University of Massachusetts at Boston
McCormack School of Policy Studies

Epidemiological Thinking and Population Health

PPol G 753, crosslisted as Nursng 753 & CrCrTh 653
Syllabus
Spring 2015

I. Quick access to key information and links to bookmark on your browser

followed by
II. Information to get started, orient yourself at the start of the course, and refer back to from time to time
III. Contract: Course requirements and assessment
IV. Schedule of classes: What is expected each session and why -- how each session contributes to the unfolding of the course. (This section starts with links to specific sessions)
V. Bibliography (repeated, with links to pdfs, on the wiki)

POST-IT *the start of each component in your printed version of this syllabus*

Instructor	Peter Taylor, Science in a Changing World graduate track
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Class meetings	Tues 4-6.45pm. W-2-157 or from a distance by google hangout, http://bit.ly/753hangout
Contact hours	By signup at ptaylor.wikispaces.umb.edu/PTOfficeHours, or by arrangement
Syllabus	www.faculty.umb.edu/pjt/753-15.html **BOOKMARK THIS!**
Wiki	ppol753.wikispaces.umb.edu **BOOKMARK THIS!** with links to Notes elaborating on requirements, password-protected readings and, for each session, to notes about preparing, annotations of readings from previous years, and visual aids and audio recording of lectures
Blog	blogs.umb.edu/ppol753-s15/ **BOOKMARK THIS!** viewable only by students and instructor-for posting of sketches (aka installments in the project), annotations of readings, glossary entries, and other reflections
Glitches	use bit.ly/692glitches to report glitches in online materials

II. Information to get started, orient yourself at the start of the course, and refer back to from time to time

Catalog description: Introduction to the concepts, methods, and problems involved in analyzing the biological and social influences on behaviors and diseases and in translating such analyses into population health policy and practice. Special attention given to social inequalities, changes over the life course, and heterogeneous pathways. Case studies and course projects are shaped to accommodate students with interests in diverse fields related to health and public policy. Students are assumed to have a statistical background, but the course emphasizes epidemiological literacy with a view to collaborating thoughtfully with specialists, not technical expertise.

Texts and Materials:
Gordis, L. Epidemiology. Philadelphia, Saunders/ Elsevier. (=primer for the course. Old editions are OK.)
Readings on a password-protected site (i.e., not on Healey e-reserves).
Useful texts, but not required:
Kirkwood, B. R. and J. A. C. Sterne (2003). Essential Medical Statistics. Malden, Blackwell (something to borrow, not buy)
A guide on technical matters of writing scholarly papers, such as, Turabian, K. L. (1996). A Manual For Writers of Term papers, Theses, and Disertations. Chicago: University of Chicago Press.
A reference on tools and processes for inquiry, writing and collaboration: Taylor, P., J. Szteiter (2012)

Taking Yourself Seriously: Processes of Research and Engagement. Arlington: The Pumping Station (online as paperback or pdf from http://thepumpingstation.org/books or as paperback from other online booksellers)

Overview and Mechanics of Course:
The syllabus is organized around a sequence of basic ideas in thinking like epidemiologists, especially epidemiologists who pay attention to possible social influences on the development and unequal distribution of diseases (aka health disparities) and behaviors in populations. Each session has 4 parts:

a) mini-lecture (with visual aids) *during the last part of the previous meeting* (recording then posted on the wiki);
b) hour-long discussion on the topic, ideas, and readings for the session (using a five-phase format);
c) check-in about how you are applying the themes of the *previous* session into your project; and
d) workshop or discussion on applying the themes of the *current* session into your project (including questions raised but not resolved during the structured hour-long discussion).

(Online students join the class sessions using googlehangout. With special permission, online students can take the whole course *asynchronously*, or any student can make up for a missed session, in which case you listen to the recordings of the mini-lecture and class meeting, then post to the course blog your contributions re: b-d.)

