Course Syllabus

Environment, Climate and Infectious Disease
International Health (IH 591V)/ Environmental and Occupational Health (EOH 591E)
Fall 2003 - Mondays 11:00 a.m. – 12:50 p.m.

Course Director: Christine L. Moe, Ph.D.
Associate Professor
Department of International Health
Rollins School of Public Health
Emory University
1518 Clifton Rd, N.E., Room 760
Atlanta, GA USA 30322
Tel: +1 (404) 727-9257
Fax: +1 (404) 727-4590
Email: clmoe@sph.emory.edu

Teaching Assistant: Hannah Cluck
Department of International Health – Room 766
Tel: 404-727-5670
Email: hcluck@sph.emory.edu

Prerequisites: None

Credit Hours: 2 SPH

Enrollment: 25 students maximum

Time: Mondays, 11:00 a.m. – 12:50 p.m.

Course Material: The syllabus consists of journal articles and other reading material that will be available for individual students to copy for their own use. Most readings will be available on reserve at the Health Sciences (accessible via Blackboard), although guest lecturers may provide limited additional material in class. The recommended paperback for general information on specific infectious diseases is Control of Communicable Diseases, 17th Ed, 2000 (Chin, James, Ed.)

Objectives: This course will explore the role of the environment in the transmission of infectious diseases and the emergence of new pathogens. The course format will be a combination of lectures and classroom discussions guided by a series of questions. Topics include: basic principles of infectious disease
transmission, the influence of climate variation and change on infectious
diseases, the impact of deforestation and urbanization on emergence or re-
emergence of pathogens, infectious disease outbreaks associated with natural
disasters, ecological sanitation and infectious disease risks, and infectious
disease transmission in indoor environments. Many specific waterborne,
foodborne, vector-borne, and zoonotic infections will be used throughout the
lectures and discussions to illustrate general principles of environmental
transmission. Three lectures by CDC guest speakers will focus on important
vector-borne diseases: Chagas Disease, Schistosomiasis and Malaria. An
additional lecture by a CDC guest speaker will examine how natural
disasters affect occurrence of infectious diseases. The goal of the course is
to provide the student with a clear understanding of the relationship between
infectious agents, their hosts and the environmental conditions that affect
their interaction and to consider how this information can be used to design
effective control measures.

**Evaluation:**

There will be a mid-term take home exam that is a case study on a specific
infectious disease. The mid-term is comprised of selected readings and
questions provided by the instructor. Each student will also be required to
give an oral presentation on a selected topic and submit a final paper (5-7
pages) on the same topic. The presentation/paper should provide
background material on a specific infectious agent, how the agent is
transmitted, the role of specific environmental factors in disease transmission
and an assessment of available control measures or specific interventions.
Students will be evaluated on their understanding of the principles of
environment transmission of infectious diseases and their ability to critically
review and synthesize information from studies of their topic that are
described in the literature. (Please see attached evaluation guidelines.)

All exams are non-collaborative. All students are expected to follow the
student honor and conduct code guidelines. A copy of the entire
student honor and conduct code can be found online at the following
URL:  http://www.sph.emory.edu/studentservice/conductcode.html

Mid-term Exam:  20%
Oral Presentation: 40%
Final Paper: 40%
“Environment, Climate and Infectious Disease” Lecture and Reading Schedule:
Mondays, 11 am – 12:50 pm; Location: GCR 113

<table>
<thead>
<tr>
<th>Class One – September 8, 2003</th>
<th>Basic principles of environmental transmission of infectious agents</th>
<th>Christine L. Moe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This reading is available in portable document format (.pdf) on e-reserve at the Health Sciences Library. You can access the e-reserve site through Blackboard or at the following URL:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class Two – September 15, 2003</th>
<th>The effect of seasonality and climate on infectious diseases</th>
<th>Christine L. Moe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dowell, SF. Seasonal variation in host susceptibility and cycles of certain infectious diseases. <em>Emerg Inf Dis</em> 7(3):369-374</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class Three – September 22, 2003</th>
<th>The link between climate change and emerging and re-emerging pathogens</th>
<th>Christine L. Moe</th>
</tr>
</thead>
</table>
Class Four – September 29, 2003

