



DEPARTMENT: Epidemiology

COURSE NUMBER: EPI 746

COURSE TITLE: Reproductive Epidemiology

CREDIT HOURS: 2

SEMESTER & YEAR: Spring 2023

COURSE TEXT: *Fertility and Pregnancy: An Epidemiologic Perspective*. Allen Wilcox. 2010. Oxford University Press (also available on Kindle)

This text can be downloaded for free through the Emory University Library website:
[Fertility and Pregnancy: an Epidemiologic Perspective by Allen J. Wilcox, 2010](#)

TIME: Wednesday 8:00-9:50 AM

LOCATION: GCR P45

INSTRUCTORS: Audrey Gaskins, ScD
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OFFICE: CNR 3017

OFFICE HOURS: Wednesday 10-11 AM (after class), or by appointment

TEACHING ASSISTANT: Sarah Thornburgh (EMAIL: sarah.thornburgh@emory.edu)

BRIEF COURSE DESCRIPTION:

We will review the current state of knowledge regarding selected aspects of reproductive function and the methodologic issues encountered when conducting epidemiologic research on reproductive function.

PROGRAM COMPETENCIES:

- Describe public health problems in terms of magnitude, time, place, person and their associated risk factors
- Identify major epidemiologic problems of importance
- Identify key sources of data for epidemiologic purposes
- Formulate a research question
- Differentiate between descriptive and analytic epidemiologic methods
- Critically evaluate the strengths and weaknesses of different study designs with respect to a given research question
- Interpret epidemiologic results in a causal framework
- Evaluate the strengths and weaknesses of the epidemiologic literature

LEARNING OBJECTIVES:

- To understand the biology of reproductive function and how to use this information to design, analyze and critique epidemiologic research on reproductive function.
- To gain a general understanding of the major concepts of reproductive epidemiology, including the following:
 - Important outcomes and their measurement
 - Important exposures and their measurement
 - Methodologic issues encountered when conducting epidemiologic research on reproductive function (e.g study design, data collection, data analyses and inference).
- To be able to competently evaluate the reproductive epidemiology literature, including identifying strengths and weaknesses and the likely direction of bias in the estimated strength of association.

EVALUATION:

Grades will be based on several homework assignments, an open book, take-home midterm, a final oral presentation and class participation. Each of these counts for one-fourth of your final grade. You are responsible for material covered in class that may not be in the readings.

Final Grade Point Cutoffs*	
A	95-100
A-	90-94
B+	85-89
B	80-84
B-	75-79
C	70-74
F	<70

COURSE POLICIES:**CLASS PARTICIPATION & ATTENDANCE:**

Attendance is mandatory and class attendance will be noted each week. Your first absence will be excused, no questions asked.

RSPH POLICIES

ACADEMIC HONOR CODE:

You are bound by Emory University's Student Honor and Conduct Code. RSPH requires that all material submitted by a student fulfilling his or her academic course of study must be the original work of the student. Violations of academic honor include any action by a student indicating dishonesty or a lack of integrity in academic ethics. Academic dishonesty refers to cheating, plagiarizing, assisting other students without authorization, lying, tampering, or stealing in performing any academic work, and will not be tolerated under any circumstances.

The RSPH Honor Code states: "Plagiarism is the act of presenting as one's own work the expression, words, or ideas of another person whether published or unpublished (including the work of another student). A writer's work should be regarded as their own property." (<https://www.sph.emory.edu/rollins-life/enrollment-services/honor-code/index.html>)

ACCESSIBILITY AND ACCOMMODATIONS:

As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office of Accessibility Services (OAS). OAS works with students who have disabilities to provide reasonable accommodations. In order to receive consideration for reasonable accommodations, you must register with the OAS at <http://equityandinclusion.emory.edu/access/students/index.html>. Once registered, you will be able to initiate a request for accommodations. It is your responsibility to request accommodations. Please note that accommodations are not retroactive and that accommodations cannot be provided until your accommodation letter has been signed. I can only sign the document once you and I have discussed a plan to implement accommodations in my course. Therefore, I encourage you to contact me as early as possible in the semester to discuss this plan. For additional information about accessibility and accommodations, please contact the Office of Accessibility Services at (404) 727-9877 or accessibility@emory.edu.

Oral Presentation:

Prepare a slide presentation of 10 minutes in length. Pick from the list of topics below or suggest your own. The topic should be a question of public health importance where the epidemiologic evidence is conflicting. The student will evaluate the evidence for causality and make a judgment. The talk should end with the student's conclusion: Based on the current weight of the evidence, my judgement is that exposure to 'X' causes (or doesn't cause) outcome 'Y'. At least two epidemiologic studies of the question, with conflicting conclusions, should be reviewed in detail. The two articles should be supplemented by a literature review for other relevant material. The two research articles should be submitted at least one week before the presentation and an electronic copy of the presentation should be submitted on the day of the presentation.

