

Stats 98T

More Doctors Smoke Camels:

Statistics and Science Behind Public Health Research and Policy

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Meeting time: TR 3pm - 4:20pm
Location: Slichter 2834
Office Hours: TR 1pm - 2:30pm

Course website: <http://classes.stat.ucla.edu>

Course Overview:

In this class we will discuss complex issues in public health through the lens of statistical reasoning. We will critically read and discuss scientific articles on smoking, obesity, nutrition, physical activity and breast cancer screening, and use these discussions as a platform for introducing statistical concepts. We will consider multiple hypotheses about the causes and prevention of health problems related to these issues. We will show that the path between data and inference is not as clear-cut as it often appears in popular media.

The goals of this course are twofold: (1) to understand how the public opinion and public policy have changed over the years with regard to these topics, and (2) to develop a critical understanding of statistical concepts that can be applied to better understand controversies around these and other issues.

The objective of this class is not to teach students how live healthy, even though students may find valuable information in the articles and books that we will be reading. Instead, we will focus on critical reading of scientific articles and understanding the statistical reasoning that leads to the conclusions made in these papers. We will also consider statistics as a tool that can influence health policy development. We will look at cases where improper use of statistics has led to poor policies, and where sound use of statistics has contributed to the development of policies to improve health and well-being.

- Smoking:

We will start with examining smoking as a health concern. Even though the debate is settled with regard to the health hazards of smoking, this was not always the case. We will explore the medical history of smoking and some of the early research investigating its health hazards. We will also look at how public opinion and policy have changed over time, and how bad statistics and bad science were used to promote smoking in the 1950s. Lastly we will discuss the evidence behind smoking bans as a public health policy.

- Obesity:

We will start our discussion of obesity with research purporting to show that more deaths could be attributable to obesity than smoking. We will look at the history of obesity from being prized, indicating status and wealth in some cultures, to more modern standards where it is associated with a multitude of diseases and negative health outcomes. We will examine quantitative approaches to measuring obesity such as BMI and discuss their advantages and limitations.

We will review recent contradictory studies on obesity and in doing so we will learn about statistical topics such as confounding variables, blocking and interaction effects.

Since obesity is a hot topic, many of the articles we will be reading have drawn media attention. We will also read articles from the popular press reporting on these topics and discuss how accurately the research is reported in the press.

- Nutrition:

One way of dealing with obesity is changing the way we eat. In addition, elevated cancer risk has also been linked to nutrition. In this portion of the class we will look at public health policies that were put in place to ensure healthy nutrition, such as trans fat bans and food labeling.

- Physical activity:

In this section we will consider physical activity as a method to prevent obesity. The media often claims that we are getting lazier, we will examine if there has in fact been a significant change in physical activity levels in recent years.

- Breast cancer screening:

In November 2009, the U.S. Preventative Services Task Force updated their recommendation statement from 2002 on screening for breast cancer in the general population and they recommended against routine screening mammography in women aged 40-49 years. We will review the reasons behind this recommendation and in doing so we will learn about statistical topics such as conditional probability.

Required Texts:

There are two required books for this course both of which are available at the UCLA Book Store:

1. Course Reader (\$39)
2. How to lie with statistics (\$11.95). Huff, D. (1954). WW Norton & Co Inc.

Please make sure to bring readings with you to class. The length of reading assignments in terms of number of pages may not appear consistent. However the shorter readings involve reading scientific articles which will unavoidably go slower. In class we will discuss basic statistical literacy so that you can critically evaluate primary research even if all the statistical methods used in the papers are not covered in class. This is a skill that will be helpful not only for this class but also throughout your undergraduate studies.

From time to time in class we will read short newspaper articles that discuss the research papers or topics assigned for that week. These articles are intended to give you the context of the scientific articles and how the public perceives them and to promote class discussion. These articles are posted on Moodle and I will provide hard copies in class.

Policies:

Academic integrity: An important component of this class is writing. As with any other writing assignment, plagiarism is a serious concern. You must make sure to give credit for ideas that are not your own. We will talk about this issue in class and discuss proper techniques for citation. For further information please visit <http://www.library.ucla.edu/bruinsuccess> . Click on the “Citing and Documenting Sources” link. Take the quiz at the end of the tutorial and email your grade to me before the end of Week 2.

Communication: Outside the classroom, our primary tool of communication will be email. Please make sure to check your email at least once a week for updates and announcements.

