

CANCER EPIDEMIOLOGY AND PATHOGENESIS (EPID 770)

SPRING 2016, T/Th 9:30-10:45

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Course objective: The objective of this course is to provide a framework for understanding and critically evaluating epidemiologic literature. The course will cover cancer statistics, major risk factors for cancer, mechanisms of carcinogenesis, biomarkers in cancer research, and current controversies in cancer research. Students will gain background knowledge of cancer biology and epidemiology needed to interpret and critique cancer prevention research and will develop and practice skills in critiquing literature, resolving discrepancies between studies, and identifying knowledge gaps.

Readings: Assigned readings and study questions will be provided through Sakai. There is no assigned textbook for the course, but these texts may be useful as references:

Nasca and Pastides. Fundamentals of Cancer Epidemiology (2nd Ed). Jones and Bartlett, Sudbury, MA 2008.

Schottenfeld and Fraumeni. Cancer Epidemiology and Prevention, (3rd Ed). Oxford, New York, NY 2006.

Course requirements:

Class participation (20%): Each class period will include a discussion of assigned readings and study questions. Students are required to complete reading and/or homework assignments prior to class. Several class sessions are set up as student-led discussion. Peer evaluation sheets will be collected for panel discussants, and both the evaluator and the discussant will receive a grade based on these evaluations.

Literature critique (20% X 2): Two peer-review critiques will be written during the semester on assigned articles. The articles will be taken from the current literature and the written critique should resemble a critique that would be written as a reviewer for a scientific journal. The review should begin with a summary of the purpose/scientific objective of the article and proceed to discuss strengths as well as areas for improvement. It is often helpful to divide the review into major and minor criticisms. Where appropriate, page, paragraph, and line numbers should be indicated for each major and minor point made in the critique. Students wishing to receive feedback on their first critique may submit the critique two weeks prior to the due date.

Homework (5% X 3): Three homework assignments will be assigned. The homework will be graded as P/F, but will be required to be turned in during class. In class discussion of the homework will be used to help students assess their work and discussion will contribute to the class participation grade.

Final presentation (25%): A final project will be presented in the final days of class. This project will require a critical literature review related to a specific research question and hypothesis in cancer epidemiology, integrating biologic and epidemiologic literature to identify gaps and conflicts. Students should submit a one page summary of their intended project topic by March 3.

Late policy: Late literature critiques will lose 25 points per day. After four days, late assignments will not be accepted. Late homework will receive no credit. Final presentation will be set for a scheduled date and will not be rescheduled except in case of illness. If students miss their final presentation, they will receive an incomplete grade for the course.

Honor code: According to the University honor code (<https://studentconduct.unc.edu>), "The University of North Carolina at Chapel Hill has had a student-led honor system for over 100 years. Academic integrity is at the heart of Carolina and we all are responsible for upholding the ideals of honor and integrity. The student-led Honor System is responsible for adjudicating any suspected violations of the Honor Code and all suspected instances of academic dishonesty will be reported to the honor system. Information, including your responsibilities as a student is outlined in the Instrument of Student Judicial Governance. Your full participation and observance of

the Honor Code is expected. Quote and cite any words that are not your own. If you paraphrase the words of another, you must still give proper attribution.”

Disability services: Per, the UNC Accessibility Resources and Services (ARS) Office (919-962-8300; accessibility@unc.edu), “The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities. All accommodations are coordinated through the Accessibility Resources and Service Office.” Detailed information about ARS and the registration process is available at accessibility.unc.edu. Additional information about ARS is available at <https://accessibility.unc.edu>.

Date	Topic/Speaker	Assignments/Readings
Cancer Surveillance and Statistics		
Jan 12	Cancer Statistics: Overview	<p>Bailar JC and Gornik HL. (1997) Cancer Undefeated. <i>New England Journal of Medicine</i>, 336: 1569 – 1574.</p> <p>Ryerson, A. B., Ehemann, C. R., Altekruse, S. F., Ward, J. W., Jemal, A., Sherman, R. L., Henley, S. J., Holtzman, D., Lake, A., Noone, A.-M., Anderson, R. N., Ma, J., Ly, K. N., Cronin, K. A., Penberthy, L. and Kohler, B. A. (2016) Annual Report to the Nation on the Status of Cancer, 1975-2012, featuring the increasing incidence of liver cancer. <i>Cancer</i>, 122: 1312-1337.</p>
Jan 17	Cancer Screening (Nichols)	<p>Weiss NS (2003) Adjusting for Screening History in Epidemiologic Studies of Cancer: Why, When and How to Do it. <i>Am J Epidemiology</i> 157: 957-961.</p> <p>Welch HG, Prorok PC, O'Malley J, Kramer BS. (2016) Breast-Cancer Tumor Size, Overdiagnosis and Mammography Screening Effectiveness. <i>NEJM</i>, 375: 1438-47.</p>
Jan 19	Cancer Statistics: Incidence	<p>Smith BD et al. (2009) Future of Cancer Incidence in the United States: Burdens Upon an Aging Changing Nation. <i>J Clin Oncol</i>. 27: 2758-2765.</p> <p>Clegg LX et al. (2002) Impact of Reporting Delay and Reporting Error on Cancer Incidence Rates and Trends. <i>Journal of the National Cancer Institute</i>. 94: 1537-45.</p>
Jan 24	Cancer Statistics: Global Patterns	<p>Global Burden of Disease Cancer Collaboration (2016). Global burden of cancer. <i>JAMA Oncology</i>, 1(4):505-527.</p> <p>Ginsburg et al. (2016) The global burden of women's cancers: a grand challenge for public health. <i>Lancet</i>, epub. Nov 1.</p>
Jan 26	Cancer Statistics: Mortality and Survival	<p>Literature Critique 1 Due</p> <p>Albano et al. (2007) Cancer Mortality in the United States by Education Level and Race. <i>Journal of the National Cancer Institute</i>, 99: 1384-1394.</p> <p>Wingo et al. (1998) Long-Term Cancer Patient Survival in the United States. <i>Cancer Epidemiology, Biomarkers & Prevention</i>. 7: 271-282.</p> <p>Janssen-Heijnen et al. (2007) Prognosis for long-term survivors of cancer. <i>Annals Oncology</i> 18: 1408-1413.</p>
Theories and Classification in Carcinogenesis		
Jan 31	Multistage models/Theories of Carcinogenesis	<p>Day N, Brown C. Multistage models and Primary Prevention of Cancer. <i>J Natl Cancer Inst</i> 64: 977-89 (1980).</p> <p>Hanahan and Weinberg (2000) The hallmarks of cancer. <i>Cell</i> 100:57-70.</p> <p>Vineis P, Schatzkin A, and Potter JD. (2010) Models of carcinogenesis: An overview. <i>Carcinogenesis</i> 31:1703-1709</p>
Feb 2	Histopathology (Sherman)	Sherman et al. (2010) Molecular pathology in epidemiologic studies: A primer on key considerations. <i>Cancer Epidemiology Biomarkers Prevention</i> ; 19:966-972