To prepare for each week's **discussion**, students read the common readings and at least one of the supplementary readings (or an alternative drawn from the student's own area of focus) (for doctoral students, at least two), post annotations of those readings to the blog by the night before class, and review the postings of other students before class. For the **project**, each student identifies a research or policy issue for the semester and each week prepares a sketch of ways that the concepts, methods, and problems of that week might be applied that issue. The provisional project is that all students address the question of the health consequences of high-fructose corn syrup in the US diet, taking off from the youtube by pediatric endocrinologist, Robert Lustig. (In session 2 we will decide whether some or all students define a different issue of their own interest.) Students also post regular additions to a **glossary** of terms from chapters of the Gordis text illustrated by examples from the project or the student's field. Blog posts on reflections on the learning process or epidemiological thinking (or lack thereof) in the news are welcome at any time. In an end-of-course **portfolio**, students select highlights from their sketches, annotations, and glossary entries, then introduce them with an essay that explains to an outside reader the development of their thinking during the course and plans for further development.

The conventional notion of teaching as transmission of knowledge from instructor to students has some place in this course. The instructor provides (through the mini-lectures and course wikipages) an introduction to and motivation of each session's readings and cases. The instructor will also provide assistance with technical questions of concern either to the whole class or to individual students, refer to relevant sections of Gordis and Kirkwood, and/or help students create a network of specialists they can consult with during and the semester and after the course is over. At the same time, it is expected that students (and the instructor) will have to employ strategies of reading that allow us to extract take-home lessons from readings even as we skip sections that become too technical for us. The course as a whole aims to cultivate skills and dispositions of critical thinking and of life-long, cooperative learning facilitated by the resources of the internet. The use of controversies follows an idea central to critical thinking, namely, that we understand ideas better by holding them in tension with alternatives.

Technical:

- Make bookmarks on your browser to quick access links (see sect. I of syllabus); Set up access to online bibliographic databases via the library; Arrange bibliographic software for references; Know your official @umb.edu student email address and password; Accept the invite (to your UMB email) to join the wiki; Organize your computer (e.g., separate folders/directories for course work, downloaded readings, etc., replicate this file organization on a flash drive or other backup medium, and have a system for synchronizing and backing up files--see research competencies for more detail and other suggestions.) Face2face students: Bring laptop if you have one, registered for UMB wifi.
- For students from a distance: Sign up for google+ and install plugins for hangouts; Establish high bandwidth internet access (e.g., ethernet cable into modem); Procure and use reliable headset; Practice on a hangout muting when not speaking and screensharing of document (see tips); Refer to wiki readings page for access to mini-lecture hangout URLs.

Writing Support beyond the course: For graduate students, see

http://cct.wikispaces.umb.edu/writingsupport.

Accommodations: Sections 504 and the Americans with Disabilities Act of 1990 offer guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center (287-7430). The student must present these recommendations to each professor within a reasonable period, preferably by the end of the Drop/Add period.

Students are advised to retain a copy of this syllabus in their personal files.

This syllabus is subject to change, but workload expectations will not be increased after the semester starts.

Version 27 January '15

Acknowledgements: The assistance of Jan Coe and Louisa Holmes, the advice of Yoav Ben-Shlomo and Barbara Goldoftas, the hospitality of the Department of Social Medicine, University of Bristol. and suggestions made by various members of the Spirit of 1848 listserv have been helpful in the development of the syllabus for this course since its inception in 2007.

III. Contract: Course requirements and assessment

- The course revolves around weekly written assignments as well as participation items (which include active participation during class based on preparation between classes), as summarized below. Guidance on how to think about the specific assignments can be drawn from the material in the Notes on Teaching/Learning Interactions.
- It is expected that you will spend at least 7 hours per session outside class time reading, researching, and writing. The course works by building from topic to the next so not being prepared or late submissions detract significantly from the learning possible in class sessions.
- Use your personal assignment checklist (on the blog) to keep track of due dates and throughout the semester record assignments and participation items submitted/fulfilled. Do not expect emails, class-time or meetings with the instructor to be taken up reminding you.
- You can ask for extensions on two assignments or participation items, moving the due date as far back as the last session. Also, to accommodate the contingencies of your lives, 20% of the assignments and participation items can be skipped altogether without penalty. (No explanation is needed for extensions or skipped work. Simply record these on your assignment checklist and keep up with other assignments and participation items.) (See policy for requesting an Incomplete.)
- The written assignments are commented on, but not graded. Not grading keeps the focus on Dialogue around written work, which provides guidance on Revision and Resubmission tailored to each student's specific interests and needs. You are expected to read comments carefully, consult with the peer commenter or instructor if you don't understand a comment they made, revise thoughtfully (i.e., do more than touch up) in response to the comments, and resubmit within a week. (Sometimes you might be asked to revise again; sometimes you will get OK/RNR = revision not requested.) (See Rationale for the Assessment system.)
- *For CCT graduate students only*: The essay accompanying your Portfolio should be suitable for inclusion in the required Reflective Practitioner's Portfolio.

