NYU GIPH Global Institute of Public Health

UGPH-GU 20
BIOSTATISTICS FOR PUBLIC HEALTH

COURSE INFORMATION

Instructor:	Perry N. Halkitis, Ph.D., M.S., M.P.H.
Email:	perry.halkitis@nyu.edu
Couse Assistant:	Charles Ferrusi
Email:	cnf243@nyu.edu
Class Schedule:	Mondays and Wednesdays 9:30-10:45AM
Class Location:	LC11
Office Hours:	Mondays 1:30-2:30PM and by appointment

COURSE DESCRIPTION

Students will examine the basic concepts and techniques of analysis of data in public health research, investigate and apply data analytic techniques which are appropriate for answering research questions and handling varying types data, report and interpret results of data analyses, consider the limitations of statistical techniques, and read and translate results from public health studies. Students will be introduced to the basic principles of statistical computing using analytic software. The course will emphasize statistical theory and techniques for determining bivariable associations, with an introduction to multivariable analysis.

COURSE OBJECTIVES

By the end of this course students will be able to:

- Understand the relationship between research questions, designs, and statistical analysis.
- Identify different levels of measurement (nominal, ordinal, interval, ratio) (categorical/nominal and continuous).
- Create displays of public health data (e.g. contingency tables, histograms, scatter-plots, etc.) for continuous and categorical/nominal data.
- Explain and compute measures of central tendency and dispersion for continuous data, and recognize of the strengths and limitations of each for descriptive purposes.
- Build and interpret confidence intervals for means and proportions.
- Understand the basic principles of hypothesis testing.
- Choose, execute and interpret appropriate parametric and non-parametric bivariable tests of association with categorical/nominal and continuous data.
- Recognize bivariable parametric and non-parametric tests of association with categorical/nominal and continuous data as they are applied in public health research, and think critically about those applications.
- Based on the type of variables utilized (categorical/nominal and continuous), identify the type of bivariable statistical analysis appropriate for answering specific questions and tests of associations.
- Consider how multivariable analyses are used in public health research when the dependent variable is continuous and when it is categorical, specifically dichotomous.
- Analyze and report findings from a large data set using parametric and non-parametric tests of association with nominal and continuous data.
- Interpret and explain research designs and statistical reported in public health and related health journals.

REQUIRED BOOKS AND READINGS

Text:

Gertsman BB. Basic *Biostatistics; Statistics For Public Health Practice.* Sudbury, MA: Bartlett and Jones; 2009.

Paper (Posted on NYU Classes):

Tranmer M & Elliot M. *Binary logistic regression*. Cathie Marsh Centre for Census and Survey research: Manchester, UK

Journal Articles (Posted on NYU Classes):

DeLongis A, Folkman S, Lazarus R. The impact of daily stress on health and mood; psychological and social resources as mediators. *J Pers Soc Psych*. 1988; 54:486-495.

Engs RC, Hanson DJ, Diebold BA. The drinking problems and patterns of a national sample of college students, 1994. *J Alc Drug Ed*. 1997; 41:13-33.

Estruch R, Ros E, Salas-Salvado J, et al. Primary prevention of cardiovascular disease with a Mediterranean diet. *NEJM*. 2013; 368:1279-1290.

Halkitis PN, Kupprat SA, Hubbard McCree D, et al. Evaluation of the relativeness effectiveness of three HIV testing strategies targeting African American men who have sex with men (MSM) in New York City. *Ann Beh Med*. 2011; 43:361-369.

Halkitis PN, Manasse A, McCready K Illicit drug use in a community-based sample of heteosexually-identified emerging adults. *J Ch Adol Sub Use*. 2010; 19:300-308.

Palamar, JJ, Kiang MV, Halkitis PN. Predictors of stigmatization towards use of various illicit drugs among emerging adults. *J Psych Drugs.* 2012; 44:243-251.

Wells TS, LeardMann CA, Fortuna SO, et al. A prospective study of depression following combat deployment in support of wars in Iraq and Afghanistan. *AJPH*. 2010100(1):90-99.