- Does marijuana use during pregnancy cause [any; select one] adverse pregnancy or infant health outcomes (e.g. preeclampsia, low birthweight)?
- Does stress cause [any; select one] adverse pregnancy outcomes in women? (e.g., miscarriage, gestational diabetes)
- Does vasectomy cause an increase in the risk of prostate cancer?
- Does [any; select one] environmental exposure cause decreased semen quality in men?
- Does [any; select one] environmental exposure cause increased infertility in women?
- Does [any; select one] environmental exposure cause an increase in endometriosis or fibroids in women?
- Is progesterone supplementation effective in preventing recurrent pregnancy loss?
- Does hormone (replacement) therapy decrease the risk of cardiovascular disease?
- Does the use of assisted reproductive technology (ART) increase the risk of birth defects?

- Does sex education delay initiation of sexual activity and/or STDs?
- Does mode of delivery (e.g. C-section, VBAC) increase the risk of maternal or infant morbidity or mortality?
- Does soy exposure/ use of soy formula negatively affect [any; select one] infant/child health outcomes (e.g. anogenital distance, age at menarche)?
- Does contraceptive use during breastfeeding have an impact on [any; select one] maternal/infant health outcomes (e.g. exclusive breastfeeding rate, infant weight gain)?
- Does delivery at home cause an increase in maternal or infant morbidity or mortality?
- Do low levels of prenatal alcohol exposure cause a decrease in child cognition?
- Does exposure to air pollution cause [any; select one] adverse reproductive outcomes (e.g. polycystic ovarian syndrome, miscarriage)?
- Does in utero exposure to an endocrine disrupting compound [any; select one] increase the risk of [any; select one] adverse male or female reproductive outcomes (e.g., menstrual cycle dysfunction, testicular dysgenesis syndrome)?
- Does testosterone supplementation for men cause [any; select one] adverse reproductive outcomes (e.g. reduced semen quality)?
- Do dietary factors (e.g., specific micronutrients or foods) cause [any; select one] adverse reproductive outcomes (e.g. endometriosis, anovulatory infertility)?
- ***You may also pick your own topic and submit it for approval***

Week 1	January 11
Topics	Introduction & Overview – what is reproductive epidemiology? Review of reproductive physiology, gametogenesis Repro epi vs. chronic disease epi
HW Due Next Class	<ul style="list-style-type: none"> • Introduce yourself to the class: Post a photo of yourself on the discussion board and describe your background and interests • Read Wilcox text: chapters 1, 2, and 5 • Read “How to read epi studies” and review the Oral Presentation Guidelines (under the Oral Presentation Assignment) • Read Steiner et al. 1995 • Optional/Recommended: “Life’s Greatest Miracles” (NOVA documentary, 53 min): http://www.pbs.org/wgbh/nova/body/life-greatest-miracle.html

Week 2	January 18
Topics	Study design issues in reproductive epidemiology Start discussion of Steiner et al.

HW Due Next Class	<ul style="list-style-type: none"> • Write critique of Steiner et al. (2 - 3 pages) using the “How to read epidemiologic literature” outline. Due January 25. • Read Wilcox chapters 10, 11 and 16 • Think about student presentation topics (post on discussion board)
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Week 3	January 25
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Topics	Review Steiner et al. critique Epidemiology of pregnancy loss
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HW Due Next Class	<ul style="list-style-type: none"> • Read Vitonis et al. and be prepared to discuss • Read Wilcox chapters 8 <p>Required readings:</p> <ul style="list-style-type: none"> • Hoffman SR, Farland LV, Doll KM, Nicholson WK, Wright MA, Robinson WR. The epidemiology of gynaecologic health: contemporary opportunities and challenges. <i>J Epidemiol Community Health.</i> 2020;jech-2019-213149. • Lizneva D, Suturina L, Walker W, Brakta S, Gavrilova-Jordan L, Azziz R. Criteria, prevalence, and phenotypes of polycystic ovary syndrome. <i>Fertil Steril.</i> 2016 Jul;106(1):6-15. • Shafrir AL, Farland LV, Shah DK, Harris HR, Kvaskoff M, Zondervan K, Missmer SA. Risk for and consequences of endometriosis: A critical epidemiologic review. <i>Best Pract Res Clin Obstet Gynaecol.</i> 2018 Aug;51:1-15. <p>Optional reading:</p> <ul style="list-style-type: none"> • He Y, Tian J, Blizzard L, Oddy WH, Dwyer T, Bazzano LA, Hickey M, Harville EW, Venn AJ. Associations of childhood adiposity with menstrual irregularity and polycystic ovary syndrome in adulthood: the Childhood Determinants of Adult Health Study and the Bogalusa Heart Study. <i>Hum Reprod.</i> 2020 May 1;35(5):1185-1198.
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Week 4	February 1
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Topics	Gynecological disorders, including polycystic ovary syndrome (PCOS) and endometriosis Methodologic issues in repro epi Begin discussion of Vitonis et. al
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HW Due Next Class	<ul style="list-style-type: none"> • Read Wilcox Chapters 9 and 17 • Write critique of Vitonis et al. (2 - 3 pages). Due February 8. <p>Required reading:</p> <ul style="list-style-type: none"> • Jacobson MH, Chin HB, Mertens AC, Spencer JB, Fothergill A, Howards PP. "Research on Infertility: Definition Makes a Difference" Revisited. Am J Epidemiol. 2018 Feb 1;187(2):337-346. <p>Optional reading:</p> <ul style="list-style-type: none"> • Marchbanks PA, Peterson HB, Rubin GL, Wingo PA. Research on infertility: definition makes a difference. The Cancer and Steroid Hormone Study Group. Am J Epidemiol. 1989 Aug;130(2):259-67.
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Week 5	February 8
Topics	Review Vitonis et al. critique Epidemiology of infertility and menstrual cycle function
HW Due Next Class	<ul style="list-style-type: none"> • Watch NIEHS: "Our Chemical Lives" https://www.niehs.nih.gov/health/topics/agents/endocrine/ • Read Buck Louis et al. and be prepared to discuss <p>Required reading:</p> <ul style="list-style-type: none"> • Hauser et al. Urinary Phthalate Metabolite Concentrations and Reproductive Outcomes among Women Undergoing in Vitro Fertilization: Results from the EARTH Study. Environ Health Perspect. 124(6): 831-9; 2016.

