College of Public Health & Health Professions
College of Medicine

PHC 6011: Epidemiology Methods II

Summer A 2013
Mondays and Wednesdays, 12.30PM to 4.45PM
HPNP Room G201

Instructor Information

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Teaching Assistant Information

Amal Wanigatunga
asiri@ufl.edu
Office hours: TBA
Location: Student Lounge

Course Overview or Purpose

This course builds from PHC 6000 (Epidemiology Methods I) to extend understanding of epidemiologic concepts and methods by providing applied training in the conduct of secondary data analysis studies. Using data from the National Longitudinal Study of Adolescent Health Wave IV (adulthood; 2008), students will identify a research question; define a causal model, specific aims, and hypotheses based on review of extant literature; gain experience in management and conditioning of the data; conduct stratified analyses to assess effect modification and confounding; implement the backwards elimination method of model building using logistic regression to obtain multivariable results; interpret results with respect to the strength and precision of estimates, selection and information bias and confounding, and generalizability.

Course Objectives

Upon successful completion of the course, students should be able to:

- Develop a research question, specific aims, and hypothesis based on extant literature.
• Develop a directed acyclic graph to describe the hypothesized causal relationship between the exposure and outcome and to identify potential sources of confounding.

• Condition data to prepare for data analysis.

• Use stratified methods as a preliminary stage of model building to assess effect measure modification (interaction) and confounding.

• Perform the backwards elimination strategy of model building using logistic regression to adjust for interaction and confounding effects of covariates.

• Interpret results of data analysis by assessing strength and precision of estimates, presence of effect measure modification (interaction), potential sources of bias and confounding, and generalizability of findings.

• Conduct analyses using complex survey data.

• Communicate epidemiology research in writing and orally.

• Interpret human subject issues for research, with special emphasis on secondary data analysis.

**Prerequisites**

PHC 6000, PHC 6052, and PHC 6053. Admission may be restricted to epidemiology concentration students and others admitted as space is available. Students are required to have applied SAS in their regression course, preferably in PHC 6053. Students must have access to a laptop with SAS version 9.2 or higher for in-class use. This class assumes an advanced competency with epidemiology principles and vocabulary.

**Course Format**

The class includes different teaching methods. There will be didactic lectures on research and analysis techniques for which you will be assigned readings. However, the class is primarily an applied class in which students conduct all aspects of a secondary data analysis study with the guidance from the instructor and the TA. Each student will complete written and oral assignments that assess his or her ability to conduct each stage of the data analysis process, interpret the findings, and communicate findings effectively. In addition, students who are not currently certified will complete the National Institutes of Health Protecting Human Research Participants (NIH PHRP) Training [http://phrp.nihtraining.com/users/login.php](http://phrp.nihtraining.com/users/login.php) and the UF Health Insurance Portability and Accountability Act (HIPAA) Training [http://privacy.health.ufl.edu/training/Research08/online.shtml](http://privacy.health.ufl.edu/training/Research08/online.shtml). Certification of completion of these courses is due May 30, 2012.

**Course Project**

Students will be asked to use data from the National Longitudinal Study of Adolescent Health Wave IV (adulthood; 2008) or a data source of their own for which they have IRB approval at the start of the study. Students will: 1) identify a research question and formulate a causal model, specific aims, and hypotheses based on review of extant literature; 2) condition the data source; 3) assess effect measure modification and confounding using stratified methods; 4) use logistic regression for survey data to build statistical models and to measure unadjusted and adjusted associations; interpret and contextualize study findings; and 5) communicate findings by completing written assignments and oral presentations.

Students must access Wave IV of the National Longitudinal Study of Adolescent Health public use data files and the supporting documentation. The Wave IV Add Health public use data are
available on the Inter-University Consortium for Political and Social Research (ICPSR) website (http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/21600?archive=ICPSR&q=21600). Students should download the files DS23: Wave 4, Public Use Data and DS29: Wave 4, Grand Sample Weights, Public Use Data under “additional datasets”. These two data files should be merged on respondent ID number (variable name: AID). The codebooks for these datasets are available on this ICPSR website (http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/21600/documentation).