Written assignments, 3/4 of course grade
a. Regular additions to glossary of terms from the Gordis text, illustrated by examples from the student's field (5-10 lines each; averaging one term [or set(s) of related terms] per week, weeks 2-14).
b. Weekly sketches of ways that the concepts, methods, and problems of that week might be applied to the research/policy question (250 words; posted during the week after the class for sessions 2-13).
c. Weekly annotations of one of the common readings and one supplementary reference (or additional reference drawn from student's area of interest) (1 paragraph for each; posted at least 1 day before class; weeks 2-14).
d. Portfolio, including selection (from a-c) and essay (1000-1500 words) on development of student's thinking during the course and plans for further development (2 assignments = Complete Draft week 13 and Final version revised in response to comments one week afetr week 14).

Participation and contribution to the class process, 1/4 of course grade
e. Punctual attendance in class meetings (14 items)*
f. Prepared participation in class discussions and workshop period (for weeks 2-14; 13 items)**
g. Syllabus "quiz" (submitted as comments on the designated blog post)
h. Minimum of two in-office or phone conferences on your projects and other questions (one by week 5,

the other by week 10; 2 items)
i. Assignment check-list maintained by the student throughout the semester (reviewed mid-semester and at end with self-assessment completed)
j. Comment on another student's draft portfolio selection and essay

> [* Asynchronous online students replace e. with a blog post check-in by the time of class and another post by the weekend consisting of reflections from 4 points spread across the hour-long discussion and initial thoughts about applying the themes of the current session. Ditto for make-up. ** Replacing f. for these students, and as an optional for extra points for other students, post comments on the blog on another student's sketch.]

Overall course grade. If you complete at least 32 of the written assignments and at least 25 participation items you get 80 points. (If you do fewer of either, you get 2 points for each written assignment submitted on time & revised (unless you get OK/RNR) [1 point for late submissions/revisions] and 1 for each participation item up to a maximum of 80.) This rubric is used at the end of the course to add further points:
For each quality "fulfilled very well" you get 2 additional points. If you "did an OK job, but there was room for more development/attention," you get 1 point. If it was not much evident; you get 0 points.
1. Sketches for project submitted weekly with timely revisions when requested,
2. revised thoroughly and with new thinking in response to comments,
3. showing progressive growth in ability to translate epidemiological thinking into a specific area, and resulting in
4. final portfolio with well-selected examples and a well-structured essay that explains your development during the semester and future plans.
5. Contributions to the hour-long discussions in which you bring in focused questions or insights from the common and supplementary readings.
6. Prepared check-ins and participation in workshop/discussion periods about applying the themes of the sessions into your project.
7. Preparation and on-time posting of annotated references.
8. Preparation and on-time posting of glossary entries.
9. Collaboration with others (of differing skills and interests) and reflection on personal and professional development.
10. Established practices of learning from material one does not fully grasp at first reading/hearing.

Minimum points for letter grades: A >= 95 points, A- 87.5, B+ 80, B 72.5, B- 65, C+ 57.5, and C 50.