COURSE OUTLINE

	SESSION DESCRIPTION	READING	ASSIGNMENT
1/27/14	Course Overview & Introductions	Gertsman CH2	
1/29/14	Research Questions, Study Design, & Data in Public Health	Gerstman, CH 2	
2/3/14	Measurement and Variables	Gertsman CH1	
~~2/5/14~~	~~Measurement and Variables SNOW DAY CLASS WAS CANCELED~~	~~Gertsman CH1~~	~~Research Reading (Practice): Estruch et al; Wells et al~~
2/10/14	Measurement and Variables		
2/12/14	Summary Statistics & Distributions	Gertsman CH 3-4	
2/17/14	PRESIDENTS DAY: NO CLASS		
2/19/14	Review Session: Measurement, Summary Statistics, and Distributions; Preparing for Data Analysis Draft 1		Research Reading Assignment 1 Estruch et al; Wells et al
2/24/14	Confidence Intervals for Means and Proportions	Gertsman CH 8	
2/26/14	Confidence Intervals for Means and Proportions	Gertsman CH 8	Research Reading Assignment 2 Halkitis et al (2011)
3/3/14	Hypothesis Testing/the Null Hypothesis	Gertsman CH9	
3/5/14	Hypothesis Testing/the Null Hypothesis	Gertsman CH9	Data Analysis Draft 1
3/10/14	Review Session: Midterm Examination		
3/12/14	Midterm Examination		
3/17/14	SPRING BREAK: NO CLASS		
3/19/14	SPRING BREAK: NO CLASS		
3/24/14	Bivariable Associations: t-test	Gertsman CH 12	
3/26/14	Bivariable Associations: t-test	Gertsman CH 12	Research Reading Assignment 3 Halkitis et al (2010; 2011)
3/31/14	Bivariable Associations: Oneway ANOVA	Gertsman CH 13	
4/2/14	Bivariable Associations: Oneway ANOVA	Gertsman CH 13	Research Reading Assignment 4 Engs et al
4/7/14	Bivariable Associations: Correlation	Gertsman CH 14	
4/9/14	Bivariable Associations: Correlation	Gertsman CH 14	Research Reading Assignment 5 DeLongis et al; Palamar et al
4/14/14	Bivariable Associations: Chi Square Test of Independence/Odd Ratio	Gertsman CH 18	
4/16/14	Bivariable Associations: Chi Square Test of Independence/Odd Ratio	Gertsman CH 18	Research Reading Assignment 6 Engs et al
4/21/14	Review Session: Bivariable Associations; Preparing for Data Analysis Draft 2		
4/23/14	Multivariable: Overview of Regression	Gertsman CH 14	

4/28/14	Multivariable: Linear Regression	Gertsman CH 15	Data Analysis Draft 2
4/30/14	Multivariable: Binary Logistic Regression	Tranmer & Elliot	Research Reading Assignment 7 Palamar et al
5/5/14	Review Session: Multivariable Analysis; Preparing for Data Analysis Draft 3		
5/7/14	Review Session: Final Examination		
5/12/14	Final Examination		
5/14/14			Data Analysis Final Draft

COURSE REQUIREMENTS

1. Class participation (10 points): You are expected to attend and actively participate in all class sessions and activities of this course. If you cannot attend a session, it is your responsibility to notify the instructor. All other absences will be considered unexcused and will impact the final grade.

2. You are expected to come to class on time to prevent disrupting the lecture and classroom activities.

3. Complete all assigned readings prior to the class session.

4. This course will strictly adhere to NYU policies on plagiarism and academic integrity. (See the attached policy statement at the end of this syllabus)

5. Complete all assignments, due dates are noted below. **Late assignments will not be accepted**.

6. Research reading assignments (25 points): For these assignments, we will be reading, analyzing, and discussing published public health research studies that demonstrate the research and statistical techniques we are studying in class. For these activities you are asked to read the research studies and then answer a set of questions pertaining to the studies. Questions are posted at NYU Classes. We also will be discussing each of these articles thoroughly in class sessions. Assignments must be submitted at NYU Classes no later than 9AM on the due date. There are 6 required assignments; a 7th assignment (optional) may also be submitted to obtain additional class points. Due dates are shown in the adjacent table:

Assignment	Due Date
Practice	2/5/14
1	2/19/14
2	2/26/14
3	3/26/14
4	4/2/14
5	4/9/14
6	4/16/14
7 (Optional)	4/30/14

All assignments are worth 4 points. The Practice Assignment must also be submitted and you will be receiving 1 point for submitting it. Scoring of the assignments is as follows: 4 = Excellent = A; 3 = Good = B; 2 = Fair = C; 1 = Poor = D; 0 = Not Submitted or Late

7. Data analysis (25 points): This is a group assignment, which will completed in three phases and will focus on the analysis of a data set. In each phase you will be undertake data analyses to answer a set of questions and write up the analyses in the format of the results section of a journal article, like the types we will be reading in class. The assignments will build on each other. Thus you will undertake and report a set of analyses for Draft 1 (Descriptive analyses). Then you will receive feedback and edits. These edited analyses and an additional set of analyses (Bivariable analyses) will then constitute Draft 2. After Draft 2 you will again receive edits and feedback. The final draft (Draft 3) will include the edited version of Draft 2 plus an additional set of analyses (Multivariable analyses). The final product must be written in the style and format of the results sections as shown in the journal articles we have been reading and analyzing in class throughout the semester. The final product must also include a signed statement of work, which indicates what each member of the team has contributed to the final product.