IRB Approval

The course has been granted IRB exemption status because the data are anonymous and in the public domain. However, each student team should consider providing a separate IRB exemption for their research question (to IRB 2) for maximum flexibility of the use of the data, data set, and future products. All research projects are subject to IRB approval if they continue outside the course exercise and are submitted as meeting research presentations (posters, oral presentations) or for publication.

Course Materials

Sakai

Sakai is accessible at lss.at.ufl.edu or through my.ufl.edu. You must have a valid Gatorlink ID and password to access the site. For assistance, call the UF Help Desk at 392-HELP. Students will need to log onto Sakai and print all electronic files provided for the class prior to the start of each class (except the first class). If materials are not posted in Sakai, we will provide hardcopies in class. Readings will be posted one the week prior to when they must be read. Lecture notes, provided as Power Point presentation slides, will be posted by 9pm on the day prior to the class and should be printed by students and brought to class.

Text/Readings

Required:
2. Readings as Assigned, Lecture Notes

An electronic copy of Kleinbaum and Klein (2010) is available through the UF Health Science Center Library at http://uf.catalog.fcla.edu/uf.jsp. In addition, readings will be assigned from current or historical scientific research literature.

Recommended:

Other Materials

You are expected to bring a laptop for all class sessions. Students will need to acquire the analysis software program SAS version 9.2 or higher. Each student also needs to have Power Point as class presentations require use of this program.
**Course Requirements and Grading**

The assessment is principally based on take home assignments that guide students through conduct of their secondary data analysis studies (Projects Part 1-3). In addition, students are assessed on in-class oral presentations (on their conceptual models and results); on two in-class assessments; and on class participation.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Due date</th>
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<tbody>
<tr>
<td>Oral Presentation of Conceptual Model (with Aims and Hypotheses)</td>
<td>5/20</td>
<td>10%</td>
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<tr>
<td>Project Part 1 (Conceptual Model, Univariable Description of Study Variables)</td>
<td>5/22</td>
<td>20%</td>
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<tr>
<td>SAS Test (Data Management and Analysis)</td>
<td>6/5</td>
<td>5%</td>
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<td>Project Part 2 (Assessment of Modification and Confounding Using Stratified Analyses)</td>
<td>6/10</td>
<td>20%</td>
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<tr>
<td>Quiz (Interaction Terms, Model Building)</td>
<td>6/12</td>
<td>5%</td>
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<tr>
<td>Oral Presentation of Project Part 3 (Multivariable Results and Abstract)</td>
<td>6/17, 6/19</td>
<td>10%</td>
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<tr>
<td>Project Part 3 (Multivariable Results and Abstract)</td>
<td>6/21</td>
<td>20%</td>
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<tr>
<td>Feedback on Peers’ Presentations</td>
<td>N/A</td>
<td>5%</td>
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<tr>
<td>Class Participation</td>
<td>N/A</td>
<td>5%</td>
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**Expectation for Submission of Projects Part 1-3**

You are required to submit typed responses to Projects Part 1-3. Please submit Projects Parts 1-3 electronically to Maria and Amal PRIOR TO CLASS and bring a printed version to be submitted AT THE START OF CLASS. Please label your files by indicating your team number, last names of team members, and a brief description of the file. For example, if Amal Wanigatunga and Maria Khan are team mates, and we are Team #2, we would submit our Project Part 1a assignment as: “Team2_Wanigatunga Khan_PP1a.docx.” Always cc the entire student team when you submit your work (all team members’ emails should be included regardless of who sends the final document) as one way to assure us that all team members see the submitted work. Always include a cover page with your team number, working title of your secondary data analysis study, and each student’s name.

**Expectation for Oral Presentations**

Oral presentations of conceptual models in preparation of Project Part 1 and Project Part 3 will be done in class prior to submission of the written assignment in order to obtain feedback from instructors and classmates that will inform development of the final written assignment. Students must use Microsoft Power Point for their class presentations.

**Team Expectations**

All team members (typically two) are expected to fully participate in the sequence of activities for these projects, including literature review, writing, analysis, and interpretation. Oral presentations must be shared by both team members so that instructors can gauge the knowledge and contribution of each student. Questions to the team should be answered by both team members so that each member demonstrates comprehensive involvement in the project.
Other Expectations

Students are responsible for reviewing required readings prior to each class.

Failure to complete an assignment will result in a failing grade.