IV. Schedule of classes: What is expected each session and why -- how each session contributes to the unfolding of the course

Quick links to sessions (1: 1/27, 2: 2/3, 3: 2/10, 4: 2/17, 5: 2/24, 6: 3/3, 7: 3/10, 8: 3/24, 9: 3/31, 10: 4/7, 11: 4/14, 12: 4/21, 13: 4/28, 14: 5/5)

Recommended reading in advance of the course: Rabin (2009) for Class 1

(1/27) 1a. The course as a learning community
Idea: Developing epidemiological literacy requires collaboration with others (of differing skills and interests) and reflection on personal and professional development.
Students identify personal, intellectual, professional interests in relation to central themes about inequality, pathways of development, social determinants of health, and policy (worksheet, followed by spoken introductions).
1b. Reading and learning strategies
Idea: Developing epidemiological literacy requires establish our own practices of learning from material we don't fully grasp at first reading/hearing, practices shaped to complement our own specific interests and work.
(instructions)
Case 1: Risks in risk reduction (Rabin 2009)
Case 2: On health consequences of high-fructose corn syrup in the US diet, youtube by pediatric endocrinologist, Robert Lustig Note: Continuing discussion of reading and learning strategies might take place throughout the semester via reflections posted to the blog.
Supplementary Reading: Ness 2012

Mini-lecture to set the scene for the topic of the next week. (*ditto for subsequent weeks, even though not listed explicitly from week 2 on.*)
"Of Rice and Men"

(The case of Christiaan Eijkman and his search for the cause of beriberi in the Dutch East Indies in 1890s, D. Allchin) (introduction; link to full case to be added after the class)

Homework: 1. Complete the "syllabus quiz" to review this syllabus, the wiki and links in the navigation bar, Notes on teaching/learning interactions and linked guidelines on the wiki site, assessment system, access to readings, and the blog.
2. Watch till the end of the Lustig video with a view to the research or policy issue for the semester-long project being the health consequences of high-fructose corn syrup in the US diet or something different. We'll workshop on defining your angle on this project or define different project areas in session 2.
3. Prepare for session 2, including submit first glossary entry and first annotations of readings.

(2/3) 2. Phenomena: Exploring the "natural history" of disease
Idea: Detailed observation (like a naturalist) or detective work--albeit informed by theoretical ideas--may be needed before we can characterize what the phenomenon is we are studying, what questions we need to ask, and what categories we need for subsequent data collection and analysis.
Common reading and cases: Oxford 2005 (1918 flu pandemic), Barker 1971 (buruli disease)
Supplementary Readings: Barker 1998,pp.1-12, 167-172, Barker 1999, Brody 2000, Cohen 2014, Friedman 2013, PBS "Killer flu" Video
Idea (behind glossary): Non-specialists need to become comfortable with the fundamental ideas and basic vocabulary of epidemiology in order to converse intelligently with specialists in epidemiology and biostatistics. (One way to move in that direction is to practice making the ideas accessible to the layperson. Another way is to apply the ideas to a specific area of health research and policy and to address any controversies among the ideas.)
Check-in replaced this session by Workshop, which will cover glossary entries (instructions), definition of a research and policy issue for the semester-long project, and translation of this week's concepts, methods, and problems into that project area.
Also: Questions on syllabus and course mechanics, including coaching each other on use of wordpress blog and wiki.
(*Workshop sessions will be held in future weeks even though not listed explicitly from this point on.*)

(2/10) 3. The scope and challenges of epidemiology
Idea: The uses of epidemiology are many, but shift over time, and are subject to recurrent challenges from inside and outside the field.
Idea: In advising on the most effective measures to be taken to improve the health of a population, epidemiologists may focus on different determinants of the disease than a doctor would when faced with sick or high-risk individuals.
Idea: Epidemics affect population health, but are not the primary focus of social epdemiology.
Common readings: Davey-Smith 2001 (uses of epidemiology), Rose 1985 (population health)
Supplementary Readings: Brandt 2000, Caldwell 2001, Davison 1991, Hoffman 2014, Krieger 2010a, McMichael 2011, Nandi 2014, Pearce 1996, Putnam 2008, Schwartz 1999

(2/17) 4. Categories
Idea: Collecting and analyzing data requires categories: Have we omitted relevant categories or mixed different phenomena under one label? What basis do we have for subdividing a continuum into categories? How do we ensure correct diagnosis and assignment to categories? What meaning do we intend to give to data collected in our categories?
Common readings and cases: Davey-Smith et al. 2000 (Comparative methods for studying socioeconomic position and health in different ethnic communities), Poland 2004 ("schizophrenia")
Supplementary Readings: Birley 2000, Dohrenwend 1993, Hacking 2013, Hymowitz 2007, Marks 2003, Pickles 2003

