

History and Philosophy of Epidemiology (EPID 891)  
Fall 2015, Wednesdays 1:25-3:15pm, 1303 McGavran-Greenberg Hall  
University of North Carolina at Chapel Hill

**Faculty**

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**Teaching assistant**

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**Objectives**

This class is open to doctoral students in the Department of Epidemiology. It is designed as a forum for exploring issues and debates in the history and philosophy of epidemiology, the objects of knowledge in epidemiology, and the place of epidemiology in public health. Participants should develop a deeper understanding of historical changes in the scope, logic and methods of epidemiology, and of ethical issues facing practicing epidemiologists. In addition, participants should increase the coherence of their personal vision of epidemiology and their ability to articulate this vision in a professional and public context. The course is intended to expand participants' intellectual comfort zones through discussion of the assumptions and cultural traditions of epidemiology and the scientific method.

**Organization**

The semester is organized, roughly, around 3 topics: history, philosophy, and practice. Most sessions consist of a lecture or discussion on a general topic followed by discussion of one or more examples or case studies. Although all students will not be able to attend every class, regular attendance is important because discussion is a critical part of the group learning process.

**Requirements**

-Complete readings and contribute to discussion. Serve as discussion leader for several classes.  
-Post questions, comments and responses on the class discussion board.  
-Write a commentary (approximately 1200-1500 words) on a topic related to the history and philosophy of epidemiology. A commentary is an essay that expresses opinions. We recommend that you adapt one or more themes from the class (e.g., disease definition, statistical inference, use of theory, objectivity, advocacy, conflicts of interest) to one of your areas of interest within epidemiology. A title and abstract for your commentary are due Friday, November 6; include a few bibliographic references if you can. The final commentary is due by December 4. These may be submitted by email to [steve\\_wing@unc.edu](mailto:steve_wing@unc.edu) or by hardcopy in my mailbox in McGavran-Greenberg Hall suite 2102. Please ask in advance if you want an extension of the deadline.

**Readings**

Course text: Kreiger N. Epidemiology and the People's Health: Theory and Context. New York: Oxford University Press, 2011. You may find the hardcover book to be useful as a reference, and its text boxes that extend across multiple pages may be easiest to read in the book. New copies can be ordered locally through Internationalist Books and Community Center, 101 Lloyd St, Carrboro, NC 27510, (919) 942-1740. You can access the text online by following these instructions:

- 1) go to <http://library.unc.edu/>
- 2) in the search bar, type in 'krieger epidemiology' and search
- 3) on the right side of search results, the first result under "books and more" is the electronic copy of the book. Click 'Full text available via the UNC-Chapel Hill Libraries'
- 4) sign in with your onyen
- 5) click on a chapter title to reveal the full text of that chapter.

The detailed syllabus, readings for each session and other material will be available at sakai.unc.edu.

### **Grading**

A P will be given for adequate participation in class and the discussion board and a good commentary. An H will indicate outstanding contributions in one or more of these.

Syllabus outline:

<b>Week</b>	<b>Date</b>	<b>Topic</b>
1	<b>August 19</b>	Introduction: History & philosophy of epidemiology
2	<b>August 26</b>	From 19 <sup>th</sup> Century Origins to 20 <sup>th</sup> Century Debates: Classification and causation
3	<b>September 2</b>	Early 20 <sup>th</sup> Century: Epidemiology and public health activism
4	<b>September 9</b>	Statistical Imprinting: Shaping of science and society
5	<b>September 16</b>	Reification in Science: Randomization as a tool, chance as a cause
6	<b>September 23</b>	Modern Epidemiology: Individuals and populations
7	<b>September 30</b>	Philosophy of Science: Demarcation and change in science and epidemiology
8	<b>October 7</b>	Objectivity in Science and Epidemiology: Construction of scientific knowledge
9	<b>October 14</b>	Epidemiologic Transitions: Transformation of disease in populations
10	<b>October 21</b>	Biomedical vs. Population Approaches to Public Health: The causes of cases and the causes of incidence
11	<b>October 28</b>	Epidemiology in Court
12	<b>November 4</b>	Global Public Health: Epidemiology in low-resource settings
13	<b>November 11</b>	Peer Review and Authorship: Theory and practice of creating the scientific literature
14	<b>November 18</b>	Funding and Scientific Knowledge: Conflicts of interest in epidemiology
15	<b>December 2</b>	Epidemiology, Policy and Advocacy: Epidemiology in practice

Note: readings for each topic are listed in the detailed syllabus.

