

**Extended MPH Degree Program
School of Public Health
Department of Epidemiology
University of Washington**

Epidemiology 521

Epidemiology of Maternal and Child Health Problems

Winter / Spring, 2010

Instructor:

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I. COURSE DESCRIPTION

EXDP Epidemiology 521: “Epidemiology of Maternal and Child Health Problems” addresses maternal and child health issues from an epidemiological perspective. The course focuses on three periods of growth and development:

- 1) the *prenatal* period, including the etiology of pregnancy outcomes, prenatal care, and maternal complications;
- 2) the *perinatal - neonatal* period, addressing preterm birth and low birth weight; fetal, neonatal and infant mortality; and congenital malformations;
- 3) *childhood*, in which we will examine three specific epidemiologic problems:
 - the infant and child consequences of prenatal substance exposure
 - developmental disabilities
 - childhood injury.

This course will not attempt to provide a comprehensive review of each of the topic areas, but will focus on the epidemiological issues and challenges, as well as major epidemiological achievements in these various areas. The course will provide the student with opportunities to apply epidemiologic methodology and principles

In addition to addressing some of the epidemiological issues associated with maternal and child health, two current themes of discussion and debate will be incorporated into the syllabus and assignments throughout the course. These are:

- 1) the role of socio-economic factors in determining pregnancy and childhood outcomes of at-risk populations;
- 2) understanding the relationship between racial / ethnic identity and disparities in maternal and child health.

II. COURSE OBJECTIVES

Students completing this course will be able to:

- Identify recent secular trends in major problems of maternal and child health, e.g. low birth weight / prematurity; infant, child and maternal mortality and morbidity; congenital malformations.
- Recognize the relative importance of intrinsic (i.e. host) factors and extrinsic factors (e.g. infections, drugs, environmental and/or cultural influences) in maternal and child health problems.
- Analyze sociodemographic risk factors, and the underlying biological and behavioral mechanisms, of the major problems of maternal and child health.
- Discuss major controversies in the epidemiology of maternal and child health issues.
- Comprehend and apply epidemiologic methodology and principles within the context of maternal and child health.
- Use the knowledge and skills necessary for critical analysis of published research articles in order to evaluate validity and clinical relevance.

III. PRE-REQUISITES

In this course, epidemiologic methods and procedures are applied to maternal and child health conditions and problems. Students who enroll in this course are required to have previous education or training in epidemiology. Knowledge of biostatistics is not required but familiarity with basic statistics is recommended.

IV. COURSE ORGANIZATION

A. Time period and credit hours

This course is offered for 3 credits during the Winter & Spring Quarters of each academic year. If a student is unable to fulfill the course requirements within the stated schedule, the student must contact the instructor to establish a new deadline. Credits will be granted upon completion of all assignments.

B. Course content and materials

There is no assigned text book for this course. The course materials are derived from journal articles, text books and data sources. While an effort has been made to include current information, some of the readings represent older literature in order to provide an historical perspective, or to expose the students to "classic" works in the field.

The assigned readings include review articles that are provided as reference or background information for a given topic, and publications presenting epidemiological studies or discussion of issues in MCH research. **It is not expected that all students will read every article in depth or detail.** Some articles will be emphasized for completion of the assignments or to highlight an aspect of epidemiologic methodology. Other readings are offered to allow students to explore a topic in greater depth when it is of interest or relevant to his/her own practice area.

C. Assignments

Completion of 10 written assignments is required for this course. Two of the 10 assignments will include an “on-line” discussion among students.

The assignments are of two different types:

- 1) Data-based: Some of the assignments require interpretation of data. The data is provided in tables, figures, or graphs. The student is asked to use the data to determine etiologies of MCH conditions and/or to evaluate distributions and trends.
- 2) Analytical: Using assigned reading materials, the student will critically assess and synthesize the information to respond to questions regarding policy or programs.

Both types of assignments require the student to demonstrate individual thought and organization. The assignments are *not* seeking a re-statement or summary of the given reading materials.

Assignments should be typewritten and double-spaced. **Assignments should be sent as email attachments to: marwill@u.washington.edu. Please include your last name as part of the file name for email attachments.**

For your long-range planning, the due dates for assignments are: **January 19th, February 1st, February 16th – February 23rd, March 8th, March 22nd, April 5th, April 19th, May 3rd, May 17th, June 1st – June 8th.**

D. Student evaluation and grading

Student evaluation will be based on the written assignments and participation in on-line discussions.. Assignments are to be submitted according to the course schedule. Each assignment will be given a maximum of 10 points, for a total of 100 points over the full course period. Points will be deducted if assignments are received after the due date. If a student anticipates a problem in completing any assignment because of personal or professional conflicts, he/she should discuss this with the instructor in advance of the assignment due date.

E. Course evaluation

Students will be given a questionnaire for evaluating the course at the end of the quarter. The questionnaire will be completed anonymously and returned to the Extended Degree Program. The instructor will not review the evaluation forms until after course grades have been assigned. Student responses on the questionnaire will be used to modify and improve the course content and requirements and will have no impact on the students' grades.