Draft	Due Date
Draft 1	3/5/14
Draft 2	4/28/14
Draft 3 (Final Draft)	5/14/14

Questions to guide the analyses for each draft are posted on NYU Classes. Assignments must be submitted at NYU Classes no later than 9AM on the due date.

You must hand in both Draft 1 and Draft 2. You will receive 5 points simply for handing in each draft. In additional, you will receive feedback on each draft, which will help to improve the final draft. The final draft will be worth 15 points. Scoring for the final draft is as follows: 15-14 = Excellent = A; 13-12 = Good = B; 11-10 = Fair = C; < 10 = Poor = D; 0 = Not Submitted or Late.

You will be learning how to conduct these analyses using SPSS. You can access this software free of charge at the following ITS labs:

- Bobst Library 5th Floor Data Services Lab
- ITS Fourth Street Academic Technology Center 35 W. 4th Street, 2nd Floor
- Academic Technology Center 14 Washington Place, Lower Level

8. Midterm Examination (15 points): The midterm examination will be taken in class. The exam will consist of a set of short answer questions in which are asked you to explain, apply, interpret, and evaluate the concepts that we have studied. This also will include interpreting output from a data analyses. You are not asked to memorize and repeat any formulas. You may bring one page 8/5x11 sheet of paper to the class with notes that you can use during the course of the exam. You will have the entire class session of 3/12/14 to complete the exam. On 3/10/14 we will have an in class review session here you will have the opportunity to ask questions and I will provide you sample practice questions to familiarize you with the format of the exam. The midterm exam will cover all the concepts up to and including hypothesis testing.

9. Final Examination (25 points): The final examination will be taken in class. The exam will consist of a set of short answer questions in which are asked you to explain, apply, interpret, and evaluate the concepts that we have studied. This will include interpreting output from a data analyses. You are not asked to memorize and repeat any formulas. You may bring one page 8/5x11 sheet of paper to the class with notes that you can use during the course of the exam. You will have the entire class session of 5/12/14 to complete the exam. On 5/12/14 we will have an in class review session here you will have the opportunity to ask questions and I will provide you sample practice questions to familiarize you with the format of the exam. The midterm exam will cover all the concepts covered during the course with a particular emphasis on the material we studies after spring break.

STATEMENT OF ACADEMIC INTEGRITY

The NYU Global Institute of Public Health values both open inquiry and academic integrity. Students in the program are expected to follow standards of excellence set forth by New York University. Such standards include respect, honesty and responsibility. The GIPH does not tolerate violations to academic integrity including:

- Plagiarism
- Cheating on an exam
- Submitting your own work toward requirements in more than one course without prior approval from the instructor
- Collaborating with other students for work expected to be completed individually
- Giving your work to another student to submit as his/her own
- Purchasing or using papers or work online or from a commercial firm and presenting it as your own work

Students are expected to familiarize themselves with the GIPH and University's policy on academic integrity as they will be expected to adhere to such policies at all times – as a student and an alumni of New York University.

Plagiarism

Plagiarism, whether intended or not, is not tolerated in the GIPH. Plagiarism involves presenting ideas and/or words without acknowledging the source and includes any of the following acts:

- Using a phrase, sentence, or passage from another writer's work without using quotation marks
- Paraphrasing a passage from another writer's work without attribution
- Presenting facts, ideas, or written text gathered or downloaded from the Internet as your own
- Submitting another student's work with your name on it
- Submitting your own work toward requirements in more than one course without prior approval from the instructor
- Purchasing a paper or "research" from a term paper mill.

Students in the GIPH and GIPH courses are responsible for understanding what constitutes plagiarism. Students are encouraged to discuss specific questions with faculty instructors and to utilize the many resources available at New York University.

Disciplinary Sanctions

When a professor suspects cheating, plagiarism, and/or other forms of academic dishonesty, appropriate disciplinary action is as follows:

- The Professor will meet with the student to discuss, and present evidence for the particular violation, giving the student opportunity to refute or deny the charge(s).
- If the Professor confirms that violation(s), he/she, in consultation with the Program Director may take any of the following actions:

    - Allow the student to redo the assignment
    - Lower the grade for the work in question
    - Assign a grade of F for the work in question
    - Assign a grade of F for the course
    - Recommend dismissal

Once an action(s) is taken, the Professor will inform the Program Director and the Administrative Director, and inform the student in writing, instructing the student to schedule an appointment with the Associate Dean for Academic Affairs, as a final step. The student has the right to appeal the action taken in accordance with the GIPH Student Complaint Procedure.

STUDENTS WITH DISABILITIES:

Students with physical or learning disabilities are required to register with the Moses Center for Students with Disabilities, 726 Broadway, 2nd Floor, (212-998-4980, and online at http://www.nyu.edu/csd) and are required to present a letter from the center to the instructor at the start of the semester in order to be considered for appropriate accommodation.