Fall, 2016
EPID/MCH 851 Introduction to Reproductive, Perinatal, and Pediatric Epidemiology

INSTRUCTOR:  Andy Olshan, PhD
Professor and Chair, Department of Epidemiology
Email: andy_olshan@unc.edu  ~~ Office Hours by Appointment ~~

OBJECTIVE:  This course surveys the major issues relevant to the epidemiologic study of reproductive, perinatal, and children’s health. Lectures alternate between focusing on a specific substantive topic, and journal club style discussions of current literature in that area. After taking this course, students should understand the important issues in reproductive, perinatal, and pediatric health and appreciate the complexities of research in this area.

FORMAT: The course will include a combination of lectures and group discussions. We are fortunate to have many accomplished reproductive/pediatric epidemiologists in the region who share their expertise and experience with the class. Many of the lectures will include time at the end for questions and discussion of the assigned reading material – please do the assigned readings in order to get the most from the lecture and contribute to the discussions.


*Purchase at the Daniels Building Book Store, Student Union. Also available online at UNC

2. Some sessions reference manuscripts in peer reviewed professional journals. In most cases, these are available through hyperlinks at the end of this document. Alternatively, most can be accessed through UNC Health Sciences Library e-journals. Some may require you may need to enter your onyen and password.

GRADIENTS: You are expected to be present at all lectures.

Assignments - see attached for detailed description  % of Grade  Due Date
• Active participation in class discussions 10%

• Course Paper: Due in sections throughout the semester
  Approval of Paper Topic 9/13/2016
  Section 1: 10% 9/27/2016
  Section 2: 15% 10/27/2016
  Section 3: 20% 11/17/2016
  - Writing quality/clarity will be factored into the grade for each section. 5% of Section 2 and Section 3 grades will specifically apply to revisions of prior sections.

• Oral presentation of course paper 25%
• Journal Club leadership and participation 20%

Course Evaluation:
Completion of the on-line course evaluation is requested from all students. Time will be provided during for students to complete the evaluation on their laptop or at the computer lab.
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Speaker</th>
<th>Readings</th>
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<tbody>
<tr>
<td>9/1</td>
<td>Fertility</td>
<td>Anne Z. Steiner, MD, MPH Associate Professor Department of Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility UNC-CH</td>
<td><em>Fertility &amp; Pregnancy: An Epidemiologic Perspective</em>. AJ Wilcox, Chapters 2,9 <em>Reproductive and Perinatal Epidemiology</em>. Louis &amp; Platt. Chapter 4</td>
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<td>9/6</td>
<td>Birthweight &amp; Gestational Age</td>
<td>Quaker Harmon, MD PhD Postdoctoral Fellow National Institute of Environmental Health Sciences</td>
<td><em>Fertility &amp; Pregnancy: An Epidemiologic Perspective</em>. AJ Wilcox, Chapters 14, 15</td>
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9/8 Developmental Origins of Health and Disease (DoHAD)  
Alison Singer, PhD  
Postdoctoral Fellow Epidemiology  
UNC-CH


9/13 Preterm Delivery  
*approval of paper topic due  
Tracy Manuck, MD MS  
Assistant Professor  
Maternal-Fetal Medicine, Department of Obstetrics and Gynecology UNC-CH

Fertility & Pregnancy: An Epidemiologic Perspective.  
AJ Wilcox, Chapters 14, 15

9/15 Journal Club #1  
TIME TO PREGNANCY FERTILITY  
GROUP #1

http://www.fertstert.org/article/S0015-0282(15)00071-0/abstract

http://humrep.oxfordjournals.org/content/28/1/125.long

9/20 Biomarkers in Reproductive Epidemiology  
Matt Longnecker, MD, ScD  
Principal Investigator  
National Institute of Environmental Health Sciences

http://ehp.niehs.nih.gov/1408837/

http://ehp.niehs.nih.gov/1206457/

9/22 Teratology  
Scott Parnell, PhD  
Assistant Professor of Cell and Developmental Biology  
UNC-CH

