

INTRODUCTION TO NUTRITIONAL EPIDEMIOLOGY
Nutritional Sciences/Population Health 621
Spring 2018

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Dates and Location: Wednesday and Friday 11 AM- 12:10, January 30, 2018 to March 23, 2018: WARF Building, Room 511

Course objectives:

NS 621, 1 credit: This course is designed for graduate students in Nutritional Sciences and Population Health. The purpose is to introduce students to conceptual frameworks and skills needed in order to understand how to evaluate relationships of nutritional states to health and chronic disease in large samples of people. There is a focus on interpreting findings of epidemiological studies and clinical trials in the scientific literature, and integrating them with other knowledge in nutritional research and epidemiological research. The purpose of this course is to 1) to provide students with the ability to understand and critically evaluate the nutritional epidemiology literature; 2) to provide students with basic knowledge to incorporate methods of assessing dietary and nutritional status of individuals into future studies. There is a focus on chronic disease epidemiology rather than acute nutritional deficiencies.

Prerequisites: A course in nutrition and a course in statistics; graduate student status or consent of instructor.

To enable students to:

1. Discuss the complexity of assessing the diets of free-living individuals and studying relationships to health:

- a. Apply knowledge about the contributions that nutritional epidemiology can make to understanding relationships between food and health, in relation to other approaches used in nutritional sciences.
 - b. Describe limitations of this method of acquiring knowledge and future directions that show promise for greater understanding.
2. Describe the study designs and statistical tools commonly used in the nutritional epidemiology literature to report the magnitude and statistical significance of relationships between diet and health or disease outcomes.
 3. Outline the strengths and weaknesses of assessing nutrition through biological markers, individual nutrients, supplement use and adherence to dietary patterns.
 4. Choose a dietary intake instrument appropriate to particular research designs and questions.
 5. Critically interpret the results of studies in the nutritional epidemiologic literature based on potential for bias, confounding and effect modification.
 6. Describe national and state surveys that monitor the nutritional status of the U.S. population.

Grading:

Completion of Diet Assessment Project 20%

Midterm Exam – Take Home 30%

Final Paper* 40%

Class Participation 10%

*Read and critique an assigned paper on nutritional exposures relating to a common chronic disease. Plan and discuss papers in groups. Present as part of a group in class. Prepare a five-page paper that describes and critiques the paper using skills learned in class. This will include critiques of 1) Study hypotheses and background which supports them, 2) Measurement of nutritional exposures, 3) Study design 4) Statistical approach 5) Results and interpretation 6) Conclusions and how these relate to the overall body of evidence using Bradford Hill criteria.

Diet Assessment Project- Complete, as a study participant, assessments of your diet two National Cancer Institute web-based tools: Diet History Questionnaire and automated Self-administered 24-hour Recall (ASA24) system. Complete: 1) a questionnaire about this experience, 2) a worksheet about these diet assessment resources after discussing class results in class.

Textbooks

REQUIRED:

Nutritional Epidemiology by Walter Willett (3rd edition, Oxford University Press, 2013). Available at University Bookstore.

Additional resources (on Reserve at Ebling library) are:

Intuitive Biostatistics by Harvey Motulsky (Oxford University Press, 1995)

Epidemiology. An Introduction. by Kenneth Rothman, (Oxford University Press, 2002)

Design Concepts in Nutritional Epidemiology by Barrie Margetts and Michale Nelson (2nd edition, Oxford University Press, 1997)

Epidemiology: Beyond the Basics by Moyses Szklo and Javier Nieto (2nd edition, Jones and Bartlett Publications, 2007)

Critical Appraisal or Epidemiologic Studies and Clinical Trials by Mark Elwood (2nd edition, Oxford University Press, 1998)

Nutritional health : Strategies for disease prevention, edited by Norman J. Temple, Ted Wilson, David R. Jacobs, (Humana Press, 2006)
Principles of Nutritional Assessment, Second Edition by Rosalind S. Gibson (Oxford University Press, 2005)