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**1 August 19 Introduction: History & philosophy of epidemiology**

Kreiger, Chapter 1: Does Epidemiologic Theory Exist? On Science, Data, and Explaining Disease Distribution

**2 August 26 From 19th Century Origins to 20th Century Debates: Classification and causation**

Hamlin C. Could you starve to death in England in 1839? The Chadwick-Farr controversy and loss of the “social” in public health. *Am J Public Health.* 1995;85:856-866.

Krieger, Chapter 3: Epidemiology Emerges: Early Theories and Debating Determinants of Disease Distribution – Poison, Filth, Class, & Race (1600-1900)

For further reading:

Jutel A. Classification, disease, and diagnosis. *Persp Biol Med* 54:189-205, 2011.

Krieger, Chapter 2: Health in the Balance: Early Theories about Patterns of Disease Occurrence

Varela M, Ruiz-Esteban R, Mestre de Juan MJ. Chaos, fractals, and our concept of disease. *Persp Biol Med* 53:584-95, 2010.

**3 September 2 Epidemiology in the Early 20<sup>th</sup> Century: Epidemiology and public health activism**

Terris M. C.-E. A. Winslow: Scientist, Activist, and Theoretician of the American Public Health Movement Throughout the First Half of the Twentieth Century. *Journal of Public Health Policy*, Vol. 19, No. 2 (1998), pp. 134-146

Brown ER. Public health in imperialism: Early Rockefeller programs at home and abroad. *American Journal of Public Health.* 66(9):897-903, 1976.

Krieger, Chapter 4: Epidemiology Expands: Germs, Genes, and the (Social) Environment (1900-1950)

For further reading:

Rosner D, Markowitz G. C.-E. A. Winslow: Scientist, Activist, and Theoretician of the American Public Health Movement Throughout the First Half of the Twentieth Century: Commentaries. *Journal of Public Health Policy*, Vol. 19, No. 2 (1998), pp. 147-159.

Fee E, Green B. Social Reform: Women in Public Health. *Journal of Public Health Policy*, Vol. 10, No. 2 (1989), pp. 161-177.

#### **4 September 9 Statistical Imprinting: Shaping of science and society**

Hacking I. Chapter 1: The Argument, pp 1-10. In: *The Taming of Chance*. New York: Cambridge University Press, 1990.

Gigerenzer G, Swijtink Z, Porter T, Daston L, Beatty J, Kruger L. Chapter 4: Chance and life: controversies in modern biology (pp. 123-162); and Chapter 8: The implications of chance (pp. 271-292). In *The Empire of Chance: How Probability Changed Science and Everyday Life*. New York: Cambridge University Press, 1989.

#### **5 September 16 Reification in Science: Randomization as a tool, chance as a cause**

Rothman KJ. Statistics in nonrandomized studies. *Epidemiology* 1990; 1: 417-418.

Lewontin R, Levins R. Let the numbers speak. *International Journal of Health Services*. 30:873-877, 2000.

Zeger SL. Statistical reasoning in epidemiology. *American Journal of Epidemiology*. 134:1062-66, 1990.

##### For further reading:

Salsburg DS. The religion of statistics as practiced in medical journals. *Am Statistician* 1985;39:220-223.

Doll R, Peto R. Avoidable risks of cancer in the U.S. "Role of genetics, luck, and age" *J Natl Cancer Inst* 1981; 66: 1202-1205 (out of full article, pp. 1191-1308).

#### **6 September 23 Modern Epidemiology: Individuals and populations**

Miettinen OS. Preface; Acknowledgments; Table of Contents; and Chapter 1: The study of occurrence problems in medicine: Introduction. In: *Theoretical Epidemiology: Principles of Occurrence Research in Medicine*. New York: John Wiley and Sons, 1985:vii-xxii, 1-19.

Morris JN. Recapitulation; General (final chapter), pp 274-278. In: *Uses of Epidemiology* (second edition). London: E. & S. Livingstone LTD., 1964.

Kreiger, Chapter 5: Contemporary Mainstream Epidemiologic Theory: Biomedical and Lifestyle

##### For further reading:

Pearce N. Traditional epidemiology, modern epidemiology, and public health. *Am J Public Health*. 1996 86(5), 678-84.

Susser M, Susser E. Choosing a future for epidemiology: I. Eras and paradigms. *Am J Public Health* 1996; 86:668-673.

Susser M, Susser E. Choosing a future for epidemiology: II. From black box to Chinese boxes and eco-epidemiology. *Am J Public Health* 1996;86:674-677.

