OCCUPATIONAL EPIDEMIOLOGY (EPIDEM M 261, ENV HLT M260)
Beate Ritz and *Niklas Krause*

Course Description: This course will introduce students to key occupational health issues and principles of occupational epidemiologic research. The epidemiologic methods employed to study adverse human health effects due to exposures encountered in the work place will be presented in the context of current occupational health issues. Both common and special study designs, exposure assessment and analysis methods will be discussed, including participatory research strategies for special vulnerable worker populations and how to deal with healthy worker selection biases.

Format: 4 unit course: interactive 3 hour combined lecture/seminar once a week.
Time and Location: Wed 8:00-10:50 a.m., CHS 71-257 B

Required Texts:
(1) *Textbook:* ***Research Methods in Occupational Epidemiology, Second Edition****,* by Harvey Checkoway, Neil Pearce, and David Kriebel, 2004, ISBN 0-19-509242-2, Oxford University Press, New York, New York. Focuses on concepts and methods most relevant for occupational epidemiology.
(2) *Textbook:* ***Occupational and Environmental Health, Sixth Edition***, by Barry S. Levi, David H. Wegman, Sherry L. Baron, Rosemary K. Soka***s,*** 2011, ISBN 9780-0-19-539788-8, Oxford University Press, New York, New York. This textbook provides an introduction to the context of occupational health, gives an overview of the most common occupational hazards and disease groups with typical examples, and describes the role of epidemiology and other public health fields in the recognition, assessment and prevention of work-related disease and injury. Free downloadable online.
(3) *Articles:* Additional journal articles will be assigned to supplement textbook chapters and will be available for download from the course website.
Upon request, textbooks will be put on reserve in the Biomedical Library (12-077 CHS) and will also become available at the Health Sciences Store (Patio 13-170 CHS, ph. 5-7721 ext 3). Online vendors may sell new and used books at lower prices, however, the store will match online prices for new books if you show proof of online availability.

Course Requirements: This is a combined seminar/lecture and includes class discussions and active student participation. Students will be required to read assigned textbook chapters and articles, prepare questions regarding these materials, and discuss the content of these readings in class. Regular attendance of class is expected. Each student will be required to present a summary and critical evaluation of an assigned journal article (5-10 minute summary, 5-10 power points slides that need to be submitted by email prior to class). Presenting students will be responsible for identifying 3 questions and discussion points regarding major epidemiologic and occupational health issues raised by the manuscript. The final grade will be based on the following breakdown: 25% student participation / homework incl. on-time delivery, 25% for presentation, 25% for part I and 25% for part II of final take-home exam. See attached guidelines.

Contact information: If you would like to make an appointment for office hours or need to contact us for any other reason, please use the following telephone numbers or email addresses:

Dr. Beate Ritz : On-campus (310) 206-7458 Email: **britz@ucla.edu**
Dr. Niklas Krause: On-campus (310) 825-2079 Email: **niklaskrause@ucla.edu**

ASPH MPH Competencies Covered in Class: Core ASPH Competencies, and Epidemiology Specific MPH Competencies (with focus on occupational health)

Course Objectives	Specific (Occupational) Epidemiology Competencies: ASPH Core MPH Competencies	ASPH Core MPH Competencies
To be able to read and critically evaluate occupational epidemiologic research.	**A1**. Judge, critique and interpret reports of individual epidemiological studies; evaluate strengths and limitations of epidemiologic reports. **C5.** Identify potential sources of systematic error (bias) as well as random error	**D.9.** Draw appropriate inferences from epidemiologic data. **D.10.** Evaluate the strengths and limitations of epidemiologic reports.
To understand acute and chronic human health effects from toxic agents and unfavorable work conditions in the workplace.	**C2.** Develop and assess appropriate data collection instruments (e.g., questionnaires, physical exam, lab assays, etc.) and evaluate the use of questionnaires and measurement instruments in collection of data to maintain internal validity **C3.** Identify an appropriate target population for investigating the research question **I.1.1**. Describe major direct and indirect human health and safety effects of major environmental or occupational agents or conditions. **I.1.2.** Identify the most important disease burdens with major environmental or occupational risk factors and the environmental or occupational risk factors that produce the most disease burden in either the general population or in heavily affected subgroups. **I.1.3.** Identify significant gaps in the current knowledge base concerning health effects of environmental or occupational agents. **I.4.2.** Describe genetic, biological, psychosocial, and socio-economic factors that may affect susceptibility to adverse health outcomes following exposure to environmental hazards	**D.1.** Identify key sources of data for epidemiologic purposes. **D.3.** Describe a public health problem in terms of magnitude, person, time and place.
To understand and apply epidemiologic principles of research; be able to explain concepts related to study design/analysis.	**E1.** Prepare presentation materials including outlines, slides, posters, and powerpoint presentations **F2.** Recognize ethical issues that arise in epidemiological research	**D.6**. Apply the basic terminology and definitions of epidemiology. **D.8.** Communicate epidemiologic information to lay and professional audiences.
To learn how occupational epidemiology study results influence policies and understand the potential for /implications of preventive actions	**B.5.** Specify approaches for assessing, preventing and controlling occupational hazards that pose risks to human health and safety. **I.6.2.** Identify major state, federal, intern. regulatory programs or authorities for occupational or environmental health. **D.4.** Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues.	**D1.** Make reasonable inferences from results of analysis of observational and analytic studies **D2.** Deduce epidemiologic and public health implications of research results and propose subsequent studies **D3.** Make appropriate policy recommendations on the basis of research results and interpretation

