



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

HPM 880 MATH/STATA TUTORIAL (3 credits)

Fall 2018

Department of Health Policy and Management
Gillings School of Global Public Health

Time/Location MW 1:25-2:40
MHRC 0001

Teaching Assistant:	Christine Kim	Instructor:	Mark Holmes
Location:	TBD	Email:	McGavran-Greenberg 1104B
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Final exam: 12:00 PM – 2:00 PM Monday, December 10. See <https://registrar.unc.edu/academic-calendar/final-examination-schedule-fall/>

Course Overview

The main purpose of this course is to prepare students for HPM 881 and HPM 771 (Spring 2019). Primary components of the course are

- 1) Principles of statistics and probability
- 2) Statistical inference and hypothesis testing
- 3) Univariate and bivariate analysis
- 4) Programming in a statistical software package
- 5) Mathematical concepts necessary for linear regression

Learning Objectives and HPM Competencies

- Select appropriate research designs and methodologies for health services/health policy research
- Understand and appropriately apply analytical strategies used in health services/health policy research

Resources

Website

The course has its own website using Sakai software (See <http://sakai.unc.edu>).

Course Materials

StataCorp. 2015. Stata Statistical Software: Release 16.0 College Station, TX: Stata Corporation. (www.stata.com)

Stata statistical software will be used in this course. Although it is available on the computers in the PhD offices and many campus computer labs, students are strongly encouraged to purchase the statistical software as it will be used extensively in HPM 881. Acquisition will be covered in class; note discounts are available through UNC using the "Stata Gradplan": <http://software.sites.unc.edu/software/stata-gradplan/>

There is no required textbook for this course. Lecture notes will be made available to students through the course web page on Sakai under *Resources*.

Optional Supplementary Texts

Wooldridge, Jeffrey M. 2009. Introductory Econometrics: A Modern Approach, Fourth Edition. South-Western College Publishing.

This textbook will be used in HPM 881. Relevant topics for this course are covered in the appendices.

Agresti, Alan and Finlay, Barbara. 2009. Statistical Methods for the Social Sciences, Fourth Edition. Pearson Prentice Hall of Pearson Education, Inc.

This textbook, previously used in HPM 470, provides an overview of key statistical concepts.

Web Sources

The Medical Expenditure Panel Survey (MEPS) dataset will be used for class examples and homework assignments. These data are available for free from the Agency for Healthcare Research and Quality (AHRQ) through their web site (www.meps.ahrq.gov). The MEPS is a very comprehensive (and complicated) dataset, which may be useful to students as they write papers even beyond this course.

Evaluation / Grading:

This course will be held twice per week. Generally, one session each week will be primarily lecture-based, while the other will be designed around in-class exercises. Homework will reinforce concepts.

The course grade will be a weighted average of performance in four areas. There will be weekly problem sets, midterm exams, a final exam, and an empirical paper. Problem sets will include a mix of written problems and computer assignments. The empirical paper allows the students to demonstrate the skills learned throughout the semester. Students should start looking now for an interesting empirical question to answer and a data set that can be used to answer that question.

Grading	Problem sets	10%
	Midterm exams	40%
	Final exam	30%
	Empirical paper	20%

<u>Minimum</u> final grades:	H 90% or higher
	P 70-90%
	L 60-70%
	F <60%

This course will have two midterms and a final exam, all of which will be taken individually (not in teams). Both midterms will be scheduled during class time. The final exam will be cumulative. The final will occur during the scheduled time on the University's final exam schedule. **Please make sure you know the dates of these exams; alternate dates will only be scheduled in cases of serious illness. Also, identify the final exams for all your cases and assess for conflict by the second week of the semester.**

2. Homework problems

Homework assignments will be required for each unit of the course. Answers to homework problems will be reviewed as warranted. Unless otherwise indicated, assignments for the class are due on Wednesdays at the beginning of class.

We reserve the right to select only a subset of questions from each problem set for grading. Questions on weekly assignments will be graded on a two-point scale:

- 2 = perfect answer
- 0 = incorrect or mostly incorrect
- 1 = somewhere in between

3. Empirical paper

Each student will write an empirical paper that will use the tools developed during the semester. Students should start looking now for an interesting empirical question to answer and a data set that can be used for this purpose. The paper will be similar to a findings brief or blog post – see <http://www.shepscenter.unc.edu/product/opioid-poisoning-hospital-use-nc/> for examples. For additional examples, see <http://www.shepscenter.unc.edu/product/opioid-poisoning-hospital-use-nc/>

Attendance

Class attendance does not explicitly contribute to your grade, but consistent attendance is recommended to gain the basic knowledge and skills needed to succeed in HPM 771/881 and beyond. In particular, the in-class exercises should provide deeper understanding.