## **7 September 30 Philosophy of Science: Demarcation and change in science and epidemiology**

Maxwell SE, Delaney HD. Chapter 1: The logic of experimental design. In: *Designing Experiments and Analysing Data: A Model Comparison Perspective*. Belmont, CA: Wadsworth Publishing Co, 1990:3-24. (Although the remainder of the chapter, “Threats to the Validity of Inferences from Experiments” (pp 25-35) is also included in the online excerpt and is a good introduction to how validity is addressed in the field of psychology, we will not focus on this in class)

Bhopal R. Paradigms in epidemiology textbooks: In the footsteps of Thomas Kuhn. *Am J Public Health* 1999;89:1162-1165.

Amsterdamska, O. Demarcating epidemiology. *Science, Technology, & Human Values* 2005;30:17-51.

(Revisit Krieger, Chapter 1, for this class)

For further reading:

Kuhn TS. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press, 1962, 1970. <https://www.lri.fr/~mbl/Stanford/CS477/papers/Kuhn-SSR-2ndEd.pdf>; see especially Chapter 3: The nature of normal science, and Chapter 10: Revolutions as changes of world view.

## **8 October 7 Objectivity in Science and Epidemiology: Construction of scientific knowledge**

Hubbard R. Part 1: How do we know? (Introduction); Chapter 1: Science in context; Chapter 2: Fact making and feminism. In: *The Politics of Women's Biology*. New Brunswick, NJ: Rutgers University Press, 1990:7-34.

Keller EF. Science and its critics. *Academe* 1995 (September-October):10-15.

Parascandola, M. Objectivity and the neutral expert. *Journal of Epidemiology and Community Health* 2003;57:3-4.

For further reading:

Greene G. Richard Doll and Alice Stewart: Reputation and the Shaping of Scientific “Truth.” *Perspect Biol Med*. 2011;54(4):504-531. doi:10.1353/pbm.2011.0042.

Wing S, Richardson D, Stewart A. The relevance of occupational epidemiology to radiation protection standards. *New Solut*. 1999;9(2):133-151.

## **9 October 14      Epidemiologic Transitions: Transformation of disease in populations**

Barrett R, et al. Emerging and re-emerging infectious diseases: the third epidemiologic transition. *Annual Review of Anthropology* 1998;27:247-271.

Weiss RA, McMichael AJ. Social and environmental risk factors in the emergence of infectious diseases. *Nature Medicine* 2004;10(Supplement):S70-S76.

McKeown T. Medical issues in historical demography. *International Journal of Epidemiology* 2005;34:515-520 [originally published 1971].

Omran A. The epidemiologic transition: A theory of the epidemiology of population change. *Milbank Memorial Fund Quarterly*, 1971;49:509-38 (reprinted 2005).

### For further reading:

Weisz G, Olszynko-Gryn J. The Theory of Epidemiologic Transition: the Origins of a Citation Classic. *Journal of the History of Medicine and Allied Sciences*, 2010;65:287-326.

## **10 October 21      Biomedical vs. Population Approaches to Public Health: The causes of cases and the causes of incidence; Guest speaker: Beverly Rockhill**

Rockhill B. Privatization of risk. *American Journal of Public Health*. 2001;91:365-368.

### Case study: genetic testing

Petricoin EF, et al. Use of proteomic patterns in serum to identify ovarian cancer. *Lancet* 2002;359:572-577.

Rockhill B. Proteomic patterns in serum to identify ovarian cancer (letter). *Lancet* 2002;360:169.

### For further reading:

Schwartz S, Diez-Roux A V. Commentary: causes of incidence and causes of cases--a Durkheimian perspective on Rose. *Int J Epidemiol*. 2001;30(3):435-439. doi:10.1093/ije/30.3.435

## **11 October 28      Epidemiology in court**

Dryer N. [An epidemiologic view of causation and how it differs from the legal](#). International Association of Defense Counsel, Frontline, PBS.

Haack S. Trial and error: the Supreme Court's philosophy of science. *Am J Public Health*. 2005;95:S66-S73.

Wing S. Objectivity and ethics in environmental health science. *Environmental Health Perspectives*, 111:1809-1818, 2003.

## **12 November 4      Global Public Health: Epidemiology in low-resource settings**

Fassin, D (2010) That obscure object of global health. Chapter 4 in *Medical Anthropology at the Crossroads: Histories, Activisms and Futures*. Duke University Press.

Benatar, S and Upshur, REG (2011) What is global health? in Benatar, and Brock, G (eds.) Global Health and Global Health Ethics. Cambridge and New York: Cambridge University Press.

Provenzano AM, Graber LK, Elansary M, Khoshnood K, Rastegar A, Barry M. Short-term global health Research projects by US medical students: Ethical challenges for partnerships. *Am. J. Trop. Med. Hyg.*, 83(2), 2010, pp. 211–214.