Course Schedule and Required Readings (Note: subject to change – please check course website before each class):

Week 1 Jan 9 Krause	**History of Occupational Health and Global Burden of Occupational Disease and Injury** ***Required readings (copies are posted on the course website for download)*:** (1) *Checkoway textbook:* Chapter 1 pages 3-16: Introduction (2) *Levi textbook:* Chapter 1 pages 3-22: Occupational and Environmental Health: Twenty-First Century Challenges and Opportunities ***SELECT AND READ ONE of the following original papers:*** (3) Leigh, Paul, Occupational injury and illness in the United States. Estimates of costs, morbidity, and mortality, Arch Int Med 1999;157(14):1557-68 (4) Leigh, JP, Economic burden of occupational injury and illness in the United States, Milbank Quarterly, 2011; 89(4): 728-72 (5) Leigh, James; Macaskill, Petra; Kuosma, Eeva; Mandryk, John. Global Burden of Disease and Injury Due to Occupational Factors. *Epidemiology*, 1999 Sep, 10(5):626-631 (6) Nelson DI et al., The global burden of selected occupational diseases and injury risks: Methodology and summary, Am J Industrial Medicine 2005;48(6):400-418
Week 2 Jan 16 Ritz	**Study Design Issues in Occupational Epidemiology: Occupational Cohort and (Nested) Case Control Studies Application: The role of chemical and radiation exposure for cancer mortality** ***Required readings*:** (1) *Checkoway textbook*: Chapter 3 pages 59-81: Overview of study designs (2) *Checkoway textbook*: Chapter 5 pages 123-140: Cohort studies (3) *Checkoway textbook*: Chapter 6 pages 179-200: Case-control studies (4) Ritz B, Morgenstern H, Froines J, Young B, Effects of Exposure to External Ionizing Radiation on Cancer Mortality in Nuclear Workers Monitored for Radiation at Rocketdyne/Atomics International. *AJIM* 1999, Vol.35: 21-31. (5) Zhao Y* Krishnadasan A* Kennedy N, Morgenstern H. Ritz B. Estimated effects for solvents and mineral oils and cancer mortality and incidence. Am J Ind Med. 2005;48(4):249-58. ***Supplemental Readings:*** (6) *Levi textbook:* Chapter 17: pages 366-397: Cancer (7) *Levi textbook:* Chapter 12C: pages 258-280: Ionizing and non-ionizing radiation (8) Krishnadasan A*, Kennedy N, Zhao Y, Morgenstern H, Ritz B. Nested Case-Control Study of Occupational Chemical Exposures and Prostate Cancer in Aerospace and Radiation Workers. In Am J Ind Med. 2007;50(5):383-90. ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (9) Fisher JL, Pettersson D, Palmisano S, Schwartzbaum JA, Edwards CG, Mathiesen T, Prochazka M, Bergenheim T, Florentzson R, Harder H, Nyberg G, Siesjö P, Feychting M. Loud noise exposure and acoustic neuroma. Am J Epidemiol. 2014 Jul 1;180(1):58-67. (10) Turner MC, et al. Occupational Exposure to Extremely Low-Frequency Magnetic Fields and Brain Tumor Risks in the INTEROCC Study. Cancer Epidemiol Biomarkers Prev. 2014 Sep;23(9):1863-72.

