

Health and Medical Geography
GEOG 4852/5852
Spring 2011
Tues/Thurs 2-3:45pm
Ramaley Biology Room N1B23

Office Hours

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Office Hours: Tuesday/Thursday 9-10am

Course Description and Objectives

This course surveys medical geography, a subdiscipline which encompasses a broad range of geographical work on health and health care. Medical geography deals with human-environment interactions and the influence these interactions have on public health. What distinguishes medical geography from the discipline of geography as a whole is simply its thematic focus, not its methods or theoretical grounding. Throughout the semester we will use the concepts and techniques of the discipline of geography to investigate a variety of health-related topics. The focus of this course will be on geographical patterns of health and disease from the viewpoint of populations rather than individuals. The focus of medicine is on the treatment of individuals; our focus, like that of public health, will be on understanding health and disease from the perspective of populations.

This course covers three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial statistics to identify patterns of single and associated variables. Students are encouraged to view these three approaches as complimentary. Much research in medical geography incorporates ecological, social and spatial theories and methodologies. Medical geography is an integrative and multidisciplinary, incorporating contributions from a wide range of specialties. Specific course objectives include:

1. Facilitate a critical understanding of health, disease, illness, and society;
2. Introduce some of the major contemporary issues in global health;
3. Promote an understanding of how geography as a discipline contributes to understanding health and health care;
4. Understand the impact of ecological and population change on health;

5. Explain how social and economic context impact health;
6. Utilize maps to examine the spatial patterns of disease and risk factors that may contribute to disease; and
7. Within the context of the course content, improve writing, communications, critical thinking, and analytical skills.

Class policies (e.g., What is expected of you...)

- **Attendance is required**. If you cannot attend a class, please let me know beforehand. You will have two "excused" absences throughout the semester for which you will not need to provide a legitimate excuse for missing class. If you miss more than two classes, you will not receive points for the day and this will negatively impact your individual participation and group grades. If you have a valid reason for missing a class (medical, family issue, conference, etc) you will be given the opportunity to make up any for-credit activities you missed.
- **Do all the readings prior to class, and be prepared to demonstrate your mastery of the material** via the day's Individual Readiness Assessment Test (IRAT), and by contributing to your team's answers to the Group Readiness Assessment Test (GRAT).
- **Contribute actively and substantively to team tasks and class discussions**. Be prepared to discuss how the concepts covered in the readings apply to the day's case studies and team tasks. As you do a day's assignment, jot down a few "margin notes" so you'll be ready to add your ideas to the class discussion or to respond if called upon.
- All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Plagiarism, falsification of data, cheating, and other types of academic misconduct will be handled according to university guidelines. To review CU's policy see the following site:<http://www.colorado.edu/academics/honorcode/>.
- Please be respectful of your class colleagues and instructor. Class disruptions and side conversations should be kept to a minimum. This includes turning off your cell phone ringer when you enter the class.
- Students with special needs should bring these to my attention during the first two weeks of class. Appropriate accommodations will be made.

Required text and readings

****Clickers are required for this course****

- Meade, M.S. and Emch, M.E. 2010. Medical Geography, 3rd ed. New York: The Guilford Press.

In order to get adequate breadth in the course I have selected a variety of additional required readings, most from major peer-reviewed journals such as *Social Science and Medicine*, *International Journal of Epidemiology* or *The Professional Geographer*. Please bring copies of these readings, or at least your notes on them, to class on the days that these

readings are assigned as we may discuss them in class. These readings will be available on the course CULearn website.

Grading

The points available for the course are divided among a large number of activities to ensure that no one is excessively penalized for falling down on one particular activity. All assignments are due on time, and will be penalized 5% of your grade for each day late. There will be no make-ups for the midterm or final unless you have a legitimate excuse.