No Readings. Images available at:  
http://syllabus.med.unc.edu/courseware/embryo_images/
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| 9/27 | Birth Defects | *Section 1 of paper due*  
Tania A. Desrosiers, PhD  
Epidemiologist  
NC Center for Birth Defects Research and Prevention  
**Optional:** Fertility & Pregnancy: An Epidemiologic Perspective. AJ Wilcox, Chapter 16. |
| 9/29 | Journal Club #2 | PRETERM DELIVERY  
GROUP #2  
HIV and Pregnancy  
Angie Bengston, PhD  
Postdoctoral Fellow  
UNC Chapel Hill Department of Epidemiology  
Required:  
http://jid.oxfordjournals.org/content/193/9/1195.long  
http://jid.oxfordjournals.org/content/201/7/1035.long  
Optional, for additional context:  
Tuomala RE, Yawetz S. Protease inhibitor use during pregnancy: is there an obstetrical risk? J Infect Dis. 2006 May 1;193(9):1191-4.  
http://jid.oxfordjournals.org/content/193/9/1191.long |
| 10/6  | Maternal Diet and Pregnancy Outcomes | Nelson Pace  
Doctoral Student  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3404127  
http://aje.oxfordjournals.org/content/177/11/1279.full |
| 10/11 | Medication Use During Pregnancy | Michele Jonsson-Funk, PhD  
Associate Professor  
UNC Chapel Hill Department of Epidemiology  
| 10/13 | Journal Club #3  
BIRTH DEFECTS  
GROUP #3  
http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131130 |
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<th>Topic</th>
<th>Instructor</th>
<th>Office</th>
<th>Notes</th>
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<td>10/18</td>
<td>Preeclampsia</td>
<td>Stephanie M. Engel, PhD</td>
<td>Associate Professor of Epidemiology UNC-CH</td>
<td>Fertility &amp; Pregnancy: An Epidemiologic Perspective. AJ Wilcox, Chapter 19</td>
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<td>10/20</td>
<td>- No Class -</td>
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<td>10/25</td>
<td>Male-Mediated Pregnancy and</td>
<td>Andy Olshan, PhD</td>
<td>Professor and Chair of Epidemiology UNC-CH</td>
<td>Required</td>
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<td>Development Outcomes</td>
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http://humrep.oxfordjournals.org/content/27/5/1510.long


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1940094/  


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<th>Author(s)</th>
<th>Institution</th>
<th>Details</th>
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**Pediatric Asthma**

Stephanie J. London, MD, PhD  
Principal Investigator  
National Institute of Environmental Health Sciences


Kaiser J. IMMUNOLOGY. How farm life prevents asthma. Science. 2015 Sep 12;349(6252):1034. doi: 10.1126/science.349.6252.1034. PMID: 26339003. (This is a very short, but informative, summary that accompanied an original article that is mostly a murine study in the same journal – that article for those who are interested is PMID: 26339029)

von Mutius E, Martinez FD. Inconclusive Results of Randomized Trials of Prenatal Vitamin D for Asthma Prevention in Offspring: Curbing the Enthusiasm. JAMA. 2016 Jan 26;315(4):347-8. PMID: 26813208. (This short editorial summarizes the rationale and findings for two randomized controlled trials of Vitamin D in pregnancy at doses above the RDA. For those interested in reading the original articles in JAMA they are PMIDs: 26813208 and 26813209)

**Environmental contaminants and reproductive outcomes**

Kelly Ferguson, PhD  
Principal Investigator  
National Institute of Environmental Health Sciences


**Journal Club #5 AUTISM/ADHD/NEURODEVELOPMENT**  
**Section 3 of course paper due**


Birth Spacing
Sian L. Curtis, PhD
Associate Professor of Maternal and Child Health
UNC-CH

http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6T7M-4FBFR1W-1-1&_cdi=5062&_user=130907&_pii=S0020729204004710&_origin=search&_coverDate=04%2F30%2F2005&_sk=999109999.8998&view=c&wchp=dGLzVtb-zSkWb&md5=c9fcb7e69f7de79e5dd3de4b52bcca51&ie=/sdarticle.pdf


Supplemental Methods Readings


Reproductive and Perinatal Epidemiology. Chapters 13-15
JOURNAL CLUB LEADERSHIP

Each student is required to co-lead two of five possible journal clubs. The student assignment to each session will be provided. The expectation is that student co-leaders will:

1. As a team, develop a set of draft discussion questions for the assigned papers
2. Submit questions for review to the Instructor 1 week prior to the assigned journal club date
3. On the day of the journal club, guide the structured discussion of the papers in class.

Grading will be assigned based on the following considerations:
- Quality (and timeliness) of questions
- Leadership of discussion
- Attempts to stimulate conversation on day of journal club
- Participation in discussion

Journal Clubs

1. Time to pregnancy/ fertility
2. Preterm Delivery
3. Birth Defects
4. Preeclampsia
5. Neurodevelopmental disorders

Example Questions

1. What is the scientific objective of J. Doe et al.?
2. Can anyone describe the key features of the study design? (Population, study design, exclusion/inclusion criteria)
3. What population does Doe et al. want to generalize these results to?
4. How did Doe et al. measure exposure/outcome? Do you have any concerns as to how these were measured?
5. How did Doe et al. address the possibility of confounding? What confounders were they worried about? Are there others they didn’t consider?
6. What about effect measure modification? What factors were they interested in looking at as modifiers and how were these assessed?
7. Can someone describe the key findings of this paper? What conclusions did they draw?
8. Are there any potential biases that the authors did not consider?
9. Do you believe these results are generalizable? Yes or no? If yes, to what population?
10. What would you do differently?
COURSE PAPER

Objective:
To identify an important reproductive/perinatal/pediatric question that can be addressed using epidemiologic research design, and to describe that question in writing using clear, grammatically correct, and professional language. The emphasis of this project is on formulating a good research question and how it will add to our knowledge in reproductive epidemiology. (Other courses cover the mechanics of study design and research proposals). Writing mechanics will also be incorporated into the grade. Students are encouraged to edit their sections, paying particular attention to grammar, spelling, transitions, and logical flow.