Students who are not currently certified will complete the National Institutes of Health Protecting Human Research Participants (NIH PHRP) Training (http://phrp.nihtraining.com/users/login.php) and the UF Health Insurance Portability and Accountability Act (HIPAA) Training (http://privacy.health.ufl.edu/training/Research08/online.shtml). Certification of completion of these courses is due May 30, 2012.

Grading Scale

93% - 100% = A
90% - 92% = A-
87% - 89% = B+
83% - 86% = B
80% - 82% = B-
77% - 79% = C+
73% - 76% = C
70% - 72% = C-
67% - 69% = D+
63% - 66% = D
60% - 62% = D-
Below 60% = E

Course Policies

Feedback on Assignments

For Projects Part 1-3, feedback will be provided within one week. Feedback will generally be provided as electronic edits/comments on the Word document submitted by the team. Feedback on oral presentations will be provided as part of the faculty and TA Q&A at that time. In-class assessments will be graded and returned within one week.

Classroom Etiquette

Please come to class on time and be prepared to stay until the time scheduled as the end of class. We think your investment in the degree is worth maximizing your in-class experience, and we expect to provide materials that extend the full, scheduled class times. Pagers and cell phones should not be used in class. The use of cell phones, text messaging, and pagers is one of the most common complaints we have from students in recent years. Please turn them off. Or, if you expect urgent calls, set them to “vibrate.” The second most common complaint we have received is “side” conversations among students. Unless your conversation is a quick one, please consider that your conversation may interrupt the attention of someone seated near you. Some of our time will be spent working on SAS datasets, and will include team discussions - so conversations will be welcome during those “lab” sessions. We welcome in-class questions. If you have trouble getting our attention during a vigorous in-class discussion, raise your hand and/or use a loud voice. Your question will nearly always be one that other
students also have. Your questions will help us in that session, or to assess what kinds of issues and examples we should research and bring to class in the next session (or in future iterations of the class).

### Course Outline

**WEEK 1: CAUSAL DIAGRAMS AND EXPLORATION OF UNIVARIABLE DISTRIBUTIONS**

**Monday May 13**
1. Course Introduction and Expectations
2. Using Literature to Design Secondary Data Analysis Studies
3. Overview of the National Longitudinal Study of Adolescent Health (Add Health)
4. Guest Lecture, Sandie Ha (UF Department of Epidemiology Doctoral Student): Design and Analysis of Complex Survey Data
5. Development of Causal Models for Epidemiologic Research (Directed Acyclic Graphs; DAGs)

- Selection of Project Teams and Project
- Work on DAGs for Team Project

**Readings**

Please read the description of the Add Health study and review the questions asked at Wave IV:
For study design: [http://www.cpc.unc.edu/projects/addhealth/design](http://www.cpc.unc.edu/projects/addhealth/design)
For Wave IV index of questions and variable names: [http://www.cpc.unc.edu/projects/addhealth/codebooks/indexes](http://www.cpc.unc.edu/projects/addhealth/codebooks/indexes)

**Wednesday May 15**
1. Writing Study Aims and Hypotheses
2. Understanding and Coding your Variables
3. Univariable Distributions - Review of Project Part 1 Assignment (Conceptual Model, Univariable Description of Study Variables)
4. SAS Review -- Data Management and Univariable Analysis

- Work on Project Part 1

**Assignments Administered**
Project Part 1 (Conceptual Model, Univariable Description of Study Variables)
**WEEK 2: BIVARIABLE ANALYSES FOR ASSESSMENT OF CONFOUNDING AND MODIFICATION**

**Monday May 20**  
**IN CLASS:** Student Oral Presentations of Conceptual Models

- *Work on Project Part 1*

**Wednesday May 22**  
**DUE AT START OF CLASS:** PROJECT PART 1 (Conceptual Model, Univariable Description of Study Variables)

1. Assessment of Modification and Confounding using Stratified Methods, Review of Project Part 2 Assignment
2. SAS Review -- Stratified Analyses

- *Work on Project Part 2*

**Assignments Administered**  
Project Part 2 Administered (Assessment of Modification and Confounding Using Tabular Analyses)

**Readings**  

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**Week 3: LOGISTIC REGRESSION REVIEW, RE-CODING OF CONTINUOUS AND ORDINAL VARIABLES**

