SOCIAL DETERMINANTS OF HEALTH RESEARCH METHODS

EPI 590N and HSERV 590N *(1-5-5)*

INSTRUCTORS:

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DATA CONSULTANT:

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COURSE SCHEDULE:

- Tuesdays 10:30 – 11:50 am Room HSB T360A
- Thursdays 10:30 – 11:50 am Room HSB T360A

COURSE WEBSITE:

http://depts.washington.edu/cphhd/SDH%20Course/SDHResearchMethodsCourse.htm

COURSE DESCRIPTION:

This 3-unit course will explore study-design, measurement, and analytic issues applicable to research into the social determinants of health. Twice-weekly graduate-level seminar offered to students with a basic knowledge of epidemiologic and biostatistical principles. The course will consist of 15 lectures and 5 journal-article critique sessions. Lectures are conducted by faculty from the Departments of Epidemiology, Health Services, and Biostatistics.

Five journal-article critique sessions will be part of the regular course schedule. Students will be assigned to 1 of the 5 sessions at the beginning of the course to create groups of 3-4 students. Each group will be responsible for serving as discussants for 1 of the 5 critique sessions. Groups will create 3-5 discussion questions and will provide these discussion questions a week prior to the discussion. Each group member will submit a critical review of the journal articles(s). Primary and secondary discussant roles will be assigned to group members on the day of the discussion.

PREREQUISTES:

Prerequisites include either EPI 511 or the 512/513 series *and* either the BIOST 511/512 series or the 517/518 series *or* instructors permission for those student who already have an epidemiology and biostatistics background.

COURSE MATERIALS:

Most of the readings are posted on the UW Health Sciences Library E-Reserves at: https://eres.lib.washington.edu/. Material will be listed under EPI 590N.

Four books have been placed on 2-hour holds in the Health Sciences Library for winter quarter and include the following:

Biostatistics: a methodology for the health sciences. Gerald van Belle et al.

Neighborhoods and health. 2003. Edited by Ichiro Kawachi, Lisa F. Berkman

Social epidemiology. 2000. Edited by Lisa F. Berkman, Ichiro Kawachi

Causal inference. 1986. Edited by Kenneth Rothman.

ASSESSMENT:
Students will be evaluated on 4 criteria for an overall course grade.

1) Participation in class discussion *(10% of final grade)*
2) Journal article critique (1 of 5 sessions)
    a) Critical summary (1-2 pages) of article(s) *(10% of final grade)*
        i) What was done?
        ii) How was it done?
        iii) Why was it done?
        iv) What can be concluded?
    b) Development of 3-5 questions for class discussion in small groups *(5% of final grade).*
3) Short homework assignments *(15% of final grade)*
    a) Interpretation of ecologic data analysis output. Due Thursday, February 10.
    b) Interpretation of multi-level data analysis output. Due Tuesday, February 22.
    c) Interpretation of longitudinal data analysis output. Due Thursday, March 3.
4) Development of short research proposal addressing the social determinants of health using outline provided by instructors (11 double-spaced pages maximum). The proposal is due in 4 parts.
    a) Select title and describe specific aims *(5% of final grade)*. Due Tuesday, January 11.
    b) Develop conceptual model *(10% of final grade)*. Due Thursday, January 20.
    c) Provide background section and describe study design and research hypotheses, describe data collection and evaluate key measures *(25% of final grade)*. Due Tuesday, February 8.
    d) Develop analysis section and write up interpretation of the data using assuming the hypothesis is support and assuming hypothesis was not supported *(20% of final grade)*. Due Tuesday, March 15.