Week 3 **Jan 23** **Ritz**	**Occupational Exposure Assessment I:** **JEM: job classification and job exposure matrix methodological issues including information bias** ***Required Readings:*** (1) *Checkoway textbook*: Chapter 2 pages 17-57: Characterizing the workplace environment (2) *Checkoway textbook*: Chapter 5 pages 155-178: Job classification; disease induction and latency (3) Bouyer, J; Hemon, D. Retrospective Evaluation of Occupational Exposure in Population-Based Case-Control Studies: General Overview with Special Attention to Job Exposure Matrices. International Journal of Epidemiology, 1993, 22(6)(Suppl. 2):S57-S64. (4) Benke G1, Sim M, Forbes A, Salzberg M. Retrospective assessment of occupational exposure to chemicals in community-based studies: validity and repeatability of industrial hygiene panel ratings. Int J Epidemiol. 1997 Jun;26(3):635-42. ***Supplemental Readings:*** (5) *Levi textbook:* Chapter 2: pages 23-54: Recognizing and preventing occupational and environmental disease and injury (6) Teschke K1, Olshan AF, Daniels JL, De Roos AJ, Parks CG, Schulz M, Vaughan TL. Occupational exposure assessment in case-control studies: opportunities for improvement. Occup Environ Med. 2002 Sep;59(9):575-93; discussion 594. (7) Fritschi L1, Nadon L, Benke G, Lakhani R, Latreille B, Parent ME, Siemiatycki J. Validation of expert assessment of occupational exposures. Am J Ind Med. 2003 May;43(5):519-22. ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (8) Lillienberg L, Dahlman-Höglund A, Schiöler L, Torén K, Andersson E. Exposures and asthma outcomes using two different job exposure matrices in a general population study in northern Europe. Ann Occup Hyg. 2014 May;58(4):469-81. (9) Doolan GW, Benke G, Giles GG, Severi G, Kauppinen T. A case control study investigating the effects of levels of physical activity at work as a risk factor for prostate cancer. Environ Health. 2014 Aug 7;13:64. (10) Fernandez RC, Peters S, Carey RN, Davies MJ, Fritschi L. Assessment of exposure to shiftwork mechanisms in the general population: the development of a new job-exposure matrix. Occup Environ Med. 2014 Oct;71(10):723-9. **Student Presentations (max 2): TBD**
Week 4 **Jan 30** **Krause**	**Occupational Exposure Assessment II:** **Biomechanical risk factors and ergonomic exposure assessment methods.** **Application: The role of ergonomic factors in the etiology of musculoskeletal and cardiovascular disorders.** ***Suggested Readings:*** (1) *Levi textbook*: Chapter 16 pages 335-365: Musculoskeletal disorders (2) *Levi textbook:Chapter 23 pages 492-504:* Cardiovascular disorders (3) *Levi textbook:* Chapter 27 pages 591-605: Occupational ergonomics: promoting safety and health through work design ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (4) Rempel DM, Krause N, Golberg r, Benner D, Hudes M, and Goldner GU, *A randomised controlled trial evaluating the effects of two*

	workstation interventions on upper body pain and incident musculoskeletal disorders among computer operators. Occup Environ Med, 2006. 63(5): p. 300-306. (5) Krause N, Brand RJ, Kaplan GA, Kauhanen J, Malla S, Tuomainen TP, Salonen JT, Occupational physical activity, energy expenditure, and 11-year progression of carotid atherosclerosis, Scand J Work Environ Health 2007;33(6):405-24 (6) Krause N, Rugulies R, Ragland DR, Syme SL, Physical workload, ergonomic problems, and incidence of low back injury: a 7.5-year prospective study of San Francisco transit operators, Am J Ind Med 2004;46:570-585 **Student Presentations (max 2): TBD**

