

TUFTS NUTC230 INTERPRETING NUTRITION EVIDENCE

COURSE SYLLABUS, SPRING 2018

Welcome to **Nutrition C230, Interpreting Nutrition Evidence**. This syllabus serves as your outline for the course, and includes what you can expect to learn and do (i.e., what you may expect of me and the lecture schedule), as well as my expectations of you as a student (i.e., active participation and engaged learning, and a list of readings and assignments).

Since you are not required to be physically present in classes, you must have access to a reliable computer/device and internet connection to access prerecorded lectures and course materials. The online learning management system used for administering this course is called **Canvas** (canvas.tufts.edu). If you've previously taken a Tufts course, you likely have your log-in information already.

COURSE DIRECTOR

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COURSE GOALS AND OBJECTIVES

The primary purpose of this course is for you to learn how to interpret nutrition evidence (mostly involving humans, with a few other animal studies for good measure) for lay audiences—those who may read or rely on your work to guide their own nutrition-related behaviors or professional decision-making. The basis of interpreting nutrition evidence lies in having the ability to *read*, *understand*, and *interpret* literature published in peer-reviewed journals. By the end of this course, you will be able to analyze a nutrition manuscript, identify related literature, describe the manuscript's major strengths and weaknesses, and finally, write articles targeted to non-scientific audiences that responsibly convey the manuscript's importance, both within a broader context as well as its specific implications for your reader, using non-technical language, so as to positively affect health and well-being. More specifically, you will:

- Understand and appreciate the importance of peer review and how it relates to credible sources of scientific research
- Learn to identify, where to search for, and how to find peer-reviewed literature
- Understand study designs in nutrition research, their major strengths and weaknesses, and the hierarchy of study design
- Understand basic statistical terms and their implications, including concepts of statistical significance and P values, means and variability, correlations, regression coefficients, and so on
- Critically evaluate, interpret, summarize, and explain results published in research articles in health and nutrition journals that are influencing nutrition science, research, policy, and clinical practice
- Identify elements of nutrition studies that are key to appropriately interpreting them, and the elements of nutrition studies that are “open to interpretation”
- Be able to review and analyze how nutrition and health journal articles are subsequently presented by public relations and the media

RESOURCES

READINGS

All assigned readings listed on the schedule will be available for the duration of the semester on **Canvas** (as PDFs or via links), or via the Hirsch Health Sciences Library access system, in cases where finding the literature is part of the assignment. In this course, we rely on peer-reviewed articles published in major medical and nutrition journals. Reading lots of studies, although uncomfortable and confusing at first, is the *best way* to get comfortable with them and grasp the approach that scientists take when they write about their science. In fact, it's precisely what all nutrition students themselves have to practice regularly in what's known as "Journal Club."

Recommended Text:

Swinscow, TDV, *Statistics at Square One*, Ninth Edition, BMJ Publishing Group, 1997.

Accessible for **free** at <http://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one>. If you are not at all familiar with statistics, this small manual is a great place to begin. Hard copy and Kindle editions are available on Amazon.com.

Optional Text:

Miller, JE. *The Chicago Guide to Writing about Multivariate Analysis*. University of Chicago Press, 2005

This is an all-around useful text to understand what makes for good scientific writing. If only every scientist read this, peer review would be a much easier process. If you don't happen to find it exceptionally useful, pass it along to your scientist friends.

Girden, ER, Kabacoff, RI. *Evaluating Research Articles from Start to Finish*. 3rd Edition. Sage Publications, 2011.

This book explains many study designs and analytic methods, alongside presenting critiques and case studies of research articles.

LIBRARY RESOURCE PAGE

The extraordinary librarians at Hirsch Health Sciences Library have created a very useful series of pages specifically for this course. There are links to major nutrition stakeholders, interesting blogs, databases, citation tools, citation formatting, etc. **Bookmark this link today!** <http://researchguides.library.tufts.edu/nutr230c>

TECHNICAL SUPPORT

Technical support is provided by Canvas in collaboration with the Office of Academic Initiatives. You can and should contact Canvas Support for all technical issues. You should anticipate at least a 6-hour wait before hearing back regarding a technical support request, although emails are typically returned in significantly less time. When emailing a technical support problem, please include as much information as possible (operating system, browser and version, a detailed description of the problem) and please be specific so they can expedite the troubleshooting process for you. You should only use your Tufts email address when submitting support tickets. If you did not receive a Tufts email, then please use the email account that is associated with your Canvas account.

Telephone: 617.636.2415 or 617.636.4058

Email: canvas@tufts.edu

Hours: 9:00am to 5:00pm EST/EDT, Monday through Friday (Canvas Support will check for support tickets on the weekends, but typically will not respond until Monday morning unless it is an emergency.)

ASSIGNMENTS AND GRADING

MEASURING SUCCESS

The assignments and discussions for this course are designed to allow you to practice and demonstrate that you understand the course and module objectives. They are both reflective and evaluative. Please refer to the “Schedule of Lectures, Readings, and Assignments” later in this document for details.