Week 6	February 15
Topics	Case Study: Endocrine disrupting chemicals and fertility Begin discussion of Buck Louis et al.
HW Due Next Class	<ul style="list-style-type: none"> • Write critique of Buck Louis et al. (2 - 3 pages) Due February 22. • Susser M. Causal Thinking in the Health Sciences. Chapter 11 – Criteria of Judgment. Oxford University Press, 1973

Week 7	February 22
Topics	Review Buck Louis et al. critique Discussion of Causal Judgement
HW Due Next Class	<ul style="list-style-type: none"> • Post your oral presentation topic • Read Wilcox Chapter 20 • UNDARK ARTICLE: https://undark.org/2017/12/18/pbb-michigan-epigenetics/

Week 8	March 1
Topics	Guest Lecture: Dr. Michele Marcus, Professor in Epidemiology and Environmental Health Introduction to the PBB Cohort & community engagement in research

HW Due Next Class	<p>TAKE HOME MIDTERM (open book but work independently)</p> <ul style="list-style-type: none"> • Read Wilcox Chapter 18 <p>Required reading:</p> <ul style="list-style-type: none"> • Geller et al. 2015 Comparing Two Review Processes for Determination of Preventability of Maternal Mortality in Illinois • MacDorman et al. 2016 Recent Increases in the U.S. Maternal Mortality Rate Disentangling Trends From Measurement Issues • Petersen EE, Davis NL, Goodman D, Cox S, Syverson C, Seed K, Shapiro-Mendoza C, Callaghan WM, Barfield W. Racial/ethnic disparities in pregnancy-related deaths—United States, 2007–2016. Morbidity and Mortality Weekly Report. 2019 Sep 6;68(35):762. <p>Optional reading:</p> <ul style="list-style-type: none"> • St Pierre et al. 2017 Challenges and Opportunities in Identifying, Reviewing, and Preventing Maternal Deaths
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March 8th – No Class – Spring Break

Week 9	March 15
Topics	<p>Guest lecture: Dr. Michael Kramer, Director of Emory Maternal and Child Health Center of Excellence Maternal Mortality</p>
HW Due Next Class	<ul style="list-style-type: none"> • Post your oral presentation topic and two articles on the discussion board for approval • Read Wilcox Chapter 3 <p>Required reading:</p> <ul style="list-style-type: none"> • Potter JE, Stevenson AJ, Coleman-Minahan K, Hopkins K, White K, Baum SE, Grossman D. Challenging unintended pregnancy as an indicator of reproductive autonomy. Contraception. 2019;100(1):1-4 • Kost K, Zolna M. Challenging unintended pregnancy as an indicator of reproductive autonomy: a response. Contraception. 2019 Jul; 100(1):5-9 • Guttmacher Institute. Unintended Pregnancy in the United States. • Guttmacher Institute. Contraceptive Use in the United States. • National Academies of Sciences, Engineering, and Medicine. The Safety and Quality of Abortion Care in the United States. Washington, DC: The National Academies Press; 2018: SUMMARY PAGES 1-16. <p>Optional/Recommended reading</p> <ul style="list-style-type: none"> • Foster DG, Biggs MA, Ralph L, Gerdtts C, Roberts SCM, Glymour MA. Socioeconomic Outcomes of Women Who Receive and Women Who Are Denied Wanted Abortions in the United States. Am J Public Health 2018; 108(3):407-413. • Jones RK, Jerman J. Population Group Abortion Rates and Lifetime Incidence of Abortion: United States, 2008-2014. Am J Public Health 2017; 107(12):1904-1909.