Nutritional Sciences 621/Population Health 904
Introduction to Nutritional Epidemiology and Applications
Syllabus

| SESSION | DATE | TOPICS |
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| Class 1: January 31 Instructor: Julie Mares | | <p>INTRODUCTION TO THE STUDY OF NUTRITIONAL EPIDEMIOLOGY-ROLE OF THIS SCIENCE IN EVALUATING DIET AND DISEASE RELATIONSHIPS; OVERVIEW OF ROLE OF DIET IN DISEASE CAUSATION.</p> <p>Required Reading Willett, Chapter One, pages 1-4. (Up to “Correlation Studies”) and 10-11 (Interpretation of Epidemiological Data” to “Interpretation of Null Associations”)</p> <p>OPTIONAL RECOMMENDED READING AND RESOURCES:</p> <p>Rothman, K. J. & Greenland, S. (2005) Causation and causal inference in epidemiology. <i>Am J Public Health</i> 95 Suppl 1: S144-150.</p> <p>Jacobs, DR. “<u>Challenges in Research in Nutritional Epidemiology.</u>” In: NJ Temple, T Wilson, and DR Jacobs Jr, eds. <i>Nutritional Health. Second Edition</i> (Temple, NJ, Wilson, T and Jacobs, DR, eds) Totowa, New Jersey: Humana Press, 2005.</p> <p>Margetts, B. <u>Impact of Nutritional Epidemiology</u> in <i>Nutritional Health, Second Edition</i> (Temple, NJ, Wilson, T and Jacobs, DR, eds)Totowa, New Jersey: Humana Press, 2005. Introduction (p 1-3).</p> <p><u>An Introduction to Epidemiology</u> Rothman, KJ, Oxford University Press, 2002; Chapter 2. What is Causation?</p> <p>Fedak KM, et al. (2015) Applying the Bradford Hill criteria in the 21st century: how data integration has changed causal inference in molecular epidemiology. <i>Emerg Themes Epidemiol.</i></p> <p>Examples of using Bradford Hill-based criteria for causal inference in evaluating a body of evidence supporting relationships of nutrition to chronic disease: <u>Vitamin E and Heart Disease:</u> Kushi, LH <i>Am J Clin Nutr</i> 1999; 69 (suppl): 1322-9S. <u>Lutein and Cataract:</u> Mares-Perlman, JA <i>Am J Clin Nutr</i> 1999; 341-2. Musch DC. 2014. Evidence for including lutein and zeaxanthin in oral supplements for age-related macular degeneration. <i>JAMA Ophthalmol</i> 132:139-41.</p> <p>This series not only addresses causal criteria but also issues of strength of association (class 3) and confounding and effect modification (class 4):</p> <p>Shapiro, S. (2008) Causation, bias and confounding: a hitchhiker's guide to the epidemiological galaxy. Part 1. Principles of causality in epidemiological research: time order, specification of the study base and specificity. <i>J Fam Plan Reprod Health Care</i> 24: 83-87.</p> <p>Shapiro, S (2008) Causation, bias and confounding: a hitchhiker's guide to the epidemiological galaxy Part 2. Principles of causality in epidemiological research: confounding, effect modification and strength of association. <i>J Fam Plan Reprod Health Care</i> 34: 185-189.</p> <p>Shapiro, S (2008) Causation, bias and confounding: a hitchhiker's guide to the epidemiological galaxy. Part 3: principles of causality in epidemiological research: statistical stability, dose- and duration-response effects, internal and external consistency, analogy and biological plausibility. <i>J Fam Plan Reprod Health Care</i> 34: 261-264.</p> |
| Class 2: February 2 Instructor: Julie Mares | | <p>RESEARCH DESIGNS: OBSERVATIONAL EPIDEMIOLOGY AND CLINICAL TRIALS</p> <p><u>Examples of Major Observational Studies:</u> Women’s Health Initiative Harvard Nurse’s Health Study and Male Health Professional Studies Atherosclerosis Risk in Communities Study Swedish Mammography Cohort</p> |