		http://www.cancer.gov/cancertopics/factsheet/detection/staging http://www.cancer.gov/cancertopics/factsheet/detection/tumor-grade
Feb 7	Classification of Cancers (student led)	Assignment 1 Due Student volunteers needed to lead discussion
Feb 9	Induction and Latency	Rothman K. (1981) Induction and latent periods. Am J Epidemiol 114: 253-259.
Feb 14	Induction and Latency (student led)	Giovannucci E. (2001) An updated review of the epidemiological evidence that cigarette smoking increases risk of colorectal cancer. Cancer Epidemiol Biomark Prev 10: 725-731.
Risk Factors for Cancer		
Feb 16	Genetics/Family History (student led)	Assignment 2 Due Student volunteers needed to lead discussion Khoury and Flanders (1995) Bias in using family history as a risk factor in case-control studies of disease. 6:511-519. Murff et al. (2002) Does this patient have a family history of cancer? JAMA 292(12): 1480-1489.
Feb 21	Infectious disease/HPV (Smith)	Plotkin, Stanley A, Orenstein, Walter A, Offit, Paul A. Vaccines: Human Papillomavirus Vaccine. Elsevier Saunders. 2012. Pages 235-256. Herrero R, González P, Markowitz LE. Present status of human papillomavirus vaccine development and implementation. Lancet Oncol. 2015 May;16(5):e206-16.doi: 10.1016/S1470-2045(14)70481-4. Review. PubMed PMID: 25943065.
Feb 23	Obesity (Allott)	Calle EE and Kaaks (2004) Overweight, obesity and cancer: epidemiological evidence and proposed mechanisms. Nature Reviews Cancer (4):570-591.
Feb 28	Pharmacoepidemiology (Lund)	TBD
Mar 2	Alcohol and Smoking (Williams)	Submit one page summary of proposed final project Allen NE, Beral V, Casabonne D et al. (2009) Moderate alcohol intake and cancer incidence in women. J Natl Cancer Institute, 101: 296-305. Bagnardi V, Randi G, Lubin J et al. (2010) Alcohol consumption and lung cancer risk in the environment and genetics in lung cancer etiology (EAGLE) study. Am J Epidemiol 171:36-44.
Mar 7	Hormones (Sherman)	TBD
Mar 9	Hormones (Sherman)	TBD
Biomarkers and Surrogate Endpoints		
Mar 21	Diet: Observation vs. Experiment	Martinez ME, Marshall JR, Giovannucci E. (2008) Diet and cancer prevention: the roles of observation and experimentation. Nature reviews cancer. 8: 694-703.
Mar 23	Observation vs. Experiment (student led)	Assignment 3 due Student volunteers needed to lead discussion Selenium and bladder cancer written assignment.
Mar 28	Chemoprevention (Baron)	TBD
Mar 30	Biomarkers	Schatzkin A and Gail M. (2002) The promise and peril of surrogate endpoints in cancer research. Nature Reviews Cancer. 2:1-9.

		Vineis and Perera (2007) Molecular epidemiology and biomarkers in etiologic cancer research: the new in light of the old. <i>Cancer Epidemiol Biomarkers Prev</i> 16: 1954-1965.
Apr 4	Biomarkers II (Engel)	TBD
Integration of Course Concepts		
Apr 6	Late Breaker Topic (or makeup day)	TBD
Apr 11	Resolving conflicting studies (groups)	Literature Critique 2 Due
Apr 18	Resolving conflicting studies (debate)	
Apr 20	Final projects	
Apr 25	Final projects	
Apr 27	Final projects	

PEER REVIEW FORM

Facilitator(s): _____

Reviewer: _____

Points	Criterion
/15	Clarity of Purpose: Did the discussant(s) state their objectives clearly and objectively??
/15	Organization: Was the discussion/presentation organized? Did the discussant use handouts or other tools to effectively structure the discussion?
/50	Content: Was the assignment/reading thoroughly discussed? Were major points covered? If key points were missing, what were they and why were they important to discuss?
/20	Style: Was the discussion well-paced? Were the discussants respectful and courteous? Did the discussants draw out a variety of perspectives? Did the discussants keep the discussion moving

Please Comment on each domain, providing specific feedback and suggestions for improvement:

Criterion	Comment
Clarity	
Organization	
Content	
Style	