Individual Participation (Individual Readiness Assessment Test)	20% (25% for grad students)
Team Participation (Group Readiness Assessment Test)	15%
Case Study Write-up #1 (Due Mar 29th)	15%
Case Study Write-up #2 (Due Apr 28th)	15%
Midterm (Feb 24th)	15%
Final (April 30th)	20% (15% for grad students)

The Individual Readiness Assessment Test (IRAT) is a method for assessing how well you, as an individual, have prepared for the day's class. The IRAT will include a series of 5-10 questions based on the day's readings. You will be given one point for each question answered correctly.

The Group Readiness Assessment Test (GRAT) allows you to revise your answers to the IRAT after discussing the questions with your team. Teams will be given one point for each question answered correctly.

****I will drop the lowest IRAT and GRAT scores when I compute your final grade. Therefore, if you miss an IRAT/GRAT due to an absence/illness/etc. it will simply be dropped from your grade. Please do not ask if you can make it up, unless you have a legitimate documented reason for an absence.****

Throughout the course you will also work through a series of case studies in your groups. Each individual will be responsible for writing up two of these case studies (you will be allowed to choose which two) so it will be important to take notes during class. Write-ups will consist of a 3-4 page paper explaining the problem posed in the case study, your group's conclusion/resolution of the problem and individual thoughts about the case study (e.g., were there any parts of the group's assessment you disagreed with, did you come to a different conclusion, how did your team work on this problem, how well did you work as part of your team?).

We will also have a midterm and final.

Graduate students: We will meet outside of class on several occasions to discuss additional readings which will figure into your individual participation grade. I will contact you to set this up.

University Policies

Disabilities: If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services within the first two weeks of the semester. Disability Services determines accommodations based on documented disabilities.

Contact: <http://www.colorado.edu/disabilityservices>.

Class Behavior: Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Further information is available at: <http://www.colorado.edu/policies/classbehavior.html>.

Discriminatory and Sexual Harassment: The University of Colorado at Boulder policy on Discrimination and Harassment, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships apply to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH, the above referenced policies and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>.

Academic Integrity: All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. See the following site: <http://www.colorado.edu/academics/honorcode/>. "Our university community aspires to the highest standards of integrity and does not accept dishonesty or respect. We are committed to the fundamentalist values of honesty trust fairness, respect, and responsibility. These values enable us to promote teaching and learning, academic excellence, the pursuit of truth, free and open inquiry and discourse, responsible citizenship, and compassion. Each person at the University of Colorado at Boulder is responsible for upholding the honor code and helping to create an environment in which the integrity of the campus community is defined by mutual respect, self respect, and shared responsibility."

Religious Observances/Absences: Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please come to me in advance if this is an issue, so we can work out alternative arrangements. See full details at: http://www.colorado.edu/policies/fac_relig.html.

COURSE OUTLINE, READINGS AND ASSIGNMENTS

**** (I reserve the right to make some changes to the course content over the semester) ****

INTRODUCTION/EPIDEMIOLOGY CONCEPTS

Week 1 - Introduction to Medical and Health Geography, Concepts of Health and Disease, Epidemiological Terminology

- What is medical geography?
- What is health geography?
- How do we define health?
- Some epidemiological terminology that will help you throughout the semester

Readings: Meade & Emch, "Chapter 1: Questions of Medical Geography"
Gatrell, "Chapter 1: Describing and Explaining Health in Geographical Settings"

Suggested Reading: CDC's Glossary of Epidemiology Terms:

<http://www.cdc.gov/reproductivehealth/epiglossary/glossary.htm>

ECOLOGICAL APPROACHES

Week 2 - Disease Ecology

- What is disease ecology?
- How do we use this theoretical framework to understand the spatial distribution of disease?
- Why/how are specific diseases affected by population, habitat and behavior to greater or lesser extents?
- What is a natural nidus and how does it relate to landscape epidemiology?
- Case studies: HIV, Lyme Disease, Malaria

Readings: Meade & Emch, "Chapter 2: The Human Ecology of Disease" (pages 26-55 only)
and "Chapter 4: Landscape Epidemiology"