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| | <p><u>Examples of Major Clinical Trials:</u> Women’s Health Initiative Women’s Health Study Physician Health Study</p> <p>REQUIRED READING: Willett Chapter One, page 4 “Correlation Studies” to and page 10 Chapter 16, p 357-362, up to “Types of Nutritional Policies.”</p> <p>ADDITIONAL OPTIONAL RESOURCES: Steck, SE, Epidemiologic Approaches to Evaluation of Nutrition and Health, In Present Knowledge in Nutrition, Tenth Edition edited by John, W. Erdman, Ian A. MacDonald and Steven H. Zeisel (International Life Science Institute, 2012)</p> <p>Margetts, B, Impact of Nutritional Epidemiology in Nutritional Health, Second Edition (Temple, NJ, Wilson, T and Jacobs, DR, eds) Totowa, New Jersey: Humana Press, 2005. Section 10-19 (pp 14-19).</p> <p>Freudenheim JL. Study design and hypothesis testing: issues in the evaluation of evidence from research in nutritional epidemiology. Am J Clin Nutr 1999;69(suppl): 1315S-1321S.</p> <p>Good discussion of study designs: <u>Epidemiology:” Beyond the Basics</u> by Moyses Szklo and Javier.Nieto (2nd edition, Jones and Bartlett Publications, 2007) pp3-42</p> |
| <p>Class 3: February 7 Instructor: Krista Christensen</p> | <p>HOW STRONG IS DIET’S INFLUENCE ON DISEASE?: STATISTICAL TOOLS USED TO DESCRIBE AND INTERPRET EPIDEMIOLOGIC DATA</p> <p>REQUIRED READING: Willett chapter 1, page 10-13; chapter 13, page 327-328.</p> <p>Friss, RH and Sellers, TA. Epidemiology for Public Health Practice. New York:Oxford University Press, 1995: <i>Evaluating Epidemiological Associations</i>. Odds ratios: p 212-216 Relative risk: p 223-224 Statistical Measures of Effect and Evaluating Epidemiological Associations p271-277.</p> <p>.</p> <p>ADDITIONAL OPTIONAL RESOURCES: Motulsky, H. Intuitive Biostatistics:New York: Oxford University Press, 1995. Chapter 8: Confidence Interval of the Difference or ratio of Two Proportions: Prospective Studies Chapter 9: Confidence Interval of the Difference or ratio of Two Proportions: Case-Control Studies Chapter 10: What is a P-value? Chapter 18: Introduction to Regression Chapter 19: Linear Regression Chapter 31 Multiple Regression Chapter 32: Logistic Regression Chapter 33: Comparing Survival Curves Chapter 38: The Big Picture, p303-306.</p> <p>Peterson, HB and Kleinbaum, DG I. Interpreting the literature in obstetrics and gynecology. Key concepts in epidemiology and biostatistics. Obstet Gynecol 78:4, 1991, p. 710-717.</p> <p>Good discussion of measures of associations in epidemiology including odds ratios and relative risks: <u>Epidemiology:” Beyond the Basics</u> by Moyses Szklo and Javier.Nieto (2nd edition, Jones and Bartlett Publications, 2007) pp 47-103</p> |
| <p>Class 4: February 9 Instructor: Krista Christensen</p> | <p>LIFESTYLE AND OTHER CONFOUNDING FACTORS THAT MAY EXPLAIN OR ALTER RELATIONSHIPS OF DIET TO DISEASE AND HOW TO CONTROL FOR THEM; PHYSICAL ACTIVITY AND ENERGY ADJUSTMENT</p> |

