I. Course Description

Practice, practice, practice: The skilled application of epidemiologic methods requires diligence and repetition to ensure that the appropriate range of uncertainty about causality is generated by studies of human health. Methods of analysis and inference stemming from fundamental validity concepts provide tools to quantify the level of uncertainty quantitatively about estimated parameters and their appropriate application can be tricky. Recent publications have thrown suspicion on exposure to swine farming operations as a cause of asthma (Merchant et al., 2005; Mirabelli et al., 2006). This semester, after an introduction to the history and fundamentals of case-control study designs, the seminar will focus on risk factors for asthma, including proximity to agricultural operations, in order to provide practice in causal inference by reading and analyzing publications on those topics, and then applying validity tools such as sensitivity analysis and uncertainty analysis to the results of the relevant studies. Discussion of methodological and applied readings from the literature will be combined with hands-on application of validity assessment.

II. Learning Objectives
1. Recognize the how case-control study designs relate to the general paradigm for study design under the counterfactual model to identify potential sources of bias from specific study designs.
2. Examine the literature regarding environmental causes of asthma, especially agricultural sources, and evaluate the strength of the evidence.
3. Become proficient at using tools of bias evaluation and uncertainty analysis to quantify potential biases and adjust results when appropriate.

III. Methods of Instruction and Work Expectations

Class time will be spent leading or participating in critically discussing papers on methods and specific studies using those methods; applying tools such as bias assessment, uncertainty analysis, and meta-analysis to better understand applied papers or data sets; and designing studies or parts of studies related to environmental and occupational health in order to minimize bias. Students will be required to develop models or analyses as homework assignments, participate in class discussions, and to lead at least two discussions during the semester. Assignments will include reading, preparing examples or analyses, and leading discussions on a topic. Grade is dependent upon participation in all aspects of the seminar.

IV. Grading

1. Grading Criteria – S/N

2. Grading Option (if applicable) – Students may change grading options during the initial registration period or during the first two weeks of the term. **The grading option may not be changed after the second week of the term.**

3. Course Incomplete – An incomplete grade is permitted only in cases of exceptional circumstances and following consultation with the instructor. In such cases an “I” grade will require a specific written agreement between the instructor and the student specifying the time and manner in which the student will complete the course requirements. Extension for completion of the work will not exceed one year.

4. Scholastic Dishonesty – “Students are responsible for knowing the University of Minnesota Board of Regents' policy on student conduct and scholastic dishonesty: [http://www.umn.edu/regents/policies/academic/StudentConduct.html](http://www.umn.edu/regents/policies/academic/StudentConduct.html). Scholastic dishonesty as defined in the policy and will be reported to the Office of Student Judicial Affairs: [http://www.sja.umn.edu/](http://www.sja.umn.edu/) and will result in a grade of "F" or "N" for the entire course.

Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas as your own. Serious, intentional plagiarism will result in a grade of "F" or "N" for the entire course. For more information on this policy and for a helpful discussion of preventing plagiarism, please consult University policies and procedures regarding academic integrity: [http://cisw.cla.umn.edu/plagiarism/uofmpolicies.html](http://cisw.cla.umn.edu/plagiarism/uofmpolicies.html).

Students are urged to be careful that they properly attribute and cite others' work in their own writing. For guidelines for correctly citing sources, go to [http://tutorial.lib.umn.edu/](http://tutorial.lib.umn.edu/) and click on “Citing Sources”.
In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course for which you receive credit in another course unless by prior agreement with the instructor. Building on a line of work begun in another course or leading to a thesis, dissertation, or final project is acceptable.
If you have any questions, consult the instructor.”

V. Course Withdrawal

School of Public Health students may withdraw from a course through the second week of the semester without permission. No “W” will appear on the transcript. After the second week students are required to do the following:

• The student must contact and notify their advisor and course instructor informing them of the decision to withdraw from the course.
• The student must send an e-mail to the SPH Student Services Center (SSC). The email must provide the student name, ID#, course number, section number, semester and year with instructions to withdraw the student from the course, and acknowledgement that the instructor and advisor have been contacted.
• The advisor and instructor must email the SSC acknowledging the student is canceling the course. All parties must be notified of the student’s intent.
• The SSC will complete the process by withdrawing the student from the course after receiving all emails (student, advisor, and instructor). A “W” will be placed and remain on the student transcript for the course.
• After discussion with their advisor and notification to the instructor, students may withdraw up until the eighth week of the semester. There is no appeal process.

VI. Course Text and Readings

Methodological papers: Robins et al.


VII. Course Outline/Weekly Schedule

Week 1: Introduction to the course, grading, expectations, definitions, philosophical background, concepts of causal inference, validity, counterfactuals, and causal models. Homework: read Maldonado & prepare to discuss.

Weeks 2-5: Introduction to reproductive health outcomes. Environmental factors that may affect reproduction. Reading of selected papers. Modeling & discussion

Weeks 6-9: Introduction to diacetyl and bronchitis. Scientific and legal background. Reading of selected research. Modeling and discussion
Weeks 11-14: Introduction to randomized trials of screening methods. History of trials and results of key trials. Reading of selected papers. Modeling and discussion.

Week 15: Presentation of final results.

Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and Disability Services at the beginning of the semester. All discussions will remain confidential. For further information contact the University of Minnesota Disability Services website at <http://ds.umn.edu/> or call 612/626-1333 (V/TTY).