Week 5 Feb 6 Ritz	**Reading occupational Epi papers** **Possibly: Nanoparticle exposures Tian Xian…** ***Required Readings:*** ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** **Student Presentations (max 2): TBD**
Week 6 Feb 13 Krause	**Occupational Exposure Assessment (III): Observer-based versus self-reported measures of psychosocial and organizational factors. Application: The role of psychosocial job factors in the etiology of musculoskeletal and cardiovascular diseases.** ***Required Readings:*** (1) *Levi textbook* Chapter 14 pages 296-312: Occupational Stress (2) Landsbergis P, Theorell T, Schwartz J, Greiner BA, Krause N, Measurement of psychosocial workplace exposure variables, Occup Med 2000;15(1):163-188 *(a copy of this book chapter will be posted on the class website)*. (3) Siegrist, TBD (effort-reward imbalance model and questionnaire) (4) Karasek, TBD (job strain model and job content questionnaire) ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (3) Greiner BA, Krause N, Observational stress factors and musculoskeletal disorders in urban transit operators, Journal of Occupational Health Psychology 2006;11:38-51 (4) Rugulies R, Krause N, Job strain, isostrain, and incidence of back and neck injury: a 7.5 year prospective study of San Francisco transit operators, Social Science and Medicine 2005;61(1):27-39 (5) Greiner BA, Krause N, Ragland DR, Fisher JM, Occupational Stressors and Hypertension: a multi-method study using observer-based

	job analysis and self-reports in urban transit operators. Soc Sci and Med 2004:59;1081-1094 (6) Krause N, Burgel B, Rempel D, Effort-Reward-Imbalance and One-Year Change in Neck/Shoulder and Upper Extremity Pain among Call Center Computer Operators, Scand J Work Environ Health 2010;36(1):42-53 **Student Presentations (max 2): TBD**
Week 7 Feb 20 Ritz	**Special Strategies and Methods of Data Analysis I: Validity: Assessment of confounding, selection bias, healthy worker effect** *Required readings:* ***(1) Checkoway textbook***: Chapter 4 pages 83-112: Precision and validity in study design (2) Arrighi, H Michael; Hertz-Picciotto, Irva. The Evolving Concept for the Healthy Worker Survivor Effect. Epidemiology, 1994 Mar, 5(2):189-196. (3) Richardson DB, Laurier D, Schubauer-Berigan MK, Tchetgen ET, Cole SR. Assessment and Indirect Adjustment for Confounding by Smoking in Cohort Studies Using Relative Hazards Models. Am J Epidemiol. 2014 Sep 21 ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (4) Ashley I. Naimi, Stephen R. Cole, Michael G. Hudgens, M. Alan Brookhart, David B. Richardson. Assessing the component associations of the healthy worker survivor bias: occupational asbestos exposure and lung cancer mortality. Annals of Epidemiology 23 (2013) 334e341 (5) Arrighi HM, Hertz-Picciotto I, Controlling the healthy worker survivor effect: an example of arsenic exposure and respiratory cancer. Occupational and Environmental Medicine 1996;53:455-462 (6) Nyberg et al. Job strain as a risk factor for type 2 diabetes: a pooled analysis of 124,808 men and women. Diabetes Care. 2014 Aug;37(8):2268-75
Week 8 Feb 27 Krause	**Special Research Strategies and Methods for Special Vulnerable Worker Populations: Application: Community-based participatory research with low wage female immigrant workers** ***Required readings:*** (1) *Levi textbook* Chapter 36: Addressing health and safety hazards- in specific industries: agriculture, construction, and health care (2) Lee PT, Krause N, Goetchius C, Agiesti JM, Participatory action research with hotel room cleaners in San Francisco and Las Vegas: from collaborative study to the bargaining table. In: Minkler M, Wallerstein N, eds. Community based participatory research for health: from process to outcomes. Jossey-Bass, New York 2008 ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (3) Krause N, Rugulies R, Maslach C, Effort-reward imbalance at work and health status among Las Vegas hotel room cleaners. Am J Ind Med 2010;53(4):372-86 (4) Krause N, Scherzer T, Rugulies R, Physical workload, workload intensification, and prevalence of pain in low wage workers: results from a participatory research project with hotel room cleaners in Las Vegas, Am J Ind Med 2005;48:326-337 (5) Rugulies R, Scherzer, T, Krause N, Associations between Psychological Demands, Decision Latitude and Job Strain with Smoking in

	Female Hotel Room Cleaners in Las Vegas, Int J Behav Med 2008;15(1):34-43 6) Minkler M, Salvatore AL, Chang C, Gaydos M, Liu SS, Lee PT, Tom A, Bhatia R, Krause N, Wage theft as a neglected public health problem: An overview and case study from San Francisco's Chinatown district, AJPH, 2014; published online ahead of print April 17, 2014:e1-e11. Doi:10.2105/AJPH.2013.301813 **Student Presentations (max 2): TBD**