Late assignments: No late assignments will be accepted without prior approval or a doctor’s note. If you know that you will not be in class, you are welcomed to email your assignment to me **before** the class begins. Assignments emailed later than that will be considered late and will not be accepted. If you will be emailing your assignment, please email it as an attachment in either Word or PDF formats.

Attendance: Attendance on its own is not a part of your grade break down but you have to be there to participate in the discussions and to complete the in class writing assignments (think of them like pop quizzes). Both of these will make up your participation / attendance grade, which is an important part of your grade breakdown.

In addition, you must make sure to be in class the day that you are presenting, so please plan accordingly. If you fail to show up the day you are supposed to be presenting you will not get a chance to make up your presentation and receive a zero on the assignment.

Grading:

Reading Journals	15%	Midterm Paper	20%
Discussion Questions	5 %	Midterm Presentation	10%
Group Presentation	10%	Final Paper	30%
Participation / Attendance	10%		

Reading journals (15%): Over the course of the quarter you are required to turn 7 journal entries (see Proposed Schedule for exact due dates) about the reading assignments from that week. Each week a set of questions on the reading will be posted on Moodle and your reading journal should consist of answers to these questions. Each journal entry should be typed with 12 pt. font, double spaced and 1 inch margins. You are asked to use a question answer format and keep your responses detailed but concise. You will be graded not only on content but also on writing and grammar. You will get feedback on your writing in these journals, which will prepare you for your midterm and final papers.

Discussion Questions (5%): At the beginning of each class you are asked to turn in a question you prepared about the reading(s) assigned for that day. The question may be on a single or multiple readings. These questions should be open ended in nature such that they will promote discussion in the class, which is exactly we what will be using them for.

Group Presentation (10%): The second class of each week will be devoted to presentations from students (except for Week 6 when we will have group presentations Tuesday and Thursday). With a partner, each of you will choose one class meeting to present the reading assigned for that week.

Below are guidelines you are encouraged to use as an outline for your presentation:

1. Background: Mention any previous research that was discussed in the article or book chapter at length or referred to often and discuss any key terms or concepts that may be unclear. A handout may be a useful tool if there is a lot of vocabulary or concepts that are confusing.
2. Quick Review of Paper or Chapter: Briefly summarize the general topics to refresh peoples minds to what the article or chapter covered, but don't talk about each and every detail. Go over confusing topics in the paper or chapter, and present any critiques you may have.
3. Discussion: Prepare a list of at least 5 questions to help stimulate discussion. You should also be prepared to answer any questions that the other students may have

for you.

Things to think about when working on your questions: What is the overall idea being presented? What is the question (hypothesis) being posed in the paper? Was the question answered? Is the methodology or argument sound? Do you agree with the authors conclusions? Does the study agree or disagree with articles and/or chapters we have discussed previously in class? How do the chapter(s) and/or paper(s) compare with each other?

The weekly presenters will lead the class through the article(s) and/or book chapter(s). Don't worry - I will be there to help you! The idea is to give a critical analysis of the reading material and promote class discussion; therefore, its not enough simply to recite the main points of the reading. In fact, you should aim to spend at most 20 minutes on the background and review of the reading and spend the rest of the time discussing it with the rest of the class. Good grades will be given to presentations that ask important questions and encourage debate and class participation.

Participation / Attendance (10%): Your participation grade will be based on willingness to participate and answer questions. It is especially important, and required, that you participate while other students are presenting.

In addition, from time to time I will give one open ended question about the reading for you to write a short paragraph about. This will help me keep track of attendance, to make sure you are doing the reading and give you a chance to get feedback on your writing.

Midterm Paper (20%): Your midterm paper will be a literature review of a public health topic. You can choose one of the topics we mention in class but you are not limited to those. Examples are "Obesity and diabetes", "Asthma and air pollution" or more current issues like "Swine flu" or "Mammograms and detecting breast cancer". You are asked to make an appointment with me during Week 4 to discuss the topic of your choice (why you chose it) and get approval, this will be an opportunity to get feedback as well as some guidance.

Your literature review should be chronological, presenting how this issue came about to be understood as a public health concern and what types of research have been done that argue for or against it.

At a minimum, you will need six references from the primary literature. Up to half of these references can come from the articles we read in class however the rest should be articles that you have found. For each reference your write up should include, but is not limited to:

- Main topic of the article

- Main hypothesis or question
- Line of reasoning of authors
- Statistical concepts mentioned in the article(it is sufficient to talk about the statistical concepts that we have mentioned in class)
- Major findings
- Context - why are we reading this article?

Instead of a question answer format, you should turn