TARGET DATES:
Tuesday, January 11: Research proposal title and specific aims

Thursday, January 20: Research proposal's conceptual model

Tuesday, February 8: Research proposal sections A, B, C (optional), and D.1-D.4

Thursday, February 10: Homework assignment #1

Tuesday, February 22: Homework assignment #2

Thursday, March 3: Homework assignment #3

Tuesday, March 15: Research proposal sections D.5-D.8

COURSE OUTLINE:

Session	Session Description and Learning Objectives	Lecturers
#1 **Tue** **Jan 4**	*Introduction and Overview* 1. Appreciate the role that the social determinants of health (SDH) play in health at an individual and community level 2. Become familiar with the major concepts in SDH research 3. Develop an appreciation for the unique research methods necessary to study of SDH 4. Course logistics *Required Readings:* None	Shirley A. A. Beresford, PhD & Nicholas L. Smith, PhD
#2 **Thu** **Jan 6**	*Causality and Conceptual Models* 1. Describe the basic principles underlying the dominant theories of causality 2. Apply these principles to SDH research 3. Distinguish between causal and conceptual models in SDH research 4. Identify the components of a conceptual model, the corresponding unit of analysis, and the interconnecting pathways *Required Readings:* Greenland S, Brumback B. An overview of relations among causal modelling methods. *Int J Epidemiol* 2002;31:1030-7. Kaufman JS, Kaufman S, Poole C. Causal inference from randomized trials in social epidemiology. *Soc Sci Med* 2003;57:2397-409. Kreiger N. Epidemiology and the web of causation: has anyone seen the spider? *Soc Sci Med* 1994;39:887-903. Marmot M. "Multilevel approaches to understanding social determinants." In Berkman LF, Kawachi I: *Social Epidemiology*. New York: Oxford University Press, 2000 (pp. 349-67). *Additional Readings:* Holland PW. Statistics and Causal Inference. *J Am Stat Assoc* 1989;81:945-960. Robins JM. Data, design, and background knowledge in etiologic inference. *Epidemiology* 2001;12:313-20. Rothman KJ. Causal Inference. Chestnut Hill, MA : Epidemiology Resources, 1988	NLS
#3 **Tue** **Jan 11**	*Major Conceptual Models in SDH Research* 1. Become familiar with the major conceptual models that are currently researched *Required Readings:* Reiche EM, Nunes SO, Morimoto HK. Stress, depression, the immune system, and cancer. *Lancet Oncol.* 2004 Oct;5(10):617-25. Galobardes B, Lynch JW, Davey Smith G. Childhood socioeconomic circumstances and cause-specific mortality in adulthood: systematic review and interpretation. *Epidemiol Rev.* 2004;26:7-21. Subramanian SV, Kawachi I. Income inequality and health: what have we learned so far? *Epidemiol Rev.* 2004;26:78-91. Szreter S, Woolcock M. Health by association? Social capital, social theory, and the political economy of public health. *Int J Epidemiol.* 2004 Aug;33(4):650-67. ► Proposal title and specific aims due at the start of class	Ann E. Kurth, CNM, PhD & NLS
#4 **Thu** **Jan 13**	Journal Article Critique #1: Conceptual Models Steptoe A, Kunz-Ebrecht S, Owen N, Feldman PJ, Rumley A, Lowe GD, Marmot M. Influence of socioeconomic status and job control on plasma fibrinogen responses to acute mental stress. *Psychosom Med*. 2003 Jan-Feb;65(1):137-44. Gold R, Kennedy B, Connell F, Kawachi I. Teen births, income inequality, and social capital: developing an understanding of the causal pathway. *Health Place*. 2002 Jun;8(2):77-83.	SAAB & NLS