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| | <p>REQUIRED READING: Ely, J. (1992) "Confounding bias and effect modification in epidemiological research" Family Medicine 24:222-225.</p> <p>Willett Chapter 1, page 10-13. Willett et al Adjustment for total energy intake in epidemiologic studies. AJCN 1997 65 (S)1220-8 Chapter 11 p260-265; Summary on p 283. Willett: Chapter 13- p317-319 (Multivariate analysis)</p> <p>Skim to refresh : Rautiainen S, Lindblad BE, Morgenstern R, Wolk A. Total antioxidant capacity of the diet and risk of age-related cataract: a population-based prospective cohort of women. <i>JAMA Ophthalmol.</i> 2014;132(3):247-252</p> <p>ADDITIONAL OPTIONAL RESOURCES Willett Chapter 10 Assessment of Physical Activity Chapter 11 Implications of Total Energy Intake for Epidemiological Analyses Chapter 12 Correction for the Effects of Measurement Error</p> <p>For deeper understanding: Rothman, p. 101-110 (Confounding), p. 168-180 (Interaction/Effect Modification) Good discussion of confounding and bias: study designs: <u>Epidemiology: Beyond the Basics</u> by Moyses Szklo and Javier Nieto (2nd edition, Jones and Bartlett Publications, 2007) pp 107-181; Discussions of effect modification: pp183-203</p> <p>Shapiro, S (2008) Causation, bias and confounding: a hitchhiker's guide to the epidemiological galaxy Part 2. Principles of causality in epidemiological research: confounding, effect modification and strength of association. <i>J Fam Plan Reprod Health Care</i> 34: 185-189.</p> <p>Hu FB et al. "Dietary fat and coronary heart disease: A comparison of approaches for adjusting for total energy intake and modeling repeated dietary measurements." <i>Am J Epidemiol.</i> 1999;149-531-40.</p> <p>Assignments: Diet Assessment Project Passed Out</p> |
| <p>Class 5: February 14 Instructor: Tom Lawler</p> | <p>ANALYTIC STRATEGIES TO EVALUATE GENETIC AND OTHER FACTORS MODIFYING DIET AND DISEASE RELATIONSHIPS: Resources for genetic data in epidemiological studies</p> <p>REQUIRED READING: Willett Chapter 14. Willett, W. C. (2002) Balancing life-style and genomics research for disease prevention. <i>Science</i> 296: 695-698.</p> <p>ADDITIONAL OPTIONAL RESOURCES: Cahill, LE and El-Sohehy. A, Genetic variation and nutrient metabolism, In <u>Present Knowledge in Nutrition</u>, Tenth Edition edited by John, W. Erdman, Ian A. MacDonald and Steven H. Zeisel (International Life Science Institute, 2012)</p> <p>Davis, C. D. & Hord, N. G. (2005) Nutritional "omics" technologies for elucidating the role(s) of bioactive food components in colon cancer prevention. <i>J Nutr</i> 135: 2694-2697.</p> <p>Hunter DJ. Gene-environment interactions in human diseases. <i>Nat Rev Genet.</i> Apr 2005;6(4):287-298.</p> |
| <p>Class 6: February 16 Instructor: Julie Mares</p> | <p>MEASUREMENT OF NUTRITIONAL EXPOSURES I: OVERVIEW OF TECHNIQUES; OVERVIEW OF DIETARY EXPOSURES; ASSESSING DIET EXPOSURE WITH BIOLOGICAL MARKERS, ASSESSING DIET: INTRODUCTION AND VARIATION IN DIET</p> <p>REQUIRED READING: Willett W. Nutritional Epidemiology. Chapter 3, "Nature of Variation in Diet" (Overview- not details)</p> <p>Potischman, N. (2003) Biologic and methodologic issues for nutritional biomarkers. <i>J Nutr</i> 133 Suppl 3: 875S-880S.</p> <p>Willett W. Nutritional Epidemiology. Chapter 2, "Nutrients and Food"</p> <p>ADDITIONAL OPTIONAL RESOURCES: Willett W. Nutritional Epidemiology, Chapter 8, Biochemical Indicators of Dietary Intake</p> |

Hartman AM et al. "Variability in nutrient and food intakes among older middle-aged men." *AJE*. 1990;132(5):999-1012.

Assignments: Diet Assessment Project Due

Class 7, 8: February 21 and 23
Instructor: Tara LaRowe

MEASUREMENT OF NUTRITIONAL EXPOSURES II: ANALYSIS OF DIETARY DATA-DAILY AND FOOD FREQUENCY METHODS; NUTRIENT COMPOSITION AND SUPPLEMENT DATABASES

REQUIRED READING (CLASS 7):

Willett W. *Nutritional Epidemiology*. Chapter 5: Food Frequency Methods

Thompson FE, Kirkpatrick SI, Subar AF, et al. The National Cancer Institute's Dietary Assessment Primer: A Resource for Diet Research. *J Acad Nutr Diet*. 2015;115(12):1986-1995.

REQUIRED READING (CLASS 8):

Subar AF, et al., "Comparative validation of the Block, Willett, and National Cancer Institute food frequency questionnaires: the Eating at America's Table Study." *AJE*. 2001;154(12):1089-99.

- o Related Comments: Block_AJE. 2001;154(12):1100-2 and Willett_AJE. 2001;154(12):1105-6.
- o Related Editorial: Byers T. Food frequency dietary assessment: how bad is good enough? *Am J Epidemiol*. 2001 Dec 15;154(12):1087-8.

Willett W. *Nutritional Epidemiology*. Chapter 6 Reproducibility and Validation of Food Frequency Questionnaires

ADDITIONAL OPTIONAL RESOURCES:

Willett W. *Nutritional Epidemiology*. Chapters 4 and 5: 24-hour Recall and Food Record Methods and Food Frequency Methods

Wang DH, Kogashiwa M, Kira S. Development of a new instrument for evaluating individuals' dietary intakes. *J Am Diet Assoc*. Oct 2006;106(10):1588-1593.

Thompson, F. E. & Subar, A. F. (2013) *Dietary Assessment Methodology*. In: (Coulston AM and Boushey CJ, eds) *Nutrition in the Prevention and Treatment of Disease, Second Ed.*, pp. 3-39.