Contributing to your final grade are:

Discussions (5 total, 10 points each)	35%
Assignments (6 total, 10 points each)	35%
Final Assignment (100 pts)	30%

Final letter grades (A+ through F) for the course will be assigned based on the following criteria (we round up):

90–100	A range (90–<93 = A-, 93+ = A, A+ given for superlative work)
80–89	B range (80–<83 = B-, 83–<87 = B, 87–<90 = B+)
70–79	C range (70–<73 = C-, 73–<77 = C, 77–<80 = C+)
60–69	D range (60–<63 = D-, 63–<67 = D, 67–<70 = D+)
<60	F

SUBMITTING ASSIGNMENTS

Written assignments, except for discussion transcripts/videos, should be submitted in Word, 1-inch margins, 11-point font, single-spaced, on the Canvas site. All assignments, quizzes, discussion postings, etc., must be submitted by **Sunday** the week they are assigned, no later than **11:59PM EST/EDT** or your local time, whichever is later, unless otherwise specified (e.g., term assignment has an end-of-semester due date). Please let me know if you are taking the course in a time zone other than the east coast of the U.S. Late assignments will be accepted; however, 10% will be deducted for every day late. That said, if you have extenuating circumstances, just talk to me.

DISCUSSION INSTRUCTIONS

Discussions—particularly video chats—are one of the best ways to get to know your colleagues and create connections that are otherwise challenging to create in the context of an online classroom. Note that your discussion participation counts for a large portion of your grade: 35%! Discussion groups will include 3–5 of your classmates (group assignments will be made the first week of class mostly based on time zone), and it will be up to the group to select a 30–45-minute period in a given week to conduct the discussion. This can happen on Saturday mornings over coffee at your respective homes, for example, at midnight on Tuesdays, or on your lunch break on Thursdays. It really doesn’t matter to me, so long as you find a time at which each of you can *concurrently* actively participate. It may be helpful to set your discussion schedule for the duration of the semester, and stick to it.

Discussions are to take place online, in any **recordable** medium you choose. The easiest tool for these discussions is **WebEx** (<http://tufts.webex.com>) for which your Tufts UTLN and password serve as your log-ins. (Note that just going to Webex.com without the *Tufts* prefix won’t give you the same functionality or options, and will require you to generate a unique, non-Tufts log-in, or to pay for the service, so be sure use <http://tufts.webex.com>.) WebEx allows you to record your conversations and email me the link to the recording so that I can watch it, give you feedback, and answer any questions that came up. (Note that whoever initiates the WebEx meeting, as the moderator, will be responsible for hitting the “record” button and then emailing me the link.) Alternatively, you and your group may opt to use the **chat** rooms on Canvas, **gchat**, or record a **Google Hangout** or **Skype**. At the end

of every discussion, one group member (choose amongst yourselves) will let me know you've completed your discussion by sending me a link to the video of your discussion (if done on WebEx or Google Hangouts), or sending me the text of your chat (if done on Canvas or gchat, for example).

If a *synchronous* discussion is absolutely impossible in given week owing to work/life, please use the online **Forum** (not chat rooms) on Canvas to conduct your discussion. Discussions are graded according the "Discussion Grading Rubric," located on Canvas. Discussion guidelines and questions relevant to a particular week's topic will be distributed ahead of time, as necessary. Please remember to contribute in a professional and constructive way, particularly in the face of disagreement.

NUTC 230 has been using WebEx for synchronous discussions for the last 4 years, and it has been very well received by students, so we are continuing to implement the approach this year. If, however, it proves unfeasible for the majority of students/groups over the course of the semester, we will modify our discussion approach accordingly. As we live with responsibilities outside of this class, a synchronous discussion may not be possible for every member of every group each week a discussion is assigned. Instructions for how to manage such contingencies will follow.

Lastly, I plan to drop in on a discussion or two, or more, of each discussion group over the course of the semester.

ACADEMIC INTEGRITY

You are expected to complete all assignments independently, that is, without the assistance of another human (including fellow students, faculty, anonymous online folk, etc.), unless otherwise noted. (Discussions, obviously, are one such exception.) All documents used in preparing your work must be properly referenced (see "Formatting Assignments" above). Please refer to the Tufts University Academic Integrity Policy at <http://students.tufts.edu/student-affairs/student-life-policies/academic-integrity-policy> and to the Friedman School's Policies and Procedures manual (<http://nutrition.tufts.edu/student/documents>). Instructors and other university personnel may request that students submit written assignments to plagiarism prevention resources, websites, or other authoritative databanks, such as (but not limited to) "turnitin.com," or a similar site. These services compare student-produced documents with web content, newspapers, journals, magazines, books, student essays, and other data to determine the originality of student work.

