

EPID 710, FUNDAMENTALS OF EPIDEMIOLOGY**Fall 2015**

Class time T Th 11.00-12.15
Class location McGavran-Greenberg Hall 2301
Labs Variable

Instructors Daniel Westreich djw@unc.edu
Wayne Rosamond wayne_rosamond@unc.edu

TAs Devika Chawla chawlad@live.unc.edu
Nathan De Bono ndebono@live.unc.edu
Brett Thomas Doherty bdoherty@live.unc.edu

Office hours *starting August 24, also by appointment*

Instructor Friday 10.00-11.00 McGavran-Greenberg Hall 2105C (DW)
TAs Monday 3.00-4.00 Epidemiology student room (NDB)
Tuesday 12.30-1.30 Epidemiology student room (DC)
Tuesday 1.30-2.30 Epidemiology student room (BTD)

Honor code Academic integrity is at the heart of Carolina and moreover at the heart of the scientific enterprise. We all are responsible for upholding the ideals of honor and integrity. The student-led Honor System is responsible for adjudicating any suspected violations of the Honor Code and all suspected instances of academic dishonesty will be reported to the honor system. Information, including your responsibilities as a student is outlined in the Instrument of Student Judicial Governance. Your full participation and observance of the Honor Code is expected. If you have any questions about this issue, you may talk with the Instructors or a TA. (Most language directly from <http://studentconduct.unc.edu/faculty/honor-syllabus>).

University For reference, the university calendar can be found here
<http://registrar.unc.edu/academic-calendar/academic-years-2014-2015-2015-2016/>

Date	Subject	Subtopics	Readings/Assignments†
8/18	Epidemiology & society	Asking good questions; "You are they."	RO Chapters 1-2
8/20	Occurrence	Survival, risk, rate	RO Ch 4; ME3 Ch 3
8/24	LAB 1	Measures of occurrence	
8/25	Occurrence	Prevalence, incidence	
8/27	Contrasts	Differences, ratios, attributable proportions, 2x2 tables.	HR Ch 1; P1
8/31	LAB 2	Causality	
9/1	Causality	Potential outcomes; exposure/intervention; Identifiability assumptions. Causal diagrams. Systematic & random error	HR Ch 2, 3; RO Ch 3; P2; HR Ch 6 Exercise 1 out
9/3	Causality		
9/7	LABOR DAY		
9/8	RCTs 1	Theory & conduct. Modification/interaction. Power. Internal validity v. external validity (generalizability).	Exercise 1 due (9/8) HR Ch 4, 5; RO Ch 8, 9, 11; HR Ch 10
9/10	RCTs 2		
9/14	LAB 3	RCTs	
9/15	RCTs 3	Analytic approaches to trials analysis, and standardization.	
9/17	RCT example	The BAN Study (Hudgens)	P3
9/21	LAB 4	Effect Measure Modification & Interaction & Standardization	
9/22	Observational cohorts 1	Theory, conduct, analysis of observational data. Issues introduced in RCT block, revisited.	RO pp 69-87, 136-145; HR Ch 7
9/24	Observational cohorts 2		
9/28	LAB 5	Observational study theory	
9/29	Observational cohorts 3	Analytic approaches to observational cohort analysis.	RO Ch 10 Exercise 2 out
10/1	Observational example	ARIC (Heiss & Avery)	ARIC papers (TBD)
10/5	LAB 6	Confounding	
10/6	Linear regression	Intuitive intro to concepts in regression, scatterplots, OLS	RO Ch 12 Exercise 2 due
10/8	Putting it together Part I	Review of concepts so far, based on class/TA input	
10/12	NO CLASS	UNIVERSITY DAY CEREMONY	
10/13	MIDTERM		
10/15	FALL BREAK		
10/19	LAB 7	Reading/reviewing the literature	
10/20	Case-control 1	Theory, conduct; selection bias (missing data, Berkson's bias).	RO pp 87-107, 126-133; HR Ch 8; P4, P5
10/22	Case-control 2		
10/26	LAB 8	Case-control theory	
10/27	Case-control 3	Analysis of case-control studies (inc. Mantel-Haenszel)	
10/29	Case-control example	Long Island Breast Cancer study (Gammon)	(TBD)
11/2	LAB 9	Case-control analysis; selection bias	
11/3	Surveillance/screening 1	Surveillance; screening; measurement/information bias; correcting measurement bias. Exposure assessment.	RO pp 133-136; HR Ch 9
11/5	Surveillance/screening 2		
11/9	LAB 10	Surveillance	
11/10	Surveillance example		
11/12	Communicating results	Visual displays of data; interacting with policy makers	
11/16	LAB 11	Misclassification/Information bias	
11/17	Math modeling	Guest lecture by Kim Powers, UNC	Exercise 3 out
11/19	Measurement theory	Guest lecture by Steve Mooney, Columbia University	
11/23	LAB 12	Study theory; meta-analysis	
11/24	Conflicts of interest	Guest lecture by Nick King, McGill University	Exercise 3 due
11/26	THANKSGIVING		
11/30	LAB R2	TA-led review sessions	
12/1	Outro/capstone	Hierarchies of study design; other designs inc. meta-analysis.	
12/10	FINAL	At noon	