Format:
The paper will be developed and submitted in sections. Each section is well-defined (below) and should set up the rationale for the subsequent section. Turn in previous GRADED sections along with each new section. Include your name and the research question at the top of each assignment. Additional instructions are provided below.

All written assignments should be submitted via email by 5:00 on due date. Use single-spacing, 1 inch margins, and Times New Roman-12 or Arial-11 font. Double sided printing is encouraged, but not required. Electronic submissions will only be accepted for unusual circumstances that have been approved by the instructor. In fairness to those who meet the assignment deadlines, late papers will be penalized 10%/day unless unusual circumstances have been excused.

TOPIC FOR APPROVAL
Submit by email with a subject line: “EPID851 Topic”
Identify an important unresolved question about the relationship between some exposure and reproductive/perinatal/pediatric health outcome (broadly defined). Write one or two sentences about the specific topic you want to use for this project. If relevant, make sure the outcome and exposure/treatment is clearly defined and measurable. Also indicate the number of papers on this specific topic that have appeared in PUBMED in the past 10 years. The purpose of this approval is to ensure the topic is relevant and that there are enough, but not too many, publications in recent years. Ideally, there should be 3-10 published epidemiologic studies on this topic so that it is manageable for you. If there is a meta-analysis on the topic you are considering (indicating many studies) or if there is only animal literature (too few epidemiologic studies), then you will find this assignment difficult – so please consider alternate topics. A narrow, specific hypothesis makes this assignment focused and easier.

SECTION 1
Description of the Problem and why it is important (~2 paragraphs, <1 page):
- What is the incidence/prevalence of exposure and outcome?
- What is the descriptive epidemiology?
- Why is it important (severity, incidence/prevalence, cost, consequences, etc)?

SECTION 2
2. Literature Review (2 pages):
Review the pertinent literature to characterize the current state of knowledge, identify primary risk factors (mention mechanisms if they're known) and summarize the key limitations of previous research and how they impact our understanding of the topic.
- How well documented are “known” risk factors?
Is the biological/social mechanism understood?

Are studies assessing this specific topic (risk factors, treatments, or mechanisms) strong or flawed? How do methodological limitations hinder interpretation?

IMPORTANT NOTE: Turn in your GRADED Section 1 along with this new assignment. In a separate document, provide a revised Section 1 (using track changes) along with your new Section 2.

SECTION 3

3. Methodological Limitations of Previous Research and Future Directions (2 pages):
   While the literature review (Section 2) acknowledges all of the relevant methodological issues, focus this section on the one issue that has really hindered resolution of the question in previous studies or the one issue that, because it has been resolved, has set the stage for intervention/policy action. Describe how the issue has limited previous research and the implications of those limitations (e.g. type and degree of bias and likely effect on conclusions). Briefly suggest how to address this issue and describe the next steps to improve future research on the topic. Or, if flaws are few, provide rationale to support implementation of interventions or policy to address the known risk factor. i.e. if we feel confident in what is known, can we act on it rather than do more research. If not, what can be realistically addressed in future research to resolve this question?

IMPORTANT NOTE: Turn in your GRADED Sections 1 and 2 along with this new assignment. In a separate document, provide a revised Section 1 & 2 (using track changes) along with your new Section 3.
PAPER PRESENTATION

Objective:
In a brief presentation of your course paper, quickly educate the class on the topic, describe the methodological issues that have limited prior research, and recommend the next steps (specific recommendations for further research or for intervention/policy change).

Format:
The length of the presentation will be announced by the instructor. On the day that you are presenting, please arrive at 1:50 to load your presentation on the classroom PC.

When preparing slides, remember that slides should not contain lengthy text in paragraph form. They are much more effective if only a few key points are made on each slide. Graphic displays are encouraged. Too many bells and whistles are distracting and should be used sparingly.

Points to cover in the presentation:
- Primary study question or research aim
- Brief overview of literature and state of knowledge for your topic
- The methodological issue(s) that have limited previous research
- The methodological issue you have addressed and how it has limited interpretation
- Proposed next steps: the specific direction of future research or policy/intervention.

You must be succinct. Presenting the big picture in a summary/overview manner will help allow time to cover the main points in more detail without being too rushed. Practicing will help.

You will be graded on:
1. Knowledge of subject
2. Quality of information: Identification of key problems and their impact
3. Clear presentation style: Effective slides, smooth and practiced presentation
4. Response to questions