MODULES AND LEARNING OBJECTIVES

The course begins on January 17 and continues through “Final Exam Week” (April 17–23). The course is organized around the principle study designs, in 5 modules, with accompanying case studies and additional material presented each week:

- 1 The Basics
- 2 “Other” Study Designs
- 3 Trials
- 4 Cohort Studies
- 5 Case-Control Studies

Case studies, used through most of the course, are designed to allow each of you to acquire greater skill in interpreting nutrition evidence by examining previous examples of both “good” and “bad” interpretations of nutrition science. Through case studies, students will be able to:

- Apply skills they have acquired to interpret and communicate study design, methodology, statistics, and discussions of nutrition science manuscripts
- Understand pitfalls and opportunities in the communication of nutrition science to lay audiences
- Evaluate press releases and media reports related to nutrition science manuscripts for validity and accuracy of messaging
- Discuss ramifications of poorly interpreted science

MODULE 1. THE BASICS

Weeks 1 through 3. In this module, we cover some essential topics and skills that will help you succeed in the rest of the course, and we’ll review, with the broadest of brushes, epidemiology and basic study designs. First up is covering how to locate and navigate the vast scientific literature—which can be overwhelming even for seasoned scientists. Staying on top of the literature and navigating the immense resources we have at our fingertips can be quite daunting for everyone. This module presents a hands-on tutorial on how to find peer-reviewed articles, search for specific topics, discern which articles are appropriate to your topic, use popular citation software to keep track of your sources, and stay on top of the emerging literature. This module also closes with a review of epidemiology and basic study designs.

Learning Objectives. Students will:

- Be familiar with scientific literature databases as well as news media and other databases
- Know how to access, navigate, and optimize library resources
- Know how to conduct a search for relevant scientific literature
- Understand the concept of peer review and how to confirm which journal articles are peer-reviewed
- Identify credible sources of scientific literature
- Identify appropriate sources for various health indices (e.g., national prevalence estimates)
- Use citation/reference software to keep track of sources
- Have a system in place to keep up with nutrition science (e.g., hunting, foraging, having it delivered)
- Understand in general terms how epidemiology, as a discipline, is applied to nutrition science, as well as its clinical, community, and public health applications
- Understand the notion of “population perspective” and its relevance to clinical, community, and public health applications

- Know and understand terms, including risk factor/exposure/determinant; and outcome/endpoint/event
- Understand the idea of the natural history of disease (for nutrition as medicine) and nuances of public health/community-based efforts (for nutrition as public health intervention), and why these concepts are crucial to evaluating appropriateness of study design
- Become familiar with basic descriptive epidemiology, such as prevalence and incidence
- State the major epidemiologic study designs, and know how to classify them into observational versus intervention, analytic vs. descriptive

MODULE 2. “OTHER” STUDY DESIGNS

Weeks 4 through 5. This module of the course starts our dive into specific study designs that are ubiquitous but toward the bottom of the evidence hierarchy, yet nevertheless often generate sensational headlines. We use two case studies of these “other” study designs to guide us through two critical skill sets when approaching scientific literature. These two skill sets include 1) understanding how scientific manuscripts are structured and presented; and 2) understanding what questions each section of a manuscript should answer for the reader (i.e., what information each section should provide). We learn to understand how a manuscript is constructed, the information presented in each section, and how to look for critical and relevant information you need to inform your own work. Critical questions, such as “Do the tables and figures match the text?”, “Do the results actually match what the authors are telling you their results say?”, “Are the authors’ conclusions justified by the results, and in the context of existing literature?”, and of course, “So what?” These case studies are centered on the manuscript, and are accompanied by press releases or editorial comments, as well as traditional and non-traditional media pieces about, ostensibly, the results of the manuscript, although as you will discover, this is not always the case.

Learning Objectives. Students will be able to:

- Be critical readers of nutrition-related medical and public health literature
- Know how a publication flows and the rationale for its presentation
- Know how to evaluate a given study, given its study design and described components
- Identify the critical pieces of information—what should be in a manuscript and what may be missing in order to conduct a reasonable evaluation
- Read and interpret figures and tables
- Begin to understand pitfalls and opportunities in the communication of nutrition science to lay audiences
- Begin to evaluate press releases and media reports related to nutrition science manuscripts for validity and accuracy of messaging
- Discuss ramifications of poorly interpreted science
- Describe an ecological study design and discuss its strengths and limitations

MODULE 3. TRIALS

Weeks 6 through 8. In this module we review the “gold standard” of studies in nutrition and medicine, the randomized controlled trial. We will leverage one very large, complicated trial, and a second smaller trial in two case studies to highlight key components of this study design and to begin to understand the view science takes in approaching questions, as well as basic statistical terms that are key to reading and interpreting results. Ongoing are exercises in reading press releases and related media to compare manuscript results versus what’s said about them (i.e., compare what’s written for other scientists versus what’s written for public consumption).

Learning Objectives. Students will be able to:

- In trials, understand the importance of randomization and placebo-control

- Know why and where trials are registered
- Understand the importance of blinding
- Discuss the strengths and limitations of trials, especially in nutrition
- Understand the importance and relevance of generalizability of the study population
- Understand potential reasons for disparate findings between studies, trials included
- Place individual studies within context of a larger body of evidence
- Understand the foundations of the scientific method of inquiry
- Explain the basics of the scientific method and hypothesis testing
- Summarize basic statistical tests (t-tests, paired t-tests, non-parametric counterparts, and chi-squared tests), and how to interpret the results
- Summarize basic tests of association and how to interpret the results
- Explain why a specific statistical test was used in a given study
- Interpret P values and confidence intervals to assess the role of chance

MODULE 4. COHORT STUDIES

Weeks 9 through 10. In this module we review cohort studies in nutrition. Again, we will leverage two manuscripts (in the context of case studies) to highlight key components of this study design, as well as how and why this study design has driven much of what we know about diet’s relationship with health and disease. Concurrently, we review some additional critical terms and how they impact our interpretation of the literature: bias, confounding, precision, validity, risk, and odds. As with trials, we continue in our exercises in reading press releases and related media to compare results of cohort study manuscripts versus what is said about them. Finally, we begin the odyssey of developing your own case study.

