

Spring semester

Perinatal and Pediatric epidemiology

(BE-7085/PH-7085, 3 credit hours)

Division of Epidemiology, Department of Environmental Health,
University of Cincinnati College of Medicine

<u>Class sessions:</u>	To be determined, will be continuous 3 hours in one weekday
<u>Classroom:</u>	To be determined, in the Kettering Laboratory Complex
<u>Textbook:</u>	Reproductive and Perinatal Epidemiology, edited by Germaine M. Buck Louis and Robert Platt, Oxford University Press, 2011 Fertility and Pregnancy, Allen J. Wilcox, Oxford University Press, 2010
<u>Course Director:</u>	Dr. Aimin Chen, Division of Epidemiology, Department of Environmental Health, Kettering 141, aimin.chen@uc.edu

Course description

Perinatal and Pediatric Epidemiology (PPE) is a branch of epidemiology studying the risk factors that may affect human reproduction, pregnancy, birth outcomes, fetal and child development, and maternal and child health conditions. PPE utilizes surveillance, case-control study, cohort study, clinical trial, and community prevention trial to provide data regarding infertility, pregnancy loss, stillbirth, pregnancy complications, adverse birth outcomes, infant and child disorders to guide prevention efforts. The PPE course will provide an introduction to perinatal and pediatric health outcomes from a population viewpoint, describe major risk factors identified, summarize research progress and limitations, and stimulate students to identify unsolved questions and design new studies in the relevant areas.

Learning Objectives

The students will be able to achieve the following learning objectives and competencies at the end of the course:

- 1) Understand human reproduction and child development physiology as the basis for PPE studies
- 2) Develop knowledge to use PPE terminology to define major health indicators of perinatal and pediatric health

- 3) Demonstrate the grasp of the history in the study of perinatal and pediatric outcomes
- 4) Identify leading health burdens in the area of PPE in local, national, and global settings
- 5) Describe major preventable risk factors of prevalent health problems in maternal and child health
- 6) Summarize and criticize literature in a selected topic in PPE
- 7) Design original studies to investigate epidemiologic associations and benefit maternal and child health
- 8) Demonstrate the ability to use life course epidemiology approach in the study of pregnancy and child health outcomes
- 9) Describe health disparities in PPE and the interventions to bridging the gaps
- 10) Understand the vulnerability of pregnant women and children to the environment and demonstrate knowledge in protecting them in research and public health practices
- 11) Demonstrate the capability to communicate PPE findings to lay and professional audiences
- 12) Know public health agencies involved in maternal and child health for surveillance, etiology research, intervention, and assessment
- 13) Understand the importance of clinical care (prenatal, delivery, and well-child care), screening, and early intervention in maternal and child health
- 14) Develop knowledge of new research methods, including –omics approach, in PPE investigations
- 15) Develop the ability to meet statistical challenges in PPE investigations

Course schedule

Week	Date	Topic	Reading	Instructor
1		Introduction to PPE Physiology of placenta, fetal and child development		
2		Fertility and infertility		
3		Pregnancy loss and stillbirth Pregnancy complications		
4		Gestational length and preterm birth		
5		Fetal growth and birth weight		
6		Birth defects *Student research and presentation topic due		

7		Birth cohorts in PPE		
8		Infant morbidity and mortality		
9		Spring break		
10		Epigenetics in fetal and child development		
11		Neurobehavioral disorders		
12		Development of obesity and metabolic disorders		
13		Development of asthma and allergy		
14		Student presentations 1	30 min each student, cover 1 topic of PPE	
15		Student presentations 2 *Student research topic and new study design due	30 min each student, cover 1 topic of PPE	

Suggested student presentation topics

1. Assisted reproductive technology	2. Infectious disease during pregnancy
3. Tobacco use during pregnancy and consequences	4. Alcohol use during pregnancy
5. Substance use during pregnancy	6. Social determinants of perinatal and pediatric health
7. Prenatal and postnatal stress	8. Radioactive exposures
9. Medication use during pregnancy	10. Physical activity during pregnancy
11. Nutrition during pregnancy	12. Vital statistics and data sources for PPE investigations: strengths and limitations
13. Global maternal and child health	14. Puberty development
15. Pregnancy with preexisting medical conditions	16. Multigenerational effect as an interplay of gene and environment
17. Surveillance of perinatal and pediatric health indicators	18. Microbiome
19. Human placenta project	20. Childhood injuries
21. Childhood mental health	22. Childhood autoimmune diseases
23. Childhood cancers	24. Additional topics

Prerequisite

Introduction to Epidemiology (BE-7076) or Epidemiology for Public Health (PH-7030) is needed as a prerequisite. Graduate Standing. The course is open to Department of Environmental Health degree program students including MS and PhD Epidemiology & Biostatistics, MS in Clinical & Translational Research, and Master of Public Health (MPH). The course is also open to other students in the University of Cincinnati and Cincinnati Children’s Hospital Medical Center.

Learning approach

The instructors will facilitate learning through lectures, discussion, and other interactive classroom activities. Students are required to present a PPE research topic independently after homework on the topic.

Grading

	Weight towards final grade
Class attendance	5%
Class discussion	20%
Research topic summary and new study design	50%
Final Presentation	25%

- Class attendance requires participation in the lectures and discussion with no more than 3 missing in the entire semester.
- Class discussion requires active thinking and discussion of assigned reading materials and interaction with faculty and peer students.
- Research topic summary and new study design is intended to assess a student’s understanding of PPE literature in a selected topic area, summarizing research topic for science and epidemiology, designing a new epidemiologic study to advance the field of investigation. It requires 10-12 pages (double space, font size 12) to survey the field and propose new research direction. Bibliography does not count to the page requirement. Any PPE topics are allowed, however, it is recommended to select cutting edge research topics and unsolved research questions. Do not propose a meta-analysis or systematic review. The new study design should be detailed regarding methods, exposure, outcome, confounders, and statistical analysis. The grading will be based on:
 - Literature review and previous findings (10 points);
 - Limitations of previous studies (10 points);
 - Significance and implication of the new study (10 points);
 - Methodological rigor of the new study design including strengths and limitations (15 points);
 - Innovation (5 points).

- Final presentation is for students to present their research topic summary and new study design to the class for feedbacks and comments. The presentation will be 25 min plus 5 min Q&As. The grading will be based on:
 - Clarity of presentation (5 points);
 - Depth of knowledge in the topic area (10 points);
 - Scientific impact of the new study design (10 points).

Grade Guidelines

A: 93-100

A-: 90-92

B+: 87-89

B: 83-86

B-: 80-82

C+: 77-79

C: 73-76

C-: 70-72

D+: 67-69

D: 63-66

D-: 60-62

F: <60

http://www.uc.edu/registrar/faculty_resources/grading_scales.html#grad

Please check “Graduate” for relative GPA points.