(1) The impact of deforestation and urbanization on infectious disease;
(2) Megacities and sanitation

Readings:

Bradley, DJ. Environmental and health problems of developing countries. *Ciba Foundation Symposium* 1993 175:234-44


UN Human Settlement Programme. Water and Sanitation in the World’s Cities (excerpts)

---

Class Five – October 6, 2003

Applications of molecular genetics for Chagas disease surveillance and control

Readings:


---

There is no class on October 13, 2003, due to Fall Break at RSPH, Emory University. The mid-term take-home exam will be distributed in class on October 6 and will be due on October 20.

Class Six – October 20, 2003

Natural disasters and infectious diseases

Readings:

### Class Seven – October 27, 2003

**Monitoring urban water quality – class exercise**  
Students will be asked to select urban streams on campus or in their neighborhoods and collect a water sample to be analyzed in the laboratory.  

**Christine L. Moe**

| Readings: | A handout will be provided that explains the field assignment (how to collect water samples) and the laboratory exercise (how to analyze water samples for fecal coliform bacteria by membrane filtration).  

### Class Eight – November 3, 2003

**Ecological Sanitation**  

**Christine L. Moe**


### Class Nine – November 10, 2003

**Schistosomiasis**  

**Evan Secor, CDC**

Class Ten – November 17, 2003

Models for predicting disease emergence

Readings: TBD

Leslie Real, Emory

Class Eleven – November 24, 2003

Malaria and climate change

Readings:
- Reiter, P. From Shakespeare to Defoe: Malaria in England in the Little Ice age. Emerging Infectious Diseases, 2000;6:1-11
  http://www.cdc.gov/ncidod/eid/vol6no1/reiter.htm
- Epstein, P.R. Is Global Warming Harmful to Health? Scientific American, 2000; Aug:50-57

John MacArthur, CDC

Classes Twelve, Thirteen and Final exam – December 1 & 8, 2003

Student Presentations

Final exams are due December 15, 2003 by 5 p.m. You must provide a hard copy of your exam to Hannah Cluck (#766, 7th floor of the Grace Crum Rollins building) before the deadline. Email submissions will not be accepted because of possible server failure.

Contact Information for Guest Lecturers:

Ellen Dotson, Ph.D.
Vector Genetics Section
Entomology Branch
Division of Parasitic Diseases
Centers for Disease Control and Prevention
4770 Buford Hwy, Mail Stop F-22
Chamblee, GA 30341-3724
Tel: (770) 488-4837
Fax: (770) 488-4258
E-mail: ebd6@cdc.gov

Atlanta, GA 30329
Tel: 404-498-1364
Fax: 404-498-1355
Email: zdf8@cdc.gov

Debbie Moll, Ph.D.
Environmental Health Scientist
Health Studies Branch
National Center for Environmental Health
Centers for Disease Control and Prevention
Mailing Address:
1600 Clifton Rd., NE
M.S. E-23
Atlanta, GA 30333

Tel: 770-488-4115
Fax: 770-488-4108
E-mail: was4@cdc.gov

John R. MacArthur, MD, MPH
Malaria Epidemiology Branch
Division of Parasitic Diseases
Centers for Disease Control and Prevention
4770 Buford Highway, MS F-22
Atlanta, GA 30341
Tel: 770-488-7780
Fax: 770-488-7761
Email: jmacarthur@cdc.gov

W. Evan Secor, PhD
Immunology Branch
Division of Parasitic Diseases
Centers for Disease Control and Prevention
4770 Buford Highway, MS F-13
Atlanta, GA 30341
Tel: 770-488-4115
Fax: 770-488-4108
E-mail: was4@cdc.gov