IRAT & GRAT

Week 3 - Emerging and Reemerging Diseases: Ecological Change, Evolution of Pathogens & People

- What are emerging and reemerging diseases?
- What are the drivers that cause diseases to re(merge)?
- How have environmental changes impacted disease distributions?
- How has evolution led to the emergence/reemergence of diseases?
- Case studies: Schistosomiasis, Influenza

Readings: Emch, M.E. and Root, E.D. 2010. Emerging and Reemerging Infectious Diseases. *Companion to Health and Medical Geography*.
Mayer, J. 2000. Geography, ecology, and emerging infectious diseases. *Social Science and Medicine* 50: 937-952.
Bell, D., S. Roberton, P.R. Hunter. 2004. Animal origins of SARS coronavirus: possible links with international trade in small carnivores. *Phil Trans R Soc Lond B* 359: 1107-1114.

Team Task: Ecology/Evolution Case Study

Week 4 - Demographic and Epidemiological Transitions, Migration, Mobility and Globalization

- How have mortality and fertility levels changed over time? Have these trends differed in different areas of the world?
- How have the major causes of death changed over time? Why have these changes occurred?
- What's the difference between mobility, migration and circulation?
- How does mobility contribute to disease transmission?
- How has mobility changed over time?
- Case Studies: Cardiovascular Disease, Dengue Fever

Readings: Meade & Emch, "Chapter 5: Transitions and Development" and "Chapter 10: Disease Diffusion in Space"

Stevens, G., R.H. Dias, K.A.J. Thomas, et al. 2008. Characterizing the Epidemiological Transition in Mexico: National and Subnational Burden of Diseases, Injuries and Risk Factors. *PLOS Medicine* 5(6): e125.

Suggested Reading: Reddy, K.S. and S. Yusef. 1998. Emerging Epidemic of Cardiovascular Disease in Developing Countries. *Circulation* 97: 596-601.

IRAT & GRAT

Week 5 - Food and Nutrition

- How has agricultural production changed over time?
- How have changes to agriculture impacted human nutrition and, ultimately, human health?
- What is the nutritional transition? How is related to changes in agriculture? How has influences the emergence of chronic disease?
- Case studies: Japanese encephalitis, obesity

Readings: Review Meade & Emch, "Chapter 5: Transitions and Development" section on "Nutrition in Transition"

Doak, C., L. Adair, M. Bentley, C. Monteiro, and B. Popkin. 2005. The dual burden household and the nutrition transition paradox. *Intl Journal of Obesity* 29: 129–36.

Popkin, B., and P. Gordon-Larsen. 2004. The nutrition transition: Worldwide obesity dynamics and their determinants. *Intl Journal of Obesity* 28: 52–59.

Suggested Reading: Prentice, A.M. 2006. The emerging epidemic of obesity in developing countries. *Intl Journal of Epidemiology* 35: 93-99.

Suggested Reading: Zhai, F., D. Fu, S. Du, K. Ge, C. Chen, and B. Popkin. 2002. What is China doing in policymaking to push back the negative aspects of the nutrition transition? *Public Health Nutrition* 5: 269-73

Team Task: Food/Nutrition Case Study

Week 6 - Environmental Exposure

- What do we mean by environmental exposure?
- What are the different types of environmental exposures? How are they connected?
- What is an "exposure pathway"?
- How might climate change affect the distribution of disease?
- Case studies: Minimata disease, extreme weather events

Readings: Meade & Emch, "Chapter 7: The Pollution Syndrome"

NJDHHS & ATSDR. 1997. *A review and Analysis of Cancer Registry Data, 1979-1995 for Dover Township, New Jersey.*

NJDHHS & ATSDR. 2001. *Citizens' Guide to the Drinking Water Quality Analysis March 1996 - June 1999.*

NJDHHS & ATSDR. 2001. *Citizens' Guide to the Ciba-Geigy Public Health Assessment.*

NJDHHS & ATSDR. 2001. *Citizens' Guide tot he Reich Farm Public Health Assessment.*

Suggested Reading: Gatrell, Chapter 8.