Dwyer, J. & Costello, R. B. (2008) *Assessment of Dietary Supplement Use*. In: (Coulston AM and Boushey CJ, eds) *Nutrition in the Prevention and Treatment of Disease, Second Ed.*, pp. 41-52.

Bingham SA, et al. "Are imprecise methods obscuring a relation between fat and breast cancer?" *Lancet*. 2003;362:212-214.

Thompson FE, et al. "Cognitive research enhances accuracy of food frequency questionnaire reports." *J Am Diet Assoc*. 2002;102:212-225.

Freedman LS, et al. "A comparison of two dietary instruments for evaluation the fat-breast cancer relationship." *Int. J. Epidemiol*. 2006;35: 1011-1021.

Subar AF, et al. "Is Shorter always better? Relative importance of questionnaire length and cognitive ease on response rates and data quality for two dietary questionnaires?" *AJE*. 2001;153:404-9.

Toozee JA, et al. "A new statistical method for estimating the usual intake of episodically consumed foods with application to their distribution." *J Am Diet Assoc*. 2006;106:1575-1587.

References:

Pennington JAT et al., "Food Composition Data: The Foundation of Dietetic Practice and Research." *JADA*. 2007;107:2105-2113.

VandenLangenberg GM, et al. "Influence of using different sources of carotenoid data in epidemiologic studies." *JADA*. 1996;96(12):1271-5.

Byrdwell WC, et al. "Analyzing vitamin D in foods and supplements: methodologic challenges." *AJCN*. 2008;88(suppl):554S-7S.

Slimani, N., Deharveng, G., Unwin, I., Southgate, D. A., Vignat, J., Skeie, G., Salvini, S., Parpinel, M., Moller, A. et al. (2007) The EPIC nutrient database project (ENDB): a first attempt to standardize nutrient databases across the 10 European countries participating in the EPIC study. *Eur J Clin Nutr* 61: 1037-1056.