Learning Objectives. Students will be able to:

- Understand the key design components of cohort studies
- Understand the importance of researcher blinding
- Discuss the strengths and limitations of cohort studies, especially in nutrition
- Understand the importance and relevance of generalizability of the study population
- Explain the differences between precision and validity (distinguish between bias and precision)
- Distinguish between external validity (generalizability) and internal validity
- Define the major types of epidemiologic bias—confounding, selection bias, and information bias
- Understand what study design features can avoid bias
- Identify researcher strategies to address confounding
- Discuss the framework for assessing valid statistical association using alternative explanations of chance, bias, and confounding
- Be able to define risk and odds, how to calculate them and interpret them

MODULE 5. CASE-CONTROL STUDIES

Weeks 11 through 13. In this closing part of the course, we focus on the last of the major epidemiological study designs, the case-control study. As in previous weeks, we learn about this study design in the context of a case study, with the accompanying press release and media. In addition, these last few weeks of the course are designed to allow each of you to acquire greater skill in interpreting nutrition evidence by fully developing and focusing on a case study of your choosing.

Learning Objectives. Students will be able to:

- Understand the key distinguishing design elements of a case-control study

- Understand the importance and relevance to generalizability of the study population in case-control studies, where it's the method of selection of cases and controls that is key
- With the major study designs now covered, explain the differences between study designs and the kind of information that can be attained through each of them
- Know why some study designs are feasible, while others are not
- Discuss the strengths and limitations for each study design
- Identify which study design is used in a given article
- Apply skills you have acquired to understand study design, methodology, statistics, and discussions of nutrition science manuscripts, and how to interpret these manuscripts for lay audiences

SCHEDULE OF LECTURES, READINGS, AND ASSIGNMENTS

Lectures, readings, and assignments (including discussions) are to be completed in the week they are assigned and are due by Sunday, midnight, at the end of that week, unless specific assignment deadlines are indicated. Readings are posted on Canvas unless finding them is a part of your assignment.

Wk	Start Date	To Do	Details
MODULE 1			
1	Jan 22	Lectures	<ol style="list-style-type: none"> 1. Introduction to the Course and to Module 1 2. Getting to Know Databases and Other Resources 3. Searching for Information
		Readings	<p>1. Get familiar with the Canvas course site as well as the course library resources page: http://researchguides.library.tufts.edu/nutr230c</p> <p><i>The following are not required, but serve as a warm-up and orientation to our food climate (best read in order):</i></p> <ol style="list-style-type: none"> 1. 2015 Scientific Report of the Dietary Guidelines Advisory Committee: http://health.gov/dietaryguidelines/2015-scientific-report/ (if nothing else, read the Executive Summary) 2. Teicholz, N. The scientific report guiding the US dietary guidelines: is it scientific? <i>BMJ</i> 2015; 351: h4962. http://www.bmj.com/content/351/bmj.h4962 3. Request for <i>BMJ</i> to retract Teicholz piece (note signatories): http://cspinet.org/bmj-retraction-letter.html 4. 2015 Dietary Guidelines: http://health.gov/dietaryguidelines/2015/guidelines/ (if nothing else, read the Executive Summary – and see if you can answer this question: how do the guidelines differ from the scientific report?) 5. Reaction to <i>DG</i> from Frank Hu, a member of the DGAC and co-author of the <i>Scientific Report</i>: http://www.hsph.harvard.edu/news/features/assessing-the-new-u-s-dietary-guidelines/ 6. Reaction from David Katz: http://www.huffingtonpost.com/david-katz-md/2015-dietary-guidelines-a_b_8930098.html
		Assignment	<p>#1: Complete the “Getting to Know You” questionnaire at: https://tufts.qualtrics.com/jfe/form/SV_bmh7VQlj18enx9b as soon as possible. The password is “NUTC230”. (Due at the latest by January 28.)</p>
		Discussion	None.
2	Jan 29	Lectures	<ol style="list-style-type: none"> 1. Peer Review and Credible Sources 2. Citing Your Sources 3. Keeping Up with the Literature
		Readings/ Other	<ol style="list-style-type: none"> 1. Kotwani, N. The Media Miss Key Points in Scientific Reporting. <i>Virtual Mentor</i>. 2007; 9(3): 188-192. Accessible at: http://journalofethics.ama-assn.org/2007/03/jdsc1-0703.html 2. Freedman, DH. “Lies, Damned Lies, and Medical Science.” <i>The Atlantic Monthly</i>.