Team Task: Environmenal Exposure Case Study

Week 7 - Catch-up and Review

Midterm Exam Feb 24th

SPATIAL APPROACHES

Week 8 - Health Data

- What type of data is needed to study disease spatially?
- Where and how can I collect these data?

Readings: Cromley & McLafferty, "Chapter 2: Spatial Data"

IRAT & GRAT

Week 9 - GIS and Public Health

- What goes into the mapping and visualization of health information?
- How can I tell a good map from a bad map?
- What can I learn from maps?

Readings: Meade & Emch, "Chapter 3: Maps and Geographic Information Systems in Medical Geography"

Additional readings TBA

Team Task: Measuring Health and Well-being in a GIS

Week 10 - Spatial Analysis and Health

- What spatial techniques, in addition to mapping, are useful for studying health?

Readings: Meade & Emch, "Chapter 12: Scale, Spatial Analysis and Geographic Visualization".

Additional readings TBA

IRAT & GRAT

Team Task: Mapping Disease Clusters

Week 11 - NO CLASS SPRING BREAK

SOCIAL APPROACHES

Week 12 - The Social Context of Disease

- What health inequalities exist today? How does health vary around the world?
- What are the origins of these inequalities?
- How is socioeconomic status related to health outcomes?
- What can be done to alleviate these inequalities?

Readings: Gatrell, "Chapter 4: Inequalities in Health Outcomes".

Adler, N., T. Boyce, M. Chesney, et al. 1994. Socioeconomic Status and Health. *American Psychologist* 49(1): 15-24.

Movie: *In Sickness and In Wealth*

IRAT & GRAT

First case study write-up due on Tuesday of this week in class (March 29th)!

Week 13 - The Political Ecology of Health & Healthcare

- What is political ecology? How is it related to political economy?
- How do political interests lead to ecological change?
- How do politics influence the spatial distribution of both communicable and noncommunicable diseases?
- Case studies: Schistosomiasis, Cancer

Readings: Meade & Emch, "Chapter 8: Political Ecology on Noncommunicable Diseases"

Mayer, J. D. 1996. The Political Ecology of Disease as a New Focus for Medical Geography. *Prog. in Human Geography* 20:441-456.

Walton, S. 1981. Egypt After the Aswan Dam. *Environment* 23(4): 31-36.

Wikipedia page: "Aswan Dam": http://en.wikipedia.org/wiki/Aswan_Dam

Biswas, A.K. 2002. The Aswan Dam Revisited. *Development and Cooperation* 6: 25-27.

Team Task: Political Ecology Case Study

Week 14 - Poverty, Neighborhoods & Health

- How do we define poverty?
- How does poverty influence health and/or lead to health disparities?
- How do we define "neighborhood"?
- How do neighborhood environments act to influence health behaviors and outcomes?

Readings: Meade & Emch, "Chapter 9: Neighborhoods and Health"

IRAT & GRAT

Week 15 - Health Services Planning

- How are health resources distributed? What inequalities exist?
- What does "access" mean?
- What can be done to promote equitable access to health care?
- Why are hospitals located where they are?

Readings: Meade & Emch, "Chapter 11: Health Care and Promotion"

Team Task: Hospital Location Analysis

Week 16 - Therapeutic Landscapes

- What in the world is a therapeutic landscape? How has this concept changed over time?
- How does this concept related to the provision of health care in the U.S.?

Readings: Frumkin, W. 2003. Healthy Places: Exploring the Evidence. *American Journal of Public Health* 93(9): 1451-1456.

Gesler, W.M. 1993. Therapeutic landscapes: theory and a case study of Epidaurous, Greece. *Environment and Planning D* 11: 171-189.

IRAT & GRAT

Second case study write-up due Thursday of this week in class (April 28th)!