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| <p>Class 9: February 28 Instructor: Julie Mares</p> | <p>MEASUREMENT OF NUTRITIONAL EXPOSURES III: DISCUSSION OF DIET ASSESSMENT PROJECT: THE ESTIMATION OF AND EFFECTS OF MEASUREMENT ERROR; CALIBRATION AND VALIDATION STUDIES</p> <p>REQUIRED READING:</p> <p><u>Please look at briefly :</u> Kipnis V and Freedman LS. "Impact of Exposure Measurement Error in Nutritional Epidemiology." JNCI. 2008;100:1658-9 and parent article: Lee JE et al. "Fat, Protein, and Meat Consumption and Renal Cell Cancer Risk: A Pooled Analysis of 13 Prospective Studies." J Natl Cancer Inst. 2008;100:1695-1706.</p> <p>ADDITIONAL OPTIONAL RESOURCES: Willett W. Nutritional Epidemiology Chapter 6, "Reproducibility and Validity of Food Frequency Questionnaires and Chapter 12, "Correction for Measurement Error" Millen AE, Midthune D, Thompson FE, Kipnis V, Subar AF. The National Cancer Institute diet history questionnaire: validation of pyramid food servings. <i>Am J Epidemiol.</i> Feb 1 2006;163(3):279-288. McNaughton SA et al. "Validation of a food-frequency questionnaire assessment of carotenoid and vitamin E intake using weighed food records and plasma biomarkers: The method of triads model." <i>European Journal of Clinical Nutrition.</i> 2005;59:211-218. Tsubono Y, et al. "Temporal change in the reproducibility of a self-administered food frequency questionnaire." <i>AJE.</i> 1995;142:1231-5. Kipnis V et al. "Structure of Dietary Measurement Error: Results of the OPEN Biomarker Study." <i>AJE.</i> 2003;153:14-21. Freudenheim JL, et al. Nutrient misclassification: bias in the odds ratio and loss of power in the Mantel test for trend. <i>Int J Epidemiol.</i> 1989 Mar;18(1):232-8.</p> |
| <p>Class 10, 11: March 2. Instructors: Tara LaRowe/Julie Mares</p> | <p>DIET ASSESSMENT RESULTS DISCUSSION 20 minutes</p> <p>A BROADER LOOK AT NUTRITION- DIETARY PATTERNS. TOOLS TO STUDY THEM AND TO EVALUATE THEIR RELATION TO HEALTH AND DISEASE:</p> <p>EXAMINE MAJOR DIETARY PATTERNS WHICH REFLECT: ADHERENCE TO US DIETARY GUIDELINES, MEDITERRANEAN DIET PATTERNS, DASH DIET PATTERNS</p> <p>REQUIRED READING: WILLETT CHAPTER 13, PAGE 319-322.</p> <p>ADDITIONAL OPTIONAL RESOURCES: Moeller S et al. "Dietary patterns: challenges and opportunities in dietary patterns research." <i>J Am Diet Assoc</i> 2007;107(7): 1233-39. Appel LJ, et al., A clinical trial of the effects of dietary patterns on blood pressure. DASH Collaborative Research Group. <i>N Engl J Med.</i> 1997;336:1117-24. de Lorgeril M, et al. Mediterranean Diet, Traditional Risk Factors, and the Rate of Cardiovascular Complications After Myocardial Infarction : Final Report of the Lyon Diet Heart Study. <i>Circulation.</i> 1999 February 16, 1999;99:779-85. Hu FB. "Dietary pattern analysis: a new direction in nutritional epidemiology." <i>Current Opinion in Lipidology</i> 2002;13:3-9. Guenther PM, Casavale KO, Reedy J, et al. Update of the Healthy Eating Index: HEI-2010. <i>J Acad Nutr Diet.</i> Apr 2013;113(4):569-580. Guenther PM et al. "Development of the Healthy Eating Index." <i>J Am Diet Assoc.</i> 2008;108:1896-1901. USDA Healthy Eating Index 2005. Access at http://www.cnpp.usda.gov/HealthyEatingIndex.htm Guenther PM et al. "Evaluation of the Healthy Eating Index." <i>J Am Diet Assoc.</i> 2008;108:1854-1864. Fung, T. T., Willett, W. C., Stampfer, M. J., Manson, J. E. & Hu, F. B. (2001) Dietary Patterns and the Risk of Coronary Heart Disease in Women. <i>Arch Intern Med</i> 161: 1857-1862. Mitrou, P. N., Kipnis, V., Thiebaut, A. C., Reedy, J., Subar, A. F., Wirfalt, E., Flood, A., Mouw, T., Hollenbeck, A. R. et al. (2007) Mediterranean dietary pattern and prediction of all-cause mortality in a US population: results from the NIH-AARP Diet and Health Study. <i>Arch Intern Med</i> 167: 2461-2468. Fogli-Cawley, J. J., Dwyer, J. T., Saltzman, E., McCullough, M. L., Troy, L. M. & Jacques, P. F. (2006) The 2005 Dietary Guidelines for Americans Adherence Index: development and application. <i>J Nutr</i> 136: 2908-2915. Relation to a Health Outcome:</p> |

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| | <p>Fogli-Cawley, J. J., Dwyer, J. T., Saltzman, E., McCullough, M. L., Troy, L. M., Meigs, J. B. & Jacques, P. F. (2007) The 2005 Dietary Guidelines for Americans and insulin resistance in the Framingham Offspring Cohort. Diabetes care 30: 817-822.</p> <p>ASSIGNMENTS Final Project Passed Out</p> |
| Class 12: March 9 Instructor: Julie Mares | <p>HISTORY LESSONS: In search of the Magic Bullet Beta-Carotene, Folate, Fish oils, Vitamin D</p> <p>Groups meet to Discuss Final Projects</p> <p>Midterm Part 2 Due Midtem Part 3 passed out (due 3/30)</p> |
| Class 13: March 14 Instructor: Julie Mares | <p>NUTRITION MONITORING IN THE US</p> <p>REQUIRED READING Willett Chapter 15. National Monitoring and Surveillance</p> <p>ADDITIONAL OPTIONAL RESOURCES Briefel, R., Nutritional Monitoring in the United States, In Present Knowledge in Nutrition, 10th Edition (Erdman, JW, MacDonald, IA, Zeisel, SH, eds.) Washington: International Life Science Institute, 2012</p> |
| Class 14: March 16 | <p>INTERPRETING THE EPIDEMIOLOGIC LITERATURE:</p> <p>FINAL PAPER GROUP 1: To be announced</p> |
| Class 15: March 21 | <p>INTERPRETING THE EPIDEMIOLOGIC LITERATURE:</p> <p>FINAL PAPER GROUP 2: To be announced</p> |
| Class 16: March 23 | <p>INTERPRETING THE EPIDEMIOLOGIC LITERATURE:</p> <p>FINAL PAPER GROUP 3: To be announced</p> <p>EVALUATIONS</p> |