#5 **Tue** **Jan 18**	*Data Sources* 1. Identify existing data sources available for SDH research 2. Identify the structure of the data in existing data sets and be able to distinguish between group-level variables that represent contextual factors and those that indirectly estimate individual-level data 3. Understand limitations and advantages to using multiple data sources to create analytic data sets *Required Readings:* Mackenbach JP, Bos V, Anderson O, Cardano M, Costa G, Harding S, Reid A, Hemstrom O, Valkonen T, Kunst AE. Widening socioeconomic inequalities in mortality in six Western European countries. *Int J Epidemiol* 2003; 32: 830-839. *Additional Readings:* Hetzel AM. "History and Organization of Vital Statistics System." *National Center for Health Statistics*. 1997. pp. 27- 42 & pp. 58-62. Krieger N. Overcoming the absence of socioeconomic data in medical records: validation and application of census-based methodologies. *Am J Public Health* 1992;82:703-10.	SAAB
#6 **Thu** **Jan 20**	*Selecting a Study Design (part 1)* 1. Identify the primary and unique study designs new to SHD research (unit of analysis; experimental vs. quasi experimental vs. observational; cross-sectional versus prospective/retrospective; ecologic designs) 2. Be able to chose the best study design to fit the conceptual model or model component to be tested 3. Be able to chose the best study design to fit the data available for research 4. Understand the role of randomized studies in SDH research 5. Become familiar with network modeling designs to capture contextual effects *Required Readings:* Campbell DT, Stanley JC. *Experimental and Quasi-Experimental Designs for Research*. Chicago: R. McNally, 1966 (pp. 34-46). Diez-Roux AV. Bringing context back into epidemiology: variables and fallacies in multilevel analysis. *Am J Public Health*. 1998;88:216-22. Koepsell TD. "Epidemiologic issues in the design of community intervention trials." Chapter 6 in: Brownson RC, Petitti DB. *Applied Epidemiology: Theory to Practice*. New York: Oxford University Press, 1998 (pp. 177-211). Kuh D, Ben-Shlomo Y, Lynch J, Hallqvist J, Power C. Life course epidemiology. *J Epidemiol Community Health* 2003;57:778-83. *Additional Readings:* Ben-Shlomo Y, Kuh D. A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives. *Int J Epidemiol* 2003;31:285-93. "Evaluating the Effects of Policies on Health." In Koepsell TD, Weiss NS. *Epidemiologic Methods: Studying the Occurrence of Illness*. Oxford; New York: Oxford University Press, 2003. ► Proposal conceptual model due at the start of class	NLS
#7 **Tue** **Jan 25**	*Selecting a Study Design (part 2)* *Required Readings:* See session #6	Thomas D. Koepsell, MD, MPH & NLS