Week 9 **Mar 6** **Ritz**	**Special Strategies and Methods of Data Analysis II:** **Stratified analyses; standardized mortality ratios; matched analysis** ***Required readings:*** (1) *Checkoway textbook*: Chapter 5 pages 136-172: Methods of data analyses *(2) Checkoway textbook*: Chapter 9 pages 263-280: Advanced statistical analysis (3) Alavanja, M. C., Sandler, D. P., McMaster, S. B., Zahm, S. H., McDonnell, C. J., Lynch, C. F., Pennybacker, M., Rothman, N., Dosemeci, M., Bond, A. E., Blair, A. (1996). The Agricultural Health Study. Environ Health Perspect, 104(4), 362-369. ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (5) Blair, Aaron; Stewart, Patricia A; Hoover, Robert N. Mortality From Lung Cancer Among Workers Employed in Formaldehyde Industries. *American Journal of Industrial Medicine*, 1990, **17**:683-699. (6) Alavanja MCR, Samanic C, Dosimeci M, Lubin J, Tarone R, Lynch CF, Knott C, Thomas K, Hoppin JA, Barker J, Coble J, Sandler DP, Blair A. (2003). Use of agricultural pesticides and prostate cancer risk in the Agricultural Health Study cohort. American Journal of Epidemiology, 157(9), 800-814. (7) Seidler A1, Harth V, Taeger D, Möhner M, Gawrych K, Bergmann A, Haerting J, Kahmann HJ, Bolt HM, Straif K, Brüning T. Dinitrotoluene exposure in the copper mining industry and renal cancer: a case-cohort study. Occup Environ Med. 2014 Apr;71(4):259-65. **Student Presentations (max 2): TBD**
Week 10 **March 13** **Krause**	**Topic: TBD (Special Strategies and Methods of Data Analysis III:)** **Application: TBD** ***Required Reading:*** (1) *Checkoway textbook:* Chapter 9 pages 280-293: Model specification (2) *TBD* ***SELECT AND READ ONE of the following original papers AND SUBMIT BY E-MAIL ONE QUESTION you would like to get answered in class! (Reading list may change – double check before class!)*** (1) TBD

	Student Presentations (max 5) **Note: FINAL take home exam part II to be handed out in this class.**
Week 11	**(No class)** **DUE: Final Take Home Exam Part 1: Mar 17, Part II: Mar 20, per e-mail to both Drs Krause and Ritz.**

Guidelines for Assignments in Occupational Epidemiology (EPIDEM 261, ENV HLT M260) Spring 2019:

A. Homework Assignments

a) Homework assignments are due per e-mail to both course directors 48 hours before class begins
b) Students are expected to keep a log of their questions, answers, and strategies and results of further inquiry

B. Guidelines for Student Presentations:

1) Selection of paper for presentation:

a) All original studies listed in the syllabus are eligible for presentation.
b) Selection of papers and presentation date require approval by course director
c) **Slots for presentations (2 per class) are assigned on a first-come-first-serve basis.**
d) Power-point file of presentation is due via e-mail to both instructors by Sunday before class.

2) Outline for paper presentation:

a) Background / literature review / research gap / significance of the problem (1 slide)
b) Research question, study aims, or study hypothesis (1 slide)
c) Methods: study design, population, data sources, assessment of exposure and outcome, analysis plan (1-3 slides)
d) Results and conclusions (1-2 slides)
e) Evaluation: Discuss design, sources of bias (selection, information, confounding), strengths and weaknesses, recommendations for improvement. (1-2 slides)
f) Formulate 1 question that interests you but that you cannot answer yourself plus prepare 2 questions or topics for class discussion. (1 slide)
g) Format of presentation: 6-10 power point slides, 6-10 minutes presentation time, preparation of 1 own question and 1-2 discussion topics for class, 5-10 min class discussion. Use clear organization (titles, layout), graphical summaries of data or concepts (with self-explanatory labels), and ensure readability (at least font size18 or 24).
h) Practice presentation at home to test if you meet the time limit.
i) Presentations will be evaluated by content, oral presentation, and visual presentation.

C. Final Take-Home Exam

Part I: Prepare a log of your homework questions throughout the course together with answers you found and strategies you used for clarification. **AN EDITED LOG OF YOUR QUESTIONS AND ANSWERS (PART I of FINAL TAKE HOME EXAM) IS DUE BY MARCH 17 per e-mail to both course directors.**

Part II: A journal article will be assigned together with questions about it. Answering these questions in writing is part II of the final exam. Part II will be given in class on March 13 (week 10). **FINAL TAKE-HOME II EXAM IS DUE BY MARCH 20 (week 11, finals week, no class) per e-mail to both course instructors**.