(2/24) 5. Associations, Predictions, Causes, and Interventions
Idea: Relationships among associations, predictions, causes, and interventions run through all the cases and controversies in this course. The idea introduced in this session is that epidemiology has two faces: One from which the thinking about associations, predictions, causes, and interventions are allowed to cross-fertilize, and the other from which the distinctions among them are vigorously maintained, as in "Correlation is not causation!" The second face views Randomized Control Trial (RCTs) as the "gold-standard" for testing treatments in medicine. The first face recognizes that many hypotheses about treatment and other interventions emerge from observational studies and often such studies provide the only data we have to work with. What are the shortcomings of observational studies we need to pay attention to (e.g., systematic sampling errors leading to unmeasured confounders-see next class)?
Common readings and cases: Ridker 2007 (Cardiac risk factors), Stampfer 1991, 2004 (Hormone replacement therapy)
Supplementary Readings: Alzheimer Research Forum 2004, Antithrombotic 2009, Blakey 2014, Davey-Smith & Ebrahim 2007,pp2-8, Jick 2000, Petitti 2004, Seshasai 2012, Shunkert 2008, Sihvonen 2013,

Smith 2003

(3/3) 6. Confounders & conditioning of analyses
Idea: Statistical associations between any two variables generally vary depending on the values taken by other "confounding" variables. We need to take this dependency (or conditionality) into account when using our analyses to make predictions or hypothesize about causes, but how do we decide which variables are relevant and real confounders?
Common readings and cases: Davey-Smith 1997 (Control at work and mortality), Davey-Smith & Ebrahim 2007 (Mendelian randomization to analyze environmental exposures), Hernan (2000), Lynch 2007 (video)
Supplementary Readings: Davies 2006, Egede 2003, Franks 2011, Huxley 2002, Lawlor 2004, Marmot 2001, Petitti 2005, Prentice 2005

(3/10) 7. Variations in health care (by place, race, class, gender)
Idea: Inequalities in people's health and how they are treated are associated with place, race, class, gender, even after conditioning on other relevant variables.
Common readings and cases: Alter 1999 (Access to cardiac procedures), Lynch 2007 (video)
Supplementary Readings: Bassuk 2002, Davey-Smith 2000, Dunn 2007, Egede 2003, Gawande 2009, Krieger (2005, 2010, 2010a, 2014, 2014a), Marmot 2001, Roger 2000, Wright 2004

Mid-semester self-assessment

No class 3/17 - chance to catch up with glossary and sketches and revisions

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(3/24) 8. Heterogeneity within populations and subgroups
Idea: How people respond to treatment may vary from one subgroup to another--When is this a matter of chance or of undetected additional variables? How do we delineate the boundaries between subgroups?
Common readings and cases: Regan 2005 (Forms of breast cancer), Lagakos 2006 (Statistical concerns)
Supplementary Readings: Davey-Smith 2011, Eikelboom 2003, Fazel 2013, Gum 2003, Kahn 2007, Nelson 2005, Steinbach 2014

(3/31) 9. Placing individuals in a multileveled context
Idea: Different or even contradictory associations can be detected at different levels of aggregation (e.g., individual, region, nation), but not all influences can be assigned to properties of the individual—Membership in a larger aggregation can influence outcomes even after conditioning on the attributes of the individuals.
Common readings and cases: Freedman 2001 (Ecological and atomistic fallacies), Diez-Roux 2002a, b (Neighborhood effects), Marcelli 2006 (Obesity)
Supplementary Readings: Balfour 2002, Coulton 1999, Dunn 2007, Friedman 2014, Friedman 2015, Holmes (2012), Korbin 2000, Lawlor 2005, Marcelli 2005, Oakes 2004, Schootman 2007

(4/7) 10. Life course epidemiology
Idea: How do we identify and disentangle the biological and social factors that build on each other over the life course from gestation through to old age?
Common readings and cases: Ben-Shlomo 2002 (Life course development of disease), Brown 1978 (Life Events and Difficulties)
Supplementary Readings: Barker 1998,pp43-80, Berney 2000, Davey-Smith 2007, Krieger 2005b, Kuh 2003, Lynch 2005.