- Grading** Grades are based on four components: take-home exercises (24% of final grade); mid-term exam (24% of final grade); final exam (36% of final grade); and lab (16% of final grade). Grading for Lab is described below. High pass will be given for final grade of 90.0 and above; pass for 70.0-89.9; low pass for 60.0-69.9; fail for <60.0.
- Labs** Attendance is required without prior authorization from your TA. Participation is expected and strongly encouraged. Labs are posted one week in advance. Lab answers must be completed before class; you may work in groups and consult whatever guides you like to complete the labs; however, your words must be your own (do not copy answers word-for-word from each other). You are required to email your answers to lab questions to your TA by 9.45 the Monday of that lab session. (That is, Lab 2 is due at 9.45am 9/8.).
- Lab grade will be determined as follows: **75%** of lab grade is based on the completed labs you send to your TA. We will randomly select one question from each lab to grade as pass/fail. We will grade for effort, not for accuracy: making a valiant attempt at answering a question will get full points, even if your answer is entirely wrong. **25%** of lab grade is based on your co-leading at least one lab. Your TA will talk to you about this during the first lab session.
- Exercises** The three exercises are to be completed independently, without help from any other students. Late policy: 50% of your final score is deducted for each day late. If you have a scheduling conflict which will prevent you from completing or turning in the assignment on time, talk to the Instructor one week before the assignment is due. Reasonable exceptions will be made for sicknesses and emergencies.
- Exams** Mid-term exam is in a regular class period. Final exam is in University-assigned [final exam period](#) **December 10**. You are not permitted to access any previous exams for this class, subject to the Honor Code.
- Readings** † Italics indicate optional readings. Ch indicates chapter, pp indicates page range. Texts are:
- (RO) Rothman KJ. Epidemiology: An introduction. 2nd edition. Oxford University Press, NY, NY, 2012.
- (HR) Hernán MA, Robins JM. Causal Inference. Available online at: <http://www.hsph.harvard.edu/miguel-hernan/causal-inference-book/>
- (ME3) Rothman KJ, Greenland S, Lash TL. Modern Epidemiology (Third Edition). LWW, Philadelphia, PA, 2008.
- P1. Maldonado G, Greenland SG. Estimating causal effects. *International Journal of Epidemiology*, 2002 Apr; 31,2.
- P2. Rothman KJ, Greenland SG. Causation and causal inference in epidemiology. *Am J Pub Health*, 2005; 95(S1): S144-S150.
- P3. van der Horst C, Chasela C, Ahmed Y, et. al. Modifications of a large HIV prevention clinical trial to fit changing realities: A case study of the Breastfeeding, Antiretroviral, and Nutrition (BAN) protocol in Lilongwe, Malawi. *Contemporary Clinical Trials*, 2009; 30(1): 24-33.
- P4. Wacholder S. Design issues in case-control studies. *Stat Methods in Med Research*, 1995; 4: 293-309.
- P5. Westreich D. Berkson's bias, selection bias, and missing data. *Epidemiology*, 2012; 23(1): 159-164.

Thus "HR Ch 9" means Hernán & Robins, Causal Inference, Chapter 9.