**Monday May 27**  
Memorial Day (No Class)

**Wednesday May 29**  
1. Review of Logistic Regression  
2. Assessment of Linearity of the Logit to Guide Coding of Continuous and Ordinal Variables  
3. Considering Missing Data  
4. SAS Review -- Logistic Regression Analysis and Interpretation

- *Work on Project Part 2*

**Reading**  
Kleinbaum and Klein, Chapter 1
Week 4: CODING AND INTERPRETING INTERACTION TERMS

Monday June 3
1. Review of Interaction in Logistic Regression
2. Guest Lecture, Sandie Ha (UF Department of Epidemiology Doctoral Student): Review of Coding, Analysis, and Interpretation of Interaction Terms Using SAS

-Work on Project Part 2

Reading
Kleinbaum and Klein Chapter 2

Wednesday June 5
IN CLASS: SAS Test (Data Management and Analyses)

-Work on Project Part 2

Week 5: BACKWARDS ELIMINATION STRATEGY OF MODEL BUILDING USING LOGISTIC REGRESSION

Monday June 10
DUE AT START OF CLASS: Project Part 2 (Assessment of Modification and Confounding Using Tabular Analyses)
1. Model Building, Interpretation of Results, Review of Project Part 3 Assignment

-Work on Project Part 3

Assignments Administered
Project Part 3 Administered (Multivariable Results and Abstract)

Reading
Kleinbaum and Klein Chapters 6-7

Wednesday June 12
IN CLASS: Quiz - Interaction Terms, Kleinbaum Chapters 6-7
1. Interpretation of Results with Respect to Error and Generalizability
2. Nuts and Bolts of Manuscript Preparation and Submission

-Work on Project Part 3
Week 6: STUDENT PRESENTATIONS

Monday June 17
IN CLASS: Team Presentations and Feedback

Wednesday June 19
IN CLASS: Team Presentations and Feedback

June 21
DUE BY 5PM VIA EMAIL: Project Part 3 (Multivariable Results and Abstract)

Academic Integrity

Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or these web sites for more details:

http://www.dso.ufl.edu/sccr/honorcodes/conductcode.php

http://www.dso.ufl.edu/studenthandbook/studentrights.php

http://gradschool.ufl.edu/students/introduction.html

Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

We, the members of the University of Florida community,
pledge to hold ourselves and our peers
to the highest standards of honesty and integrity.

Policy Related to Class Attendance

Class attendance is mandatory. Excused absences follow the criteria of the UFL Graduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the instructor prior to the missed class day when possible. UFL rules require attendance during the first two course sessions. Missing two scheduled sessions (each session is about 4 hours of instruction) will result in a failure. Students are responsible for all material presented in class and meeting the scheduled due dates for class assignments.

Policy Related to Make-up Exams or Other Work

Students are allowed to make up work ONLY as the result of an excused absence. If a student knows he or she will miss a class and an assignment is due on the missed day, the assignment must be submitted prior to the missed class day. Unless arrangements have been made prior to the day the assignment is due, 10% will be deducted for each day an assignment is late.
**Accommodations for Students with Disabilities**

Students requiring accommodations must first register with the Dean of Students' Office. The Dean of Students' Office will provide documentation to the student who must then provide this documentation to the faculty member when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework. We all learn differently: however, if you have experienced problems in university classes with writing, in-class exams, understanding or concentrating in class; please talk to us or access a learning or education testing resource at the University or in another professional setting. For your assistance, should you need them, please consider either of the following:

- University Counseling Services
  [http://www.counsel.ufl.edu/services.asp](http://www.counsel.ufl.edu/services.asp)
  P301 Peabody Hall – 392-1575
- Student Mental Health Services in the Student Health Care Center
  [http://www.health.ufl.edu/shcc](http://www.health.ufl.edu/shcc)
  Room 245, Infirmary Bldg.- 392-1171

**Counseling and Student Health**

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the UF Counseling & Wellness Center, 352-392-1575. Visit their web site for more information: [http://www.counseling.ufl.edu/](http://www.counseling.ufl.edu/).

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: [www.health.ufl.edu/shcc](http://www.health.ufl.edu/shcc)

Crisis intervention is always available 24/7 from:

- Alachua County Crisis Center:
  (352) 264-6789
  [http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx](http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx)

*BUT – Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.*