#8 **Thu** **Jan 27**	*Measurement Issues* 1. Understand the advantages and limitations of individual and group measures in SDH research 2. Understand how measures are selected to represent concepts 3. Become familiar with index measures of exposures and outcomes and how these measures can be constructed and validated 4. Combining data from various sources *Required Readings:* Saunders RP, Pate RR, Felton G, Dowd M, Weinrich MC, Ward DS, Parsons MA, Baranowski T. Development of questionnaires to measure psychosocial children's physical activity. *Prev Med* 1997; 26: 241-247. Raudenbush SW. "The quantitative assessment of neighborhood social environments." In Kawachi I and Berkman LF. *Neighborhoods and Health*. New York, Oxford University Press. 2003. Pp 112-131. Lynch J, Kaplan G. "Socioeconomic position." In Berkman LF and Kawachi I. *Social Epidemiology*. New York, Oxford University Press 2000. pp 13- 35. Diez Roux AV. The study of group-level factors in epidemiology: rethinking variables, study designs, and analytical approaches. *Epidemiol Rev*. 2004;26:104-11. *Additional Readings:* Gordon D. "Area-based deprivation measures – a U.K. Perspective." In Kawachi I and Berkman LF. *Neighborhoods and Health*. New York, Oxford University Press. 2003. Pp 179-207 Mathers CD, Murray CJL, Ezzati M, Gakidou E, Salomon JA, Stein C. Population health metrics: crucial inputs to the development of evidence for health policy. *Population Health Metrics* 2003; 1:6 http://www/pophealthmetrics/content/1/1/6 Armstrong BK. White E, Saracci R. *Principles of exposure measurement in epidemiology*. New York, Oxford University Press. 1992; chapter 1: pp1-21. Krieger N. Comparing individual-based and household-based measures of social class to assess class inequalities in women's health: methodological study of 684 US women. *J Epidemiol Community Health* 1999;53:612-23.	SAAB
#9 **Tue** **Feb 1**	Journal Article Critique #2: Study Design and Measurements Costello EJ, Compton SN, Keeler G, Angold A. Relationships between poverty and psychopathology: a natural experiment. *JAMA*. 2003;290:2023-9. Galea S, Ahern J, Vlahov D, Coffin PO, Fuller C, Leon AC, Tardiff K. Income distribution and risk of fatal drug overdose in New York City neighborhoods. *Drug Alcohol Depend*. 2003;70(2):139-48. Phillips DP, Liu GC, Kwok K, Jarvinen JR, Zhang W, Abramson IS. The Hound of the Baskervilles effect: natural experiment on the influence of psychological stress on timing of death. *BMJ*. 2001;323(7327):1443-6.	NLS & SAAB
#10 **Thu** **Feb 3**	*Analytic Issues (part 1): Ecologic Data* 1. General issues of ecologic data analyses 2. Understanding limitations of interpretation when analyzing potentially confounded data 3. Describe the benefits and drawbacks of using within population sampling to estimate confounding effects of the larger group *Required Readings:* D.A. Freedman. "Ecological inference and the ecological fallacy." *International Encyclopedia for the Social and Behavioral Sciences.* Elsevier (2001) vol. 6 pp. 4027–30. N. J. Smelser and Paul B. Baltes, eds. Morgenstern, H. (1998). Ecologic Studies. In Rothman, K.J. and Greenland, S. (Eds.), *Modern Epidemiology, Second Edition*, pp. 459-480. Lipincott-Raven. *Additional Readings:* Greenland, S. (1992). Divergent biases in ecologic and individual-level studies, *Stats Med*, 11, 1209-23.	Jon Wakefield, PhD & SAAB

#11 **Tue** **Feb 8**	*Analytic Issues (part 2): Ecologic Data Review and Multi-level Data* 1. Review of ecologic data analyses (30 minutes) and provide homework 2. Introduction to analytic issues of multi-level research *Required Readings:* Blakely TA, Woodward AJ. Ecological effects in multi-level studies. *Journal of Epidemiology and Community Health* 2000,54:367-374. Duncan C, Jones K, Moon G. Context, composition and heterogeneity: Using multilevel models in health research. *Soc Sci Med* 1998, 46:97-117. (especially pages 97-105; 112-114) Diez-Roux AV. A glossary for multilevel analysis. *Journal of Epidemiology and Community Health* 2002, 56: 588-594. Diez-Roux AV. Multilevel analysis in public health research. *Annual Review of Public Health* 2000, 21:171-92. ► Proposal sections A, B, C (optional) and D1-D4 due at the start of class	NLS & SAAB
#12 **Thu** **Feb 10**	*Analytic Issues (part 3): Confounding and Effect Modification with Multi-level Data* 1. General issues of confounding in multi-level research studies 2. General issues of effect modification in multi-level research studies *Required Readings:* See session #11. ► Homework assignment #1 due at the beginning of class	Lianne Sheppard, PhD & SAAB
#13 **Tue** **Feb 15**	*Analytic Issues (part 4): Analyzing Multi-level Data* 1. Understand basic approaches to analyzing multi-level data using hierarchical models 2. Become familiar with other analytic methods to address multi-level data *Required Readings:* See session #12.	Xiao-hua Andrew Zhou, PhD & NLS
#14 **Thu** **Feb 17**	*Analytic Issues (part 5): Multi-level Data Review and Structural Equation Models* 1. Review of multi-level data analysis (30 minutes) and provide homework 2. General issues of structural equation modeling *Required Readings:* Pearl J. *Causality: Models, Reasoning, and Inference*. "Causality and Structural Models in Social Science and Economics" (Chapter 5), Cambridge: Cambridge University Press, 2000, pp 133-171.	Ken Rice, PhD & NLS
#15 **Tue** **Feb 22**	Journal Article Critique #3: Multi-level Research Studies Merlo J, Ostergren PO, Hagberg O, Lindstrom M, Lindgren A, Melander A, Rastam L, Berglund G. Diastolic blood pressure and area of residence: multilevel versus ecological analysis of social inequity. *J Epidemiol Community Health*. 2001;55:791-8. ► Homework assignment #2 due at the beginning of class	NLS & SAAB
#16 **Thu** **Feb 24**	*Analytic Issues (part 6): Longitudinal Data* 1. Understand the general issues of longitudinal data analysis using follow-up data from long-standing cohorts 2. Identify threats to validity when using longitudinal data 3. Identify analytic techniques to evaluate robustness of findings *Required Readings:* TBA	Brian G. Leroux, PhD & SAAB

