**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:**


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)

<table>
<thead>
<tr>
<th>Course Objectives</th>
<th>Specific (Occupational) Epidemiology Competencies: ASPH Core MPH Competencies</th>
<th>ASPH Core MPH Competencies</th>
</tr>
</thead>
</table>
| 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)*:

<table>
<thead>
<tr>
<th>Week 1</th>
<th>History of Occupational Health and Global Burden of Occupational Disease and Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 9</td>
<td><strong>Krause</strong></td>
</tr>
<tr>
<td><strong>Required readings (copies are posted on the course website for download):</strong></td>
<td></td>
</tr>
<tr>
<td>(1) Checkoway textbook: Chapter 1 pages 3-16: Introduction</td>
<td></td>
</tr>
<tr>
<td>(2) Levi textbook: Chapter 1 pages 3-22: Occupational and Environmental Health: Twenty-First Century Challenges and Opportunities</td>
<td></td>
</tr>
<tr>
<td><strong>SELECT AND READ ONE of the following original papers:</strong></td>
<td></td>
</tr>
<tr>
<td>(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</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 2</th>
<th>Study Design Issues in Occupational Epidemiology: Occupational Cohort and (Nested) Case Control Studies</th>
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</thead>
<tbody>
<tr>
<td>Jan 16</td>
<td><strong>Ritz</strong></td>
</tr>
<tr>
<td><strong>Required readings:</strong></td>
<td></td>
</tr>
<tr>
<td>(1) Checkoway textbook: Chapter 3 pages 59-81: Overview of study designs</td>
<td></td>
</tr>
<tr>
<td>(2) Checkoway textbook: Chapter 5 pages 123-140: Cohort studies</td>
<td></td>
</tr>
<tr>
<td>(3) Checkoway textbook: Chapter 6 pages 179-200: Case-control studies</td>
<td></td>
</tr>
<tr>
<td><strong>Supplemental Readings:</strong></td>
<td></td>
</tr>
<tr>
<td>(6) Levi textbook: Chapter 17: pages 366-397: Cancer</td>
<td></td>
</tr>
<tr>
<td>(7) Levi textbook: Chapter 12C: pages 258-280: Ionizing and non-ionizing radiation</td>
<td></td>
</tr>
<tr>
<td><strong>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!):</strong></td>
<td></td>
</tr>
</tbody>
</table>
### 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  

**Supplemental 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 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:**  
2. *Levi textbook*: Chapter 23 pages 492-504: Cardiovascular disorders  

**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*


Student Presentations (max 2): TBD

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**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

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**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
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!)*


(5) Greiner BA, Krause N, Ragland DR, Fisher JM, Occupational Stressors and Hypertension: a multi-method study using observer-based
<table>
<thead>
<tr>
<th>Week 7</th>
<th>Feb 20</th>
<th>Special Strategies and Methods of Data Analysis I: Validity: Assessment of confounding, selection bias, healthy worker effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ritz</td>
<td></td>
<td><strong>Required readings:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1) <strong>Checkoway textbook</strong>: Chapter 4 pages 83-112: Precision and validity in study design</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>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!)</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Week 8</th>
<th>Feb 27</th>
<th>Special Research Strategies and Methods for Special Vulnerable Worker Populations: Application: Community-based participatory research with low wage female immigrant workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krause</td>
<td></td>
<td><strong>Required readings:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1) <strong>Levi textbook</strong> Chapter 36: Addressing health and safety hazards- in specific industries: agriculture, construction, and health care</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>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!)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5) Rugulies R, Scherzer, T, Krause N, Associations between Psychological Demands, Decision Latitude and Job Strain with Smoking in</td>
</tr>
</tbody>
</table>

Student Presentations (max 2): TBD

<table>
<thead>
<tr>
<th>Week 9</th>
<th>Special Strategies and Methods of Data Analysis II:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 6</td>
<td>Stratified analyses; standardized mortality ratios; matched analysis</td>
</tr>
</tbody>
</table>

**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

**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

<table>
<thead>
<tr>
<th>Week 10</th>
<th>Topic: TBD (Special Strategies and Methods of Data Analysis III:)</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 13</td>
<td>Application: TBD</td>
</tr>
</tbody>
</table>

**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
<table>
<thead>
<tr>
<th>Students Presentations (max 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note: FINAL take home exam part II to be handed out in this class.</td>
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</table>

<table>
<thead>
<tr>
<th>Week 11 (No class)</th>
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<tbody>
<tr>
<td>DUE: Final Take Home Exam Part 1: Mar 17, Part II: Mar 20, per e-mail to both Drs Krause and Ritz.</td>
</tr>
</tbody>
</table>
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)
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)
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