V. INSTRUCTOR

Dr. Williams is a Senior Lecturer in the Departments of Epidemiology and Rehabilitation Medicine (Adjunct). She is a member of the faculty of the Maternal and Child Health Program (MCHP) in the School of Public Health and Community Medicine. Dr. Williams's primary research interests include: early identification of neuromotor disability in high-risk infants; etiology of cerebral palsy in low birthweight infants; developmental consequences of *in utero* exposure to medications or illicit substances; pediatric injury prevention. She has a clinical background in pediatric physical therapy and currently provides diagnostic assessment and clinical teaching within the High Risk Infant Follow-up Clinic at the Center on Human Development and Disability (CHDD).

The most immediate and reliable method of communication is email marwill@u.washington.edu. If you want to telephone, the best number to use is my MCH office: (206) 685-0481; alternatively, at the CHDD: (206) 543-2206.

UNIT I

**DEFINITIONS, DATA SOURCES, TERMINOLOGY, ANALYSES
IN MATERNAL AND CHILD HEALTH EPIDEMIOLOGY****Objectives:**

1. To be familiar with the various sources of population-based data used in maternal and child epidemiology.
2. To be knowledgeable about definitions and classifications that are relevant to maternal and child health.
3. To understand the terminology and procedures used in critical analysis and design of epidemiological studies.
4. To examine issues of analysis and interpretation that are particularly relevant to MCH epidemiology.

UNIT 2

**ETIOLOGIC MODEL OF THE
EPIDEMIOLOGY OF PREGNANCY OUTCOMES****Objectives:**

1. To gain an understanding of the many factors, both intrinsic to the mother and fetus and extrinsic (environmental), which impact the course and outcome of a pregnancy.
2. To be able to differentiate between genetic and non-genetic influences on pregnancy and developmental outcome.
3. To understand how race/ethnicity and socioeconomic status interact in their relationship to pregnancy and child developmental outcome.
4. To recognize the limitations and problems of racial or ethnic identifications.

UNIT 3

PRENATAL CARE**Objectives:**

1. To become acquainted with current knowledge and opinions regarding the importance of prenatal care relative to health of pregnant mothers and their offspring, and efforts to reduce low birth weight and other adverse outcomes.
2. To learn the different techniques and approaches to measurement of prenatal care.
3. To evaluate the cost-effectiveness of prenatal care as a means of improving pregnancy outcome in relation to socioeconomic status and racial/ethnicity identification.

UNIT 4

MATERNAL COMPLICATIONS DURING PREGNANCY**Objectives:**

1. To become acquainted with the problems and risks associated with pregnancy including infection, nutritional status, and disease transmission.
2. To understand how exposure to intrauterine infection can precipitate preterm delivery and, independently of preterm birth, can adversely impact the developmental outcome of the fetus.
3. To recognize the risks and consequences of maternal Vitamin D deficiency during pregnancy.

UNIT 5

**PREMATURITY, LOW BIRTH WEIGHT
AND
INTRAUTERINE GROWTH RETARDATION****Objectives:**

1. To recognize the secular trends associated with low birth weight (LBW) and preterm birth.
2. To understand the socio-demographic correlates of LBW and premature birth.
3. To identify particular challenges to epidemiologic research in this area, including determination of gestational age and the implications relative to studies of pregnancy and infant outcomes.

UNIT 6

**INFANT MORTALITY AND
SUDDEN INFANT DEATH SYNDROME****Objectives:**

1. To acquire a perspective on the secular trends in infant mortality relative to magnitude and etiology.
2. To become acquainted with the socio-demographic correlates of infant mortality.
3. To understand the relationship between ethnic/racial identity and infant mortality statistics.
4. To learn about the epidemiology of one of the major causes of infant mortality, sudden infant death syndrome (SIDS).

UNIT 7

CONGENITAL MALFORMATIONS**Objectives:**

1. To understand the epidemiological approach to understanding the etiology of congenital malformations.
2. To learn about the contributions of epidemiological research towards the prevention of neural tube defects (e.g. spina bifida, myelomeningocele).

UNIT 8

**DEVELOPMENTAL CONSEQUENCES OF
IN UTERO EXPOSURE TO ALCOHOL OR DRUGS****Objectives:**

1. To learn about the characteristics and patterns of maternal substance use during pregnancy and the developmental consequences for the exposed fetus.
2. To understand the relationship between prenatal substance exposure and childhood outcome as a multi-factorial problem, combining biological, sociological and environmental influences.
3. To appreciate the complexity of epidemiological study of the association between prenatal substance exposure and developmental outcome.
4. To learn about the contribution of epidemiological research to the diagnosis of fetal alcohol syndrome (FAS).

UNIT 9

CHILDHOOD MORBIDITY AND DISABILITY**Objectives:**

1. To become acquainted with different patterns of childhood morbidity.
2. To develop an understanding of the long-term consequences of adverse pregnancy outcomes, specifically premature birth / low birth weight.
3. To learn about the epidemiology of cerebral palsy and mental retardation.
4. To become aware of some of the epidemiological problems relative to specific conditions, e.g. autism, cerebral palsy.

UNIT 10

UNINTENTIONAL AND INTENTIONAL INJURY**Objectives:**

1. To recognize injury as a major contributor to childhood mortality and morbidity.
2. To learn about the variations in distribution of childhood injuries relative to age, gender, residence, and racial/ethnic characteristics.
3. To gain an appreciation for the unique aspects of *childhood* injury, and to recognize how they impact the epidemiology and prevention of injury in children differentially from adults.
4. To understand the concepts of a) levels of prevention, and b) the Haddon matrix in relation to childhood injury.