Oct 4 2010. Accessible at <http://www.theatlantic.com/magazine/archive/2010/11/lies-damned-lies-and-medical-science/308269/>

3. Gutting, G. "What Do Scientific Studies Show?" *The New York Times*. Apr 25, 2013. Accessible at <http://opinionator.blogs.nytimes.com/2013/04/25/what-do-scientific-studies-show/>

4. Oransky, I. How Publish or Perish Promotes Inaccuracy in Science—and Journalism. *AMA Journal of Ethics*. 2015; 17(12): 1172-1175. Accessible at <http://journalofethics.ama-assn.org/2015/12/sect1-1512.html>

5. Watch John Oliver on scientific studies (caution: vulgar language): <https://www.youtube.com/watch?v=0Rnq1NpHdmw>

Assignment **#2: Set up** 2–3 citation alerts, 2–3 TOC alerts, and 2–3 subject area/author alerts, to get you started on keeping track of emerging nutrition science literature. **Upload to your Canvas drop box folder a document** named "LastName_Assignment2" describing your alerts and why you've selected those particular resources (2–3 sentences per resource). *There is an example of this in the assignments folder.*

Discussion **#1: Introduce** yourself to your colleagues. **Discuss** with your group the resources you've selected, why you've selected them, what you especially like about the resources. Discuss with your colleagues the sources that you regularly check/use for nutrition/health science information, and whether you think they are neutral or present a particular bias. Discuss your thoughts on the readings for last week and this week. What is your current view on the understanding of science by the lay public? What are key issues you see as members and observers of the public? What are key issues scientists and media should be aware of when conveying information? Remember to record the conversation and email the link to me.

- 3 Feb 5 Lectures**
1. Epidemiology, a Brief Intro
 2. Outline and Hierarchy of Epidemiologic Study Design, Part 1
 3. Outline and Hierarchy of Epidemiologic Study Design, Part 2

Readings None.

Assignment **#3: Find** 3 different papers on the nutrition topic of your choice. Classify each paper into one of the categories of study designs discussed in the lectures (specifically, a trial, a cohort study, and a case-control study), without repeating the same study design (you may need to review >3 papers to complete the assignment). For each paper, **provide** a) the citation, b) the type of study it is, and c) describe the key characteristics of the paper that indicate its design. Then **answer** the following questions: 1) Could you identify an alternative study design the authors might have used to answer their question? 2) Would a different study design have been better or worse option than the one they used? *There is an example of this in the assignments folder.*

Discussion None.

MODULE 2

- 4 Feb 12 Lectures**
1. Introduction to Module 2 and Our Case Study Approach

2. "Other" Study Designs
3. Case Study 1, "Magic Beans"? (watch the following *after* you have read the case)
 - 2A. The Abstract and Introduction
 - 2B. The Methods
 - 2C. The Results
 - 2D. The Discussion and Conclusions
 - 2E. PR and Media

**Readings/
Other**

1. Watch John Oliver on nutritional supplements (caution: vulgar language):
<https://www.youtube.com/watch?v=WA0wKeokWUU>
2. Case Study 1: "Magic Beans"?

Manuscript: Mubarak, A, et al. Supplementation of a High-Fat Diet with Chlorogenic Acid Is Associated with Insulin Resistance and Hepatic Lipid Accumulation in Mice. *J Agric Food Chem.* 2013; 61(18):4371-8. doi: 10.1021/jf400920x.

PR 1: University of Western Australia. "The right amount of coffee." Posted on May 30, 2013. Accessible at <http://www.news.uwa.edu.au/201305305718/research/right-amount-coffee>.

PR 2: American Chemical Society. "Lab experiments question effectiveness of green coffee bean weight-loss supplements." Posted on June 12, 2013. Accessible at http://www.eurekalert.org/pub_releases/2013-06/acs-leq061213.php.

Note the strange PR dates. The study was published on 4/15/2013. The PR from UWA is dated 5/30/2013, over a month later. The PR from ACS is dated 6/12/2013, almost 2 months after the study appeared. At least one of the media pieces is dated 5/26/2013. How did the media find out about this study before the PRs were issued? Was there yet a PR predating these that had poor messaging, and these were later released to correct that? Did the media break the embargo, if there was one?

Media: Cann, Linda. "Wrong amount of coffee could kill you" PerthNow. Posted on May 27, 2013 8:59AM. Accessible at: www.perthnow.com.au/lifestyle/health-fitness/coffee-linked-to-deadly-fat/story-fnhqg9db-1226650453552

Media: FirstPost. "Drinking 5 cups of coffee everyday may lead to obesity: study." Posted on May 26, 2013. Accessible at: http://www.firstpost.com/living/drinking-5-cups-of-coffee-everyday-may-lead-to-obesity-study-816431.html?utm_source=hp-footer

Media/Blog: Butterworth, Trevor. "Worst. Reported. Study. Ever." Posted on June 7, 2013 12:42PM. Accessible at: <http://www.forbes.com/sites/trevorbutterworth/2013/06/07/worst-reported-study-ever/>

Assignment None.

Discussion None.

