous, categorical, and time-to-event outcomes.
- Analyze data arising from epidemiologic studies using appropriate software (in this course we will use STATA throughout).
- Build univariate, multivariable linear, logistic, and survival regression models for measuring association of variables with an outcome after adjusting for confounders and effect modifiers.
- Interpret the output of regression models from standard statistical programs and present the results in research papers and project reports.
- Identify dependence in epidemiological data and acquire the basic skills to account for dependence in epidemiologic data.
- Understand and evaluate statistical results present in epidemiology journals (e.g. American Journal of Epidemiology, Lancet, Preventive Veterinary Medicine etc.).

Expanded Description:
This course will be taught using a combination of short lectures and practical sessions. My approach is to teach concepts and methods used in epidemiologic data analyses so that students can choose and apply techniques appropriate for testing research hypothesis and estimation of effects/associations in selected situations. It is my expectation that the course will be taken by students with widely varying academic backgrounds ranging from those with limited exposure to statistics to those who are developing specialist skills in this subject. Consequently, unlike many other courses in statistics, the emphasis of this course will not be on formula derivations, but I reserve the right to introduce these where I believe it will help the students understand the concepts better. However, you do not need to know calculus to succeed in this course.

Most examples used during the course will be derived from data made available by STATA and other sources. Although the topic of analysis may not be in your field, I believe that you will find...
the data sets to provide appropriate examples of the epidemiologic study designs and research questions to which you can apply the techniques learned. Practical sessions will give you the chance to gain experience in conducting your own analyses, and raise queries. Many of you will work in pairs during the computer sessions. I recommend that you take advantage of this to discuss the results you obtain and the information you see on your screens. Interpretation of the output is as important as being able to program in STATA, if not more. Note that the statistical techniques you will learn in this course are simply part of a set of tools to be used to answer a research question. Statistical results need to be contextualized with other information about the population studied, biological/social mechanisms, advantages and disadvantages of the study design. Finally, I recognize that this course will be challenging for some but I hope that students enrolling in this course will find this to be a worthwhile endeavor.

Prerequisite(s):
P_HLTH 8420 or VPBIO 8455, STAT 7020

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Participants Comments:
"I almost instantly had an opportunity for practical application of what I learned in this class. The nonprofit I work for, Institute for People, Place, and Possibility submitted a proposal to Global Policy Solutions, on which I was the lead on the write up of key findings. Little did I know, I would also end up helping with the data analysis portion of the contract, for which I used Stata heavily. I happened to have enough experience with this kind of software to conduct the analysis, so it saved our organization from having to hire an external statistician. I would recommend the class to all public health students, as you never know what it will have direct application to your future work."

Maggie Kauffman MPH Student (class of 2015)