Epidemiology 822
Malaria and Other Vector-Borne Diseases
of Public Health Importance
Fall Term, 2012
3 Credit hours
Meetings: 3-6pm Thursdays
Rm. 2750 SPH 1

Instructor: Mark L. Wilson
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Pre-requisites: Students should have successfully completed Epid 602, Epid 605 or equivalent, EHS 513 or equivalent, and obtained permission of instructor.

Course philosophy: This seminar is designed to explore the epidemiology of malaria and other important vector-borne diseases that principally affect poor people living in tropical countries. Class sessions will include a brief didactic presentation of the key issues for that topic followed by a structured discussion of selected questions related to the readings for that meeting. Students are expected to be active and critical participants throughout the entire semester.

General objectives: Expand student's understanding of the diverse factors and complex interactions that affect the epidemiology of malaria and other important vector-borne diseases. Undertake critical evaluation of the mechanisms, processes, drivers and impacts of such diseases on people's health. Consider determinants of risk and options for prevention, as well as needed public health policies and actions.

Specific objectives:
Upon completion of the course, the student should be able to:

1. Characterize the principle biologic and epidemiologic components of vector-borne diseases in general, and of malaria and other arthropod-associated infections in particular.
2. Evaluate the many pathways influencing transmission dynamics, including those that involve genetic, immunologic, ecologic, economic and social factors.
3. Analyze options for surveillance, treatment, prevention and control involving vectors, parasites and human behavior.
4. Apply critical thinking and analytic methods aimed at research design and intervention strategies that are appropriate for the cultural and environmental conditions in different developing countries.

The intent is to present material in class that is aimed at helping students to comprehend, synthesize and analyze problems and processes in malaria epidemiology in particular, and more generally the special issues of vector-borne diseases (VBDs) in developing countries. Students should acquire a thorough knowledge of malaria, and of several other VBDs. Some of these diseases will be presented as examples in lectures, and others will be part of the readings.
Course Structure:
Some lecture and considerable discussion of assigned readings. Most sessions will be led by Professor Wilson and possibly one or two guest lecturers. During the last few class meetings, small groups of students will lead discussion of readings.

Forms of Evaluation:
Students are expected to participate in each session, read and critically evaluate assigned articles, ask and answer questions during presentations and discussions, and make a presentation at the end of the course on a topic that the instructor and student agrees upon. Grades (S/U) will be based on the instructor's evaluation of preparation, participation and final presentation.

Readings:
Articles to be read for each session's topic will be distributed via CTool throughout the course. They will be contemporary reviews or original research articles relevant to that week's topic. Students are expected to read the articles before each class meeting and be prepared to discuss questions and implications.

Standards of Academic Conduct:
The faculty of the School of Public Health expects the conduct of a student registered or taking courses in the school to be consistent with that of a professional person. Courtesy, honesty, and respect should be shown by students toward faculty, guest lecturers, administrative support staff, and fellow students. Similarly, students should expect faculty to treat them fairly, showing respect for their ideas and opinions and striving to help them achieve maximum benefits from their experience in the school.

Student academic misconduct includes behavior involving plagiarism, cheating, fabrication, falsification of records or official documents, intentional misuse of equipment or materials, and aiding and abetting the perpetration of such acts. The preparation of reports, papers, and examinations, assigned on an individual basis, must represent each student's own effort. Reference sources should be indicated clearly. The use of assistance from other students or aids of any kind during a written examination, except when the use of books or notes has been approved by an instructor, is a violation of the standard of academic conduct.
### Course Outline - Fall Term 2012

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<tr>
<th>Session</th>
<th>Leaders</th>
<th>Topic</th>
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<tr>
<td>Sept 6</td>
<td>MLW</td>
<td>Introduction: history and overview</td>
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<tr>
<td>13</td>
<td>MLW</td>
<td>VBD natural histories, epidemiologies: malaria, etc.</td>
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<tr>
<td>20</td>
<td>MLW</td>
<td>Plasmodium: pathogens, pathogenesis, disease, diagnosis,</td>
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<td>27</td>
<td>MA, KT</td>
<td>Host-parasite interactions, Host immunity, Treatment</td>
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<td>Oct 4</td>
<td>EW, JC</td>
<td>Coinfections, Role of nutrition</td>
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<td>11</td>
<td>CA, CH</td>
<td>Prevention/Control: human behavior, IPT, personal protection, vector abundance, contact patterns</td>
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<tr>
<td>18</td>
<td>LM, SP</td>
<td>Epidemiology: surveillance, epidemics, complex emergencies, research strategies</td>
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<tr>
<td>25</td>
<td>LT, TL</td>
<td>Environment and disease patterns; Socioeconomic factors and disease patterns</td>
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<td>Nov 1</td>
<td>KM, DI</td>
<td>Evolution of Resistance: Vector (insecticide) and Plasmodium (anti-microbial)</td>
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<td>8</td>
<td>MD, LT</td>
<td>Modeling malaria and other VBDs</td>
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<td>15</td>
<td>LM, TL</td>
<td>Intervention strategies: eradication, elimination, control, prevention</td>
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<td>X</td>
<td>XX</td>
<td>(Thanksgiving break)</td>
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<tr>
<td>29</td>
<td>SS, DI</td>
<td>Future interventions: Vaccines, Genetic modification of vectors, etc.</td>
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<td>Dec 6</td>
<td>AW, CH</td>
<td>Policy implications: financing, procurement, governments, NGOs, industry, etc.</td>
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**Websites of interest:**

- Multilateral Initiative on Malaria (MIM) [http://www.who.int/tdr/diseases/malaria/mim.htm](http://www.who.int/tdr/diseases/malaria/mim.htm)
- Roll Back Malaria (RBM) - WHO [http://www.rbm.who.int/](http://www.rbm.who.int/)
- Disease Control Priorities Project (DCPP) [http://www.dcp2.org/main/Home.html](http://www.dcp2.org/main/Home.html)
- Wellcome Trust [http://malaria.wellcome.ac.uk/](http://malaria.wellcome.ac.uk/)
- Mapping Malaria Risk in Africa (MARA) [http://vega.soi.city.ac.uk/~dk708/mara_arma.htm](http://vega.soi.city.ac.uk/~dk708/mara_arma.htm)
- Malaria Atlas Project (MAP) [http://www.map.ox.ac.uk/](http://www.map.ox.ac.uk/)