5	Feb 19	Lectures	<p>1. Case Study #2: Chocolate and Nobels (watch the following <i>after</i> you have read the case)</p> <p>2A. The Abstract and Introduction</p> <p>2B. The Methods</p> <p>2C. The Results</p> <p>2D. The Discussion and Conclusions</p> <p>2E. PR and Media</p> <p>2. Association and Causality</p>
		Readings	<p>1. "How to Critically Review a Research Paper" (Word doc on Canvas – read/get familiar with this document <i>before</i> watching the case study lectures!).</p> <p>2. Case Study #2: Chocolate and Nobels</p> <p>Manuscript: Messerli, FH. Chocolate Consumption, Cognitive Function, and Nobel Laureates. <i>N Engl J Med</i>, 2012; 367(16): 1562–1564.</p> <p>Media: Pritchard, C. "Does chocolate make you clever?" <i>BBC News</i>. Posted on November 19, 2012. Accessible at http://www.bbc.com/news/magazine-20356613</p> <p>Media: Weisenthal, J. "There's a shocking connection between eating more chocolate and winning the Nobel Prize." <i>Business Insider</i>. Posted on April 20, 2014. Accessible at http://www.businessinsider.com/chocolate-consumption-vs-nobel-prizes-2014-4</p> <p>Media/Blog: Jogalekar, A. "Chocolate consumption and Nobel Prizes: a bizarre juxtaposition if there ever was one." <i>Scientific American</i>. Posted on November 20, 2012. Accessible at http://blogs.scientificamerica.com/the-curious-wavefunction/chocolate-consumption-and-nobel-prizes-a-bizarre-juxtaposition-if-there-ever-was-one/</p>
		Assignment	<p>#4: Choose one of the first two media pieces (either the BBC piece or the Business Insider piece) and rewrite it using the same style, length, audience, etc. to reflect the actual science (method, results, conclusions) while engaging the reading public.</p>
		Discussion	<p>#2: Discuss with your group the assigned readings of <u>Case Study #1 and #2</u>, in particular, what you do and don't understand, what confuses you, what you think the researchers meant, and why the results were interpreted the way they were. How do the media add/detract to our understanding of the study? What do you wish you knew or understood about the science, history of research, or the methodology to help you choose the interpretation that's "correct"?</p>
MODULE 3			
6	Feb 26	Lectures	<p>1. Introduction to Module 3</p> <p>2. The Scientific Method</p> <p>3. Trials</p>
		Readings	<p>1. Rowe, SB, Alexander, N. Communicating Nutrition and Other Science: A Reality</p>

			Check. <i>Nutrition Today</i> , 2016; 51(1):29–32.
		Assignment	<p>Read over the Final Assignment (see “Final Assignment” in the Assignments folder on Canvas), and begin thinking about a nutrition topic with media exposure that you’re very interested in, that you’d like to cover in a case study of your own. <i>No related material due now.</i></p> <p>Also, you might want to get a head start on next week’s assignment and Case Study #3.</p>
		Discussion	None.
7	Mar 5	Lectures	<ol style="list-style-type: none"> 1. Case Study #3: Is Breastfeeding Best? (watch <i>after</i> you have read the case) 2. Data, Displays, Distributions, Populations, and Descriptive Statistics
		Readings	<ol style="list-style-type: none"> 1. (Optional) Swinscow, TDV, <i>Statistics at Square One</i>, 9th Edition, BMJ Publishing Group, 1997. Accessible for free at http://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one: Chapters 1-3. 2. Case Study #3: Is Breastfeeding Best? <ul style="list-style-type: none"> Manuscript: Perkin, MR, et al. Randomized Trial of Introduction of Allergenic Foods in Breast-Fed Infants. <i>NEJM</i>. 2016; 374:1733-1743. <i>It’s important that you also scan through the MASSIVE protocol and appendix for this manuscript (also on Canvas), so that you have an idea of how much effort went into conducting this trial (and every trial, really).</i> Editorial: Wong, GWK. Preventing Food Allergy in Infancy—Early Consumption or Avoidance? <i>NEJM</i>. 2016; 374:1783-1784. PR: King’s College London. “Giving allergenic foods to infants from 3 months may prevent allergies.” Posted March 4, 2016. Accessible at http://www.kcl.ac.uk/newsevents/news/newsrecords/2016/03%20March/Giving-allergenic-foods-to-infants-from-3-months-may-prevent-allergies.aspx Media: Davis, N. “Early introduction of peanuts and eggs cuts allergy risk, study finds.” <i>The Guardian</i>. Posted March 4, 2016. Accessible at https://www.theguardian.com/society/2016/mar/04/early-introduction-peanuts-eggs-cuts-allergy-risk-eat-study Media: Paculaba, AM. “Breast Milk Can Cause Food Allergies in Babies.” <i>Parent Herald</i>. Posted March 8, 2016. Accessible at http://www.parentherald.com/articles/26445/20160308/breast-milk-cause-food-allergies-babies.htm
		Assignments	#5: Answer the questions in “How to Critically Review a Research Paper” for Case Study #3 (assigned above). Be sure to write your answers in language for a lay audience (8th-grade reading level; think <i>USA Today</i>). <i>There is an example of this in the assignments folder.</i>
		Discussion	#3: Discuss with your group the assigned readings of <u>Case Study #3</u> : what you do and don’t understand, what confuses you, what you think the researchers meant, and why the results were interpreted the way they were. How do the editorial, PR, and media add/detract to our understanding of the study? What do you wish you knew or understood about the science, history of research, or the

methodology to help you choose the interpretation that's "correct"?