#17 Tue Mar 1	*Analytic Issues (part 7): Longitudinal Data Review and Survey Data Analysis Modeling* 1. Review of longitudinal data analysis (30 minutes) and provide homework 2. Understand the special qualities of survey data 3. Using national survey data to standardize populations *Required Readings:* Bierman, AS, Bubolz TA. "Secondary Analysis of Large Survey Databases" in Max, MB, Lynn, J, eds *Symptom Research: Methods and Opportunities* http://symptomresearch.nih.gov/chapter_20/ (not on e-reserve) Brogan, DJ. Pitfalls of Using Standard Statistical Software Packages for Sample Survey Data, Encylopedia of Biostatistics. Reprinted at http://www.fas.harvard.edu/~stats/survey-soft/donna_brogan.html (on e-reserve) Hendricx, J. *The Impact of Weights on Standard Errors*. http://www.asc.org.uk/Events/Apr02/Full/Hendrickx.doc (on e-reserve) *Additional Readings:* Also look at the NCHS and ICPSR websites http://www.cdc.gov/nchs	Thomas Lumley, PhD & NLS
#18 Thu Mar 3	Journal Article Critique #4: Longitudinal TBD ► Homework assignment #3 due at the beginning of class	NLS & SAAB
#19 Tue Mar 8	*Interpretation of Research Findings* 1. Interpreting the conceptual model in light of the research findings 2. Translation of research findings into improved health 3. Role of epidemiologists and health services researchers in SDH research *Required Readings:* Mackenbach JP, Bakker MJ; European Network on Interventions and Policies to Reduce Inequalities in Health. Tackling socioeconomic inequalities in health: analysis of European experiences. *Lancet.* 2003;362:1409-14. Kindig D, Day P, Fox DM, Gibson M, Knickman J, Lomas J, Stoddart G. What new knowledge would help policymakers better balance investments for optimal health outcomes? *Health Serv Res*. 2003;38:1923-37. Susser M. Should the epidemiologist be a social scientist or a molecular biologist? *Int J Epidemiol*. 1999;28:S1019-22.	SAAB & NLS
#20 Thu Mar 10	Journal Article Critique #5: General Overview Kramer MS, Goulet L, Lydon J, Seguin L, McNamara H, Dassa C, Platt RW, Chen MF, Gauthier H, Genest J, Kahn S, Libman M, Rozen R, Masse A, Miner L, Asselin G, Benjamin A, Klein J, Koren G. Socio-economic disparities in preterm birth: causal pathways and mechanisms. *Paediatr Perinat Epidemiol*. 2001;15:104-23. Hillemeier MM, Lynch J, Harper S, Raghunathan T, Kaplan GA. Relative or absolute standards for child poverty: a state-level analysis of infant and child mortality. *Am J Public Health*. 2003;93:652-7. Coulton CJ, Korbin JE, Su M. Neighborhoods and child maltreatment: a multi-level study. *Child Abuse Negl*. 1999;23:1019-40.	SAAB & NLS
Final Tue Mar 15	► Full proposal due at 9:00 am.	