

**DEPARTMENT OF EPIDEMIOLOGY  
TULANE SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE**

**Syllabus  
Reproductive Epidemiology (EPID 648)  
Spring 2005**

Xu Xiong, MD, DrPH  
Associate Professor of Epidemiology  
Tidewater Building, Suite 2022  
Phone: (504) 988-1379, Fax: (504) 988-1568, Email: [xxiong@tulane.edu](mailto:xxiong@tulane.edu)

Guest Lecturers:

Michael C. Henson, PhD, Associate Professor and Director of Research, Dept. of Obstetrics and Gynecology, School of Medicine

Gabriella Pridjian, MD, Professor and Chairman, Dept. of Obstetrics & Gynecology, School of Medicine

Pierre Buekens, MD, MPH, PhD, Professor and Dean, SPHTM

**A. Course Outline:**

This course provides students analytical skills necessary to conduct epidemiological studies in reproductive health in human populations. Reproductive epidemiology covers broad reproductive health issues from the pre-conception, prenatal, delivery and post-natal periods and emphasizes health issues affecting both women and infants. Relevant methodological, clinical, policy and programmatic issues will be presented with practical illustrations from domestic and international settings. Students will be able to design a reproductive health epidemiology study, discuss relevant methodological issues in reproductive health epidemiology studies, and apply reproductive health data to improve reproductive programs and policy.

**B. Course Objectives:**

By the completion of the course, the students will be able to:

- Describe the key reproductive health indicators, both morbidity and mortality.
- Discuss key epidemiologic study design and measurement issues in reproductive health.
- Describe the sources of data used in reproductive epidemiology and the strengths and weaknesses of the different data sources.
- Describe different methodologies used to collect data and conduct analysis on reproductive epidemiology topics.
- Discuss with key study design and measurement issues in topics such as infertility, birth defects and early reproductive loss, pregnancy-induced hypertension, and low birth weight.
- Describe relationships between lifestyle, occupational factors and reproductive outcomes.

- Describe the key variables for the evaluation of prenatal care.
- Describe the common pregnancy-induced disorders (e.g., anemia, pregnancy-induced hypertension, gestational diabetes mellitus) and their prevalence, risk factors, maternal and infant outcomes.
- Describe the epidemiology of preterm birth and understand key differences in the conducting and interpretation of results of studies of preterm birth, intrauterine growth restriction and low birth weight
- Describe the epidemiology of stillbirth/fetal death, early neonatal death, infant mortality, perinatal mortality and maternal mortality.
- Discuss key evidence-based medicine approaches in reproductive health (unique methodological and ethics features of randomized clinical trials, systematic review or meta-analysis, Cochrane Collaboration).
- Discuss key evidence-based global health issues in reproductive health, especially in developing countries.
- Discuss the concept and public health significance of possible fetal or pregnancy origins of some health problems in later life (e.g., childhood developmental disabilities/obesity, hypertension, type II diabetes, and cardiovascular disease).
- Discuss the public health significance of major reproductive and perinatal problems and the importance of epidemiologic studies in developing prevention strategies.

### **C. Prerequisite:**

Students must have completed introductory epidemiology and biostatistics courses (EPID 603, BIOS 603).

### **D. Course Format:**

In-class lectures, and directed group discussions of course materials and projects. Students will be expected to read assigned readings and be prepared to discuss them. Students will be expected to select one specific topic and analyze existing perinatal data and write abstract and present their individual project in the class. Students will be expected to work in group to develop a research proposal and write a brief grant application for the proposal.

### **E. Course evaluation:**

Evaluation will be based on:

- Classroom participation: Pass or fail
- Journal article critique: 20%
- Secondary data analysis project: 40%
- Proposal for study of reproductive epidemiology 40%

The approximate guidelines for the transformation of percentages into grade points for this course are:

A	>93%
A-	85-93%
B+	80-85%
B	75-80%

B-	65-75%
C+	55-65%
C	50-55%

**F. Textbooks: (None)**

The course materials may be selected from the following lists of books on Reproductive and Perinatal Epidemiology:

- Kiely M ed. Reproductive and Perinatal Epidemiology. CRC Press, Boca Raton, 1991.
- Kline J et al. Conception to Birth, Epidemiology of Prenatal Development. Oxford, 1989
- Weinberg, CR and Wilcox, AJ. Reproductive Epidemiology. In Rothman, KJ and Greenland, S: Modern Epidemiology (2<sup>nd</sup> Edition), Lippincott-Raven, 1998, pages 585-608

**G. Reading materials:**

Reading materials and handouts will be delivered to the students before each section including each section course syllabus and 2-3 suggested readings