(4/14) 11. Multivariable "structural" models of development
Idea: Just as standard regression models allow prediction of a dependent variable on the basis of independent variables, structural models can allow a sequence of predictive steps from root ("exogeneous") through to highest-level variables. Although this kind of model seems to illuminate issues about factors that build up over the life course, there are strong criticisms of using such models to make claims about causes.
Common readings and cases: Kendler 2002 (pathways to depression in women), Freedman 2005 (Structural models as causal models?)
Supplementary Readings: Chandola 2006, Ou 2005, Rini 1999

(4/21) 12. Heritability, heterogeneity, and group differences
Idea: As conventionally interpreted, heritability indicates the fraction of variation in a trait associated with "genetic differences." A high value indicates a strong genetic contribution to the trait and "makes the trait a potentially worthwhile candidate for molecular research" that might identify the specific genetic factors involved. I contest the conventional interpretation and contend that there is nothing

reliable that anyone can do on the basis of estimates of heritability for human traits. While some have moved their focus to cases in which measurable genetic and environmental factors are involved, others see the need to bring genetics into the explanation of differences among the averages for groups, especially racial groups.
Common readings and cases: Moffitt 2005 (Interaction of measured genes and measured environments), Taylor 2013a (skepticism about the estimation and interpretation of heritability)
Supplementary Readings: Caspi 2002, Davey-Smith 2009, Davies 2011, Dickens 2001, Plomin 2006, Rosenquist 2014, Rushton 2005, Rutter 2002, Taylor 2010, 2013, Turkheimer 2000, Young 2006

(4/28) 13. Genetic diagnosis, treatment, monitoring, and surveillance
Idea: Genetic analysis has begun to identify genetic risk factors. We need to consider the social infrastructure needed to keep track of the genetic and environmental exposures with a view to useful epidemiological analysis and subsequent healthcare measures. Even in cases where the condition has a clear-cut link to a single changed gene and treatment is possible, there is complexity in sustaining that treatment.
Common readings and cases: Khoury 2007 (Many genes as small risk factors), Paul 1998 (Complexities of social support after PKU diagnosis)
Supplementary Readings: Bowcock 2007, Frank 2005, Taylor 2009

Note:: Complete draft of final portfolio selection due by uploading to blog (as a pdf) for instructor and peer comments (using the guest username and password supplied by the instructor).

(5/5) 14a. Popular and lay epidemiology and health-based social movements
Idea: The traditional subjects of epidemiology become agents when: a. they draw attention of trained epidemiologists to fine scale patterns of disease in that community and otherwise contribute to initiation and completion of studies; b. their resilience and reorganization of their lives and communities in response to social changes displaces or complements researchers' traditional emphasis on exposures impinging on subjects; and c. when their responses to health risks displays rationalities not taken into account by epidemiologists, health educators, and policy makers.
Common readings and cases: Brown 1992 (Popular epidemiology), Krieger (2011)
Supplementary Readings: Black 2001, Brown 2006, Davison 1991, Epstein 1995, Lawlor 2003, Mehdipanah 2013, Panofsky 2011, Schienke 2001

14b. Taking Stock of Course: Where have we come and what do we need to learn to go further?
Idea: In order to move ahead and continue developing, it is important to take stock of what went well and what needs further work.
- Comparison of initial profiles and current position. Revision of profiles into plans for personal and professional development.
- Narrative course evaluations, accessed via http://bit.ly/CCTEvals.

No class, 5/12. Portfolios due by adding the pdf to the blog post for your draft portfolio.

V. Bibliography

Link to access password-protected readings
See also:

- searchable compilation of syllabi from epidemiology courses bookmarked at http://www.diigo.com/user/epicourse/syllabus.
- readings from Prof. Hayman's course on social determinants of health disparities

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