	<ul style="list-style-type: none"> • Birgisson NE, Zhao Q, Secura GM, Madden T, Peipert JF. Preventing Unintended Pregnancy: The Contraceptive Choice Project. J Women's Health 2015; 24(5):349-53. • Kost K. Unintended Pregnancy Rates at the State Level: Estimates for 2010 and Trends Since 2002. New York: Guttmacher Institute; 2015: 1-19.
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Week 10	March 22
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Topics	<p>Guest Lecture: Dr. Subarsi Narasimhan, Assistant Professor in Global Health and Affiliated Faculty at The Emory Center for Reproductive Health Research in the Southeast (RISE) Contraceptive efficacy and unintended pregnancy</p>
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HW Due Next Class	<ul style="list-style-type: none"> • Read Wilcox Chapter 19 <p>Required readings:</p> <ul style="list-style-type: none"> • Johnson JD, Louis JM. Does race or ethnicity play a role in the origin, pathophysiology, and outcomes of preeclampsia? An expert review of the literature. American journal of obstetrics and gynecology. 2020 Jul 24. • Ananth CV, Brandt JS, Hill J, Graham HL, Grover S, Schuster M, Patrick HS, Joseph KS. Historical and Recent Changes in Maternal Mortality Due to Hypertensive Disorders in the United States, 1979 to 2018. Hypertension. 2021 Nov;78(5):1414-22. <p>Optional/Recommended reading</p> <ul style="list-style-type: none"> • Wenger NK, Arnold A, Bairey Merz CN, Cooper-DeHoff RM, Ferdinand KC, Fleg JL, Gulati M, Isiadinso I, Itchhaporia D, Light-McGroary K, Lindley KJ. Hypertension across a woman's life cycle. Journal of the American College of Cardiology. 2018 Apr 24;71(16):1797-813. • Garovic VD, Dechend R, Easterling T, Karumanchi SA, McMurtry Baird S, Magee LA, Rana S, Vermont JV, August P. Hypertension in pregnancy: diagnosis, blood pressure goals, and pharmacotherapy: a scientific statement from the American Heart Association. Hypertension. 2022 Feb;79(2):e21-41.
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Week 11	March 29
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Topics	<p>Guest lecture: Dr. Sheree Boulet, Assistant Professor in Obstetrics and Gynecology at Emory Medical School Hypertensive disorders of pregnancy, including burden, disparities, and need for a health equity approach</p>
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HW Due Next Class	<ul style="list-style-type: none"> • Select a repro epi outcome and a source of data to study it. • Read Wilcox Chapters 4, 12, and 14 <p>Required Reading</p> <ul style="list-style-type: none"> • Handley SC, Mullin AM, Elovitz MA, Gerson KD, Montoya-Williams D, Lorch SA, Burris HH. Changes in Preterm Birth Phenotypes and Stillbirth at 2 Philadelphia Hospitals During the SARS-CoV-2 Pandemic, March-June 2020. JAMA. 2021 Jan 5;325(1):87-89.
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	<ul style="list-style-type: none"> • Khalil A, von Dadelszen P, Draycott T, Ugwumadu A, O'Brien P, Magee L. Change in the Incidence of Stillbirth and Preterm Delivery During the COVID-19 Pandemic. JAMA. 2020 Jul 10;324(7):705–6. • Beigi RH, Krubiner C, Jamieson DJ, Lyster AD, Hughes B, Riley L, Faden R, Karron R. The need for inclusion of pregnant women in COVID-19 vaccine trials. Vaccine. 2021 Feb 5;39(6):868-870. • Gray KJ, Bordt EA, Atyeo C, Deriso E, Akinwunmi B, Young N, Medina Baez A, Shook LL, Cvrk D, James K, De Guzman R, Brigida S, Diouf K, Goldfarb I, Bebell LM, Yonker LM, Fasano A, Rabi SA, Elovitz MA, Alter G, Edlow AG. COVID-19 vaccine response in pregnant and lactating women: a cohort study. Am J Obstet Gynecol. 2021 Mar 24:S0002-9378(21)00187-3.
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Week 12	April 5
Topics	<p>Current issues in repro epi (COVID-19 & COVID-19 vaccinations during pregnancy)</p> <p>Data sources in repro epi</p> <p>Discussion of presentations</p>

Week 13	April 12
Topics	Student Presentations!

Week 14	April 19
Topics	Student Presentations!

Week 15	April 26
Topics	Student Presentations!