Course Evaluation

HPM participates in the UNC-CH's online course evaluation system, enabled at the end of the semester by Scantron Class Climate. Your responses will be anonymous, with feedback provided in the aggregate. Open-ended comments will be shared with instructors, but not identified with individual students. Your participation in course evaluation is an expectation, since providing constructive feedback is a professional obligation. Feedback is critical, moreover, to improving the quality of our courses, as well as for instructor assessment. You'll be informed as to when the system will be open for students to complete evaluations for the Fall 2018 semester.

UNC Honor Code

The principles of academic honesty, integrity, and responsible citizenship govern the performance of all academic work and student conduct at the University as they have during the long life of this institution. Your acceptance of enrollment in the University presupposes a commitment to the principles embodied in the Code of Student Conduct and a respect for this most significant Carolina tradition. Your reward is in the practice of these principles.

Your participation in this course comes with the expectation that your work will be completed in full observance of the Honor Code. Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University's life and work.

If you have any questions about your responsibility or the responsibility of faculty members under the Honor Code, please consult with someone in either the Office of the Student Attorney General (966-4084) or the Office of the Dean of Students (966-4042).

Read "The Instrument of Student Judicial Governance" (<http://instrument.unc.edu>).

Recognizing, Valuing, and Encouraging Diversity

The importance of diversity is recognized in the mission statement of HPM. In the classroom, diversity *strengthens* the products, *enriches* the learning, and *broadens* the perspectives of all in the class. Diversity requires an atmosphere of inclusion and tolerance, which oftentimes challenges our own closely-held ideas, as well as our personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment. This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity.

Diversity includes consideration of: (1) life experiences, including type, variety, uniqueness, duration, personal values, political viewpoints, and intensity; and (2) factors related to "diversity of presence," including, among others, age, economic circumstances, ethnic identification, family educational attainment, disability, gender, geographic origin, maturity, race, religion, sexual orientation, social position, and veteran status.

Schedule

Week	Concept	Empirical skill	41 commands	Other commands
1	Welcome	Obtaining stata, creating a dataset, do files	help, net search, search, update clear, display, cd, pwd, describe	sysuse
2	Functions, logs, summation/expectation	Creating a dataset	generate, replace, list, browse, edit, summarize, tabulate, use, save, import, drop, keep, log, notes	if, in, do
3	Calculus	Loading a dataset and basic mgt	egen, rename, order, by, sort	
4	Data types (e.g. ordinal)	Data cleaning	table, codebook, inspect, encode, decode, count	label
5	Distributions (e.g. moments, normality)	Getting to understand data		
6	Hypothesis testing			ttest, uniform(), set seed
7	Univariate analysis			means
8	Designing a research question	Data cleaning	merge, append, compress	
9	Bivariate analyses: t-test & Kruskal-Willis, chi-square			medians, net
10	Bivariate analyses: correlation (Pearson and Spearman)			corr, pwcorr
11	Bivariate analyses: catchup			
12	Visualization / display			graph
13	Case study			
14	Case study		reshape	
15	Matrices			for, matrix
			ado, adoupdate	

Note: "41 commands" come from <https://www.stata.com/manuals13/u27.pdf>

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Fall 2018 Schedule

Week	Topic	Monday	Weds	
1	Welcome		8/22/18	
2	Functions, logs, summation/expectation	8/27/18	8/29/18	
3	Calculus	NO CLASS	9/5/18	
4	Data types (e.g. ordinal)	9/10/18	9/12/18	
5	Distributions (e.g. moments, normality)	9/17/18	9/19/18	
6	Hypothesis testing	9/24/18	MIDTERM	
7	Univariate analysis	10/1/18	10/3/18	
8	Designing a research question	10/8/18	10/10/18	
9	Bivariate analyses: t-test & Kruskal-Willis, chi-square	10/15/18	10/17/18	Fall break
10	Bivariate analyses: correlation	10/22/18	10/24/18	
11	Bivariate analyses: catchup	10/29/18	10/31/18	
12	Visualization / display	11/5/18	MIDTERM	
13	Case study	11/12/18	11/14/18	
14	Case study	11/19/18	NO CLASS	
15	Matrices	11/26/18	11/28/18	
16	Catchup	12/3/18	12/5/18	
		FINAL		