8 Mar 12 Lectures

1. Case Study #4: Is Your Magnifying Glass Big Enough? (watch *after* you have read the case)
2. Confidence Intervals, the Null Hypothesis, and P values
3. Basic Statistical Tests and Method

Readings

1. *Relevant sections in* American College of Physicians, American Society of Internal Medicine. Compendium of Primers. *Effective Clinical Practice*, 1999–2000 (as a single PDF).
2. *To illustrate significance and intervals:* Vaux, DL. Research Methods: Know When Your Numbers Are Significant. *Nature*. 2012;492: 180–181. DOI:10.1038/492180a
3. (*Optional*) Swinscow, TDV, *Statistics at Square One*, 9th Edition, BMJ Publishing Group, 1997. Accessible for free at <http://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one>: Chapters 4–8, 11, and 13.
4. Case Study #4: Is Your Magnifying Glass Big Enough?

Manuscript: Veum, VL, Laupsa-Borge, J, Eng, O, Rostrup, E, Larsen, TH, Nordrehaug JE, Nygard, OK, Sagen, JV, Gudbrandsen, OA, Dankel, SN, Mellgren, G. Visceral adiposity and metabolic syndrome after very high-fat and low-fat isocaloric diets: a randomized controlled trial. *Am J Clin Nutr*. doi: 10.3945/ajcn.115.123463

PR: Hagerup, I. "Saturated fat could be good for you, study suggests." University of Bergen, Science Daily. Posted December 2, 2016. Accessible at <https://www.sciencedaily.com/releases/2016/12/161202094340.htm>

Media: de Graaf, Mia. "Saturated fat IS good for you, study claims: Controversial research shows butter boosts good cholesterol levels." DailyMail.com. Posted December 2, 2016. Accessible at <http://www.dailymail.co.uk/health/article-3994850/Saturated-fat-good-study-claims-Controversial-research-shows-butter-boosts-good-cholesterol-levels.html>

Media: Gray, N. "Fresh study suggests saturated fat could be good for you." FoodNavigator.com. Posted December 5, 2016. Accessible at <http://www.foodnavigator.com/Science/Fresh-study-suggests-saturated-fat-could-be-good-for-you>

Assignment

#6: Rewrite the press release of Case Study #4 using the same style, length, audience, etc. to reflect the actual science (method, results, conclusions) while engaging members of the media.

Discussion

None.

MODULE 4

9 Mar 19 Lectures

1. Cohort Studies
2. Case Study #5: Tracking nutritional health in the developing world (watch *after* you have read the case)
3. Risk, Odds, and Their Interpretation

	Readings	<p>1. <i>To illustrate communicating uncertainty</i>: Folker, AP, and Sandøe, P. Leaping “Out of the Doubt” —Nutrition Advice: Values at Stake in Communicating Scientific Uncertainty to the Public. <i>Health Care Analysis</i> 2008; 16(2): 176–191.</p> <p>2. <i>Discussing some challenges of communicating risk</i>: Rowe, SB, and Alexander, N. Nutrition/Health Risk Communication Revisited: Are You Communicating Like Spock or Captain Kirk? <i>Nutrition Today</i> 2015; 50(5):247–249.</p> <p>3. Case Study #5: Tracking nutritional health in the developing world</p> <p>Study: Adair, LS, Fall, CHD, Osmond, C, Stein, AD, Martorell, R; <i>et al.</i> Associations of linear growth and relative weight gain during early life with adult health and human capital in countries of low and middle income: findings from five birth cohort studies. <i>The Lancet</i>, 2013; 382(9891): 525–534.</p> <p>Editorial/Comment: Bhutta, ZA. Early nutrition and adult outcomes: pieces of the puzzle. <i>The Lancet</i>, 2013; 382(9891): 486–487.</p> <p>PR: “Higher birthweight and early life growth spurts protect against chronic diseases in later life.” From <i>The Lancet</i> News Room. Posted March 27, 2013. Accessible at https://www.eurekalert.org/pub_releases/2013-03/l-hba032513.php.</p> <p>Media (brief mention only): Morris, S. We can’t achieve the Global Goals without a focus on child nutrition. <i>The Guardian</i>. Posted November 20, 2015. Accessible at https://www.theguardian.com/global-development-professionals-network/2015/nov/20/we-cant-achieve-the-global-goals-without-a-focus-on-child-nutrition.</p>
	Assignment	<p>Turn in Final Assignment, part I (20% of total points of Final Assignment), due at the end of this week. See “Final Assignment Instructions” on Canvas.</p>
	Discussion	None.
<p>10 Mar 26</p>	<p>Lectures</p> <p>Readings</p>	<p>1. Case Study #6: On Butter (watch <i>after</i> you have read the case)</p> <p>2. Bias and Confounding</p> <p>1. Case Study #6: On Butter (the saturated fat saga continues)</p> <p>Context: Bittman, Mark. “Butter Is Back.” <i>New York Times</i>, March 25, 2014. https://www.nytimes.com/2014/03/26/opinion/bittman-butter-is-back.html</p> <p>Manuscript: Li, Y, et al. Saturated fat as compared to unsaturated fats and sources of carbohydrates in relation to risk of coronary heart disease: A prospective cohort study. <i>J Am Coll Cardiol</i>. 2015; 66(14): 1538–1548.</p> <p>Editorial/Comment: Vogel, RA. Pharma Versus Farmer: Food as Heart Medicine. <i>J Am Coll Cardiol</i>. 2015; 66(14): 1549-1551.</p> <p>PR: Harvard School of Public Health. “Butter is not back: Limiting saturated fat still best for heart health.” Released September 28, 2015. Accessible at: http://www.hsph.harvard.edu/news/press-releases/butter-is-not-back-limiting-saturated-fat-still-best-for-heart-health/</p>