Interesting Web pages to browse: (TBD - to be updated)

http://www.globalmarch.org/
http://www.osha.gov/oshstats/
http://www.bls.gov/

Photography
ILO press photography collection (can be downloaded for free, for appropriate use)
http://www.ilo.org/pubcgi/235photo.pl?keywords=child+labour
Child Labor in Towns and Cities, photo essays in Changemakers.net, April, 2000
http://www.changemakers.net/studio/00april/jarman2.cfm

Stolen Dreams, book by photographer Dr. David Parker
http://www.hsph.harvard.edu/gallery
Images of children working in Madras, India, photography by Usha Kris
http://www.childlabor.org/usha.jpg
America from the Great Depression to World War II
Photography of the Farm Security Administration-Office of War Information Collection (Library of Congress)
http://memory.loc.gov/ammem/fsahtml/fahome.html
Historical Photographs of child labor in the United States, early 1900s, by Lewis Hine
http://lcweb.loc.gov/rr/print/coll/207-b.html
How The Other Half Lives, by Jacob Riis, about living conditions (including child labor) in New York City in 1890
http://www.cis.yale.edu/amstud/inforev/riis/title.html

Health and Safety News at the European Trade Union Institute
http://hesa.etui-rehs.org/uk/newsevents/news.asp

Supplemental Readings (TBD – to be updated)

1. Tarlo, Susan M. **Workplace respiratory irritants and asthma**. *Occupational Medicine: State of the Art Reviews*, 2000, **15**(2): 471-483
2. Tarlo, Susan M.; Liss, Gary; Corey, Paul; Broder, Irvin. **A worker's compensation claim and population for occupational asthma**. Comparison of subgroups. *Chest*, 1995, **107**(3): 634-641
3. Balmes, John; Rempel, David; Alexander, Mark; Reiter, Randy; Harrison, Robert; Bernard, Bruce; Benner, Douglas; Cone, James. **Hospital records as a data source for occupational disease surveillance: A feasibility study.** *American Journal of Industrial Medicine*, 1992, **21**: 341-351
4. Wagener, Diane K.; Buffler, Patricia A. **Geographic distribution of deaths due to sentinel health event (occupational) causes.** *American Journal of Industrial Medicine*, 1989, **16**: 355-372
5. Benke, Geza; Sim, Malcolm; Forbes, Andrew; Salzberg, Michael. **Retrospective assessment of occupational exposure to chemicals in community-based studies: Validity and repeatability of industrial hygiene panel ratings**. *International Journal of Epidemiology*, 1997, 26(3): 635-642.
6. Steenland, Kyle; Deddens, James A. **Increased precision using countermatching in nested case-control studies**. *Epidemiology*, 1997, **8**(3): 238-242
7. Salvan, Alberto; Leslie, Stayner; Steenland, Kyle; Smith, Randall. **Selecting an exposure lag period**. *Epidemiology*, 1995, **6**(4): 387-390
8. Reviere, Rebecca; Schneider, Scott; Woolbright, Kathy. **Associations between disease and occupation: Hypotheses generated from the national mortality follow back survey**. *American Journal of Industrial Medicine*, 1995, **27**: 195-205
9. Dosemeci, Mustafa; Cocco, Pierluigi; Gómez, Manuel; Stewart, Patricia A.; Heineman, Ellen F. **Effects of three features of a job-exposure matrix on risk estimates**. *Epidemiology*, 1994, 5(1): 124-127.
10. **Retrospective Evaluation of Occupational Exposures in Epidemiology: A European Concerted Action 1990-1992**. International Journal of Epidemiology, 1993, 22 (Supplement 2).
11. Holtermann A, Burr H, Hansen JV, Krause N, Søgaard K, Mortensen OS, **Occupational physical activity and mortality among Danish workers**, Int Arch Occup Environ Health, 2012; 85(3):305-10
12. Lee SJ, Faucett J, Gillen M, Krause N, **Musculoskeletal pain among critical care nurses by availability and use of patient lifting equipment: an analysis of cross-sectional survey data**, Int J Nurs Stud (2013), http://dx.doi.org/10.1016/j.jnurstu.2013.03.10
13. **Krause N**, Physical activity and cardiovascular mortality – disentangling the roles of work, fitness, and leisure, Scand J Work Environ 2010; 36(5):349-55
http://www.sjweh.fi/show_abstract.php?abstract_id=3077