Eyal N, Hurst SA. Physician brain drain: Can nothing be done? *Public Health Ethics* 1:180-92, 2008.

VanderWeele TJ, Robinson WR. On the Causal Interpretation of Race in Regressions Adjusting for Confounding and Mediating Variables. *Epidemiology*. 2014;25(4):473-484

### **► Commentary topic title and abstract due Friday, November 8**

#### **13 November 11 Peer Review and Authorship: Theory and practice of creating the scientific literature**

International Committee of Medical Journal Editors. Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Ethical Considerations in the Conduct and Reporting of Research: Authorship and Contributorship. [http://www.icmje.org/ethical\\_1author.html](http://www.icmje.org/ethical_1author.html), accessed August 31, 2009.

Armstrong JS. Peer review for journals: Evidence on quality control, fairness, and innovation. *Science and Engineering Ethics* 1997;3:63-84.

Greenberg SA. How citation distortions create unfounded authority: analysis of a citation network. *BMJ* 2009 339:b2680.

Flanagin A, Carey L, Fontanarosa P, Phillips S, Pace B, Lundberg G, Rennie D. Prevalence of articles with honorary authors and ghost authors in peer-reviewed medical journals. *JAMA* 280:222-224(1998).

#### **Further reading:**

Claxton L. Scientific authorship: Part 2. History, recurring issues, practices, and guidelines. *Mutation Research* 589:31-45(2005).

Committee on Science, Engineering, and Public Policy. On being a scientist: responsible conduct in research. National Academy of Sciences, National Academy of Engineering, Institute of Medicine. National Academy Press, Washington DC, 1995. Available at: <http://www.nap.edu/readingroom/books/obas/>

Calleigh A. Credit and responsibility in authorship. *Academic Medicine* 66:676-677(1991).

Anderson C. Writer's cramp. *Nature* 355:101(1992).

#### **14 November 18 Funding and Scientific Knowledge: Conflicts of interest in epidemiology**

Wing S. Social responsibility and research ethics in community driven studies of industrialized hog production. *Environmental Health Perspectives* 2002: 110:437-444.

Wing S. When research turns to sludge. *Academe* 96(6):22-24, 2010.  
<http://www.aaup.org/AAUP/pubsres/academe/2010/ND/feat/wing.htm>

Wing S, Warren C. Big money and public health. *News & Observer*, Raleigh, NC, March 7, 2008.

Rimer B, MacMillan J. Gifts critical to our goals. *News & Observer*, Raleigh, NC, March 14, 2008.

Egilman DS, Druar NM. Corporate versus public interests: Community responsibility to defend scientific integrity. *International Journal of Occupational and Environmental Health*. 17:181-185, 2011.

For further reading:

Proctor, R. Chapter 1: Agnotology. In *Agnotology: the making and unmaking of ignorance*. Stanford, Calif.: Stanford University Press; 2008.

Lilienfeld DE. John Snow: The first hired gun? *American Journal of Epidemiology* 152:4-9, 2000.

Pearce N. Corporate influences on epidemiology. *Int J Epidemiol*. 2008 37:46-53. Responses: Haas J. Commentary: Epidemiology and the pharmaceutical industry: an inside perspective. *Int J Epidemiol*. 2008 37:53-55; White A, Robinson N, Egger P, Davis K, Weil J, Bowlin S. Commentary: Collaboration between industry-based and academic epidemiologists. *Int J Epidemiol* 37:56-57; Greenland S. Commentary: Addressing corporate influence through ethical guidelines. *Int J Epidemiol* 37:57-59; Phillips CV. Commentary: Lack of scientific influences on epidemiology. *Int J Epidemiol* 37:59-64; Pearce N. Response: The distribution and determinants of epidemiologic research. *Int J Epidemiol* 37:65-68.

Bekelman JE, Li Y, Gross CP. Scope and impact of financial conflicts of interest in biomedical research: a systematic review. *JAMA* 2003; 289: 454-465.

## **15 December 2 Epidemiology, Policy and Advocacy: Epidemiology in practice**

Mackenbach JP. Politics is nothing but medicine at a larger scale: reflections on public health's biggest idea. *J Epidemiol Community Health*. 2009 63:181-184.

Levins R. One foot in, one foot out. *New Solutions*. 2008 18:121-128.

Levins R. Whose scientific method? Scientific methods for a complex world. *New Solut*. 2003;13(3):261-274. doi:183609349.

Rothman KJ, Poole C. Science and policy making. *American Journal of Public Health* 1985;75:340-341.