Media 1: Boodman, Eric. "Replace bad fats with good foods for heart health, study says." *STAT*. Posted on September 28, 2015. Accessible at: <http://www.bostonglobe.com/metro/2015/09/28/replace-bad-fats-with-good-foods-for-healthy-heart-study-shows/PKczKjreFQHfxSdyZ0H1xJ/story.html>

Media 2: Park, Alice. "Confused About Fat and Heart Disease? This Study Explains Why". *TIME Magazine*. Posted on September 28, 2015. Accessible at: <http://time.com/4052306/saturated-fat-heart-disease/>

Assignment **Turn in** Final Assignment, **part II** (20% of total points of Final Assignment), due at the end of this week. See "Final Assignment Instructions" on Canvas.

Discussion **#4: Discuss** with your group the assigned readings of Case Study #5 and #6, in particular, what you do and don't understand, what confuses you, what you think the researchers meant, and why the results were interpreted the way they were. How do the media add/detract to our understanding of the study? What do you wish you knew or understood about the context of this research, the science itself, or the methodology to help you choose the interpretation that's "correct"?

MODULE 5

11	Apr 2	Lectures	<ol style="list-style-type: none">1. Introduction to Module 52. Case-Control Studies3. Case Study #7: Expanding Our Horizon: Studying an Aspect of the Food System (watch <i>after</i> you have read the case)
		Readings	<ol style="list-style-type: none">1. Case Study #7: Expanding Our Horizon: Studying an Aspect of the Food System Study: Shelton, JF, Geraghty, EM, Tancredi, DJ, Delwiche, LD, Schmidt, RJ, Ritz, B, Hansen, RL, and Hertz-Picciotto, I. Neurodevelopmental Disorders and Prenatal Residential Proximity to Agricultural Pesticides: The CHARGE Study. <i>Environ Health Perspect.</i> 2014; 122(10): 1103–1009. PR: University of California-Davis Health System. "Study finds association between maternal exposure to agricultural pesticides." Released June 23, 2014. Accessible at https://www.eurekalert.org/pub_releases/2014-06/uoc--sfa061014.php. Media 1: Kaur, H. "Pesticide exposure during pregnancy may increase autism risk." CNN Chart Blog. Posted June 24, 2014. Accessible at http://thechart.blogs.cnn.com/2014/06/24/pesticide-exposure-during-pregnancy-may-increase-autism-risk/. Media 2: Broder, K. "Study Links Autism to Pesticides in Central Valley, Again." Posted June 25, 2014. AllGov California. Accessible at http://www.allgov.com/usa/ca/news/controversies/study-links-autism-to-pesticides-in-central-valley-again-140625?news=853501. Media 3: Goodman, B. "Pesticide Exposure in Pregnancy Tied to Autism Risk." HealthDay/WebMD. Posted on June 23, 2014. Accessible at http://www.webmd.com/baby/news/20140623/study-links-pesticide-exposure-during-pregnancy-to-autism-risk-in-kids#1.

		Assignment	Turn in Final Assignment, part III (20% of total points of Final Assignment), due at the end of this week. See “Final Assignment Instructions” on Canvas.
		Discussion	#5: Discuss with your group the assigned readings of <u>Case Study #7</u> , in particular, what you do and don’t understand, what confuses you, what you think the researchers meant, and why the results were interpreted the way they were. How do the media add/detract to our understanding of the study? What do you wish you knew or understood about the science, history of research, or the methodology to help you choose the interpretation that’s “correct”? <i>Bid each other farewell!</i>
12	Apr 9	Lectures	None.
		Readings	None.
		Assignment	Turn in Final Assignment, part IV (20% of total points of Final Assignment), due at the end of this week. See “Final Assignment Instructions” on Canvas.
		Discussion	None.
13	Apr 16	<i>Finals Week</i>	Turn in entire revised Final Assignment (20% of total points of Final Assignment) at the end of this week (April 22, 11:59pm EST). See “Final Assignment” instructions in the Assignments folder on Canvas. Please complete the course evaluation.