**H. Course Schedule:**

Class Date	Topics	Contents
Section 1 Jan. 11	Introduction	<ul style="list-style-type: none"> <li>• Syllabus</li> <li>• Basic Concepts in Reproductive Health and Reproductive Epidemiology</li> <li>• Overviews of Key Reproductive Health Indices (Glossary)</li> <li>• Reproductive Epidemiology/Perinatal Epidemiology/Maternal and Child Health</li> </ul>
Section 2 Jan. 18	Study Design, Data Sources and Data Use	<ul style="list-style-type: none"> <li>• Overview of Basic Epidemiologic Study Designs</li> <li>• Reproductive Data Sources – Strengths and Limitations</li> </ul>
Section 3 Jan. 25	Basic Biology of Human Reproduction (Dr. Michael Henson, Director of Perinatal Research, Dept. Ob/Gyn)	<ul style="list-style-type: none"> <li>• Menstrual cycle/Ovulation/Fertilization</li> <li>• Pregnancy and Conceptus Development</li> <li>• Endocrinology of the Maternal-Fetoplacental Unit</li> <li>• Regulation of lactation</li> </ul>
Section 4 Feb. 1	Conception/Early Pregnancy	<ul style="list-style-type: none"> <li>• Infertility/ Assisted Reproductive Technologies /Multiple Pregnancies</li> <li>• Early Pregnancy Loss/abortions</li> <li>• Unintended Pregnancy/Teen Pregnancy</li> <li>• Delayed Childbearing</li> </ul>
Section 5 Feb. 15	Epidemiology of Birth Defects	<ul style="list-style-type: none"> <li>• Cause of Abnormal Development</li> <li>• Principle of Teratology: Genetics and Birth Defects</li> </ul>

		<ul style="list-style-type: none"> <li>• Major Congenital Malformation and Their Epidemiology and Etiology</li> <li>• Prevention: Folic Acid and Neural Tube Defects (Randomized Controlled Trial)</li> </ul>
Section 6 Feb. 22	Prenatal Care	<ul style="list-style-type: none"> <li>• Measurement of Prenatal Care</li> <li>• Prenatal Care and Pregnancy Outcomes</li> <li>• Barriers of Prenatal Care (esp. in Developing Countries)</li> </ul>
Section 7 Mar. 1	Reproductive Risk Assessment	<ul style="list-style-type: none"> <li>• Major Issues in Exposure Assessment</li> <li>• Lifestyle Factors and Pregnancy Outcomes</li> <li>• Occupational and Environmental Reproductive Hazard</li> <li>• Infections and Pregnancy Outcomes</li> <li>• Prenatal/Obstetrics Risk Scores</li> </ul>
Section 8 Mar. 8	Prenatal Screening (Dr. G. Pridjian, Professor & Chair, Dept. Ob/Gyn)	<ul style="list-style-type: none"> <li>• Screening of High Risk Pregnancy &amp; Genetic Disorders</li> <li>• Prenatal Ultrasound Screening: RCTs</li> </ul>
Section 9 Mar. 15	Pregnancy-induced Disorders	<ul style="list-style-type: none"> <li>• Anemia: Prevalence &amp; Iron Supplements</li> <li>• Gestational Diabetes Mellitus: Screening &amp; Perinatal Outcomes</li> <li>• Hypertensive Disorders in Pregnancy</li> </ul>
Section 11 Mar. 29	Epidemiologic Aspects of Preterm Birth and Low Birth Weight	<ul style="list-style-type: none"> <li>• Preterm Birth, Fetal Growth Restriction &amp; Low Birth Weight</li> <li>• Time Trends in Preterm Birth and Low Birth Weight</li> <li>• Disparities (Race, SES) and Low Birth Weight</li> <li>• Prevention of Preterm Birth</li> </ul>
Section 12 Apr. 5	Perinatal Mortality and Infant Mortality	<ul style="list-style-type: none"> <li>• Fetal deaths, Stillbirths, Neonatal Deaths, and Perinatal Deaths</li> <li>• Birth Weight and Perinatal Mortality</li> <li>• Methodological Issues</li> </ul>
Section 13 Apr. 12	Evidence-Based Medicine in Reproductive Health	<ul style="list-style-type: none"> <li>• Evidence-Based Medicine</li> <li>• Methodological and Ethics Issues of Randomized Controlled Trials</li> <li>• Systematic Review and Meta-Analysis</li> <li>• Cochrane Collaboration</li> </ul>
Section 14 Apr. 19	Evidence-Based Global Health  (Dr. Pierre Buekens, Dean & Professor, SPHTM)	<ul style="list-style-type: none"> <li>• Evidence-Based Global Health: Maternal and Infant Mortality in Developing Countries</li> </ul>
Section 15	Long-Term Impacts of Perinatal Health	<ul style="list-style-type: none"> <li>• Fetal Origins of Adult Disease Hypothesis: Strengths and Limitations &amp; Public Health</li> </ul>

Apr. 26		Implications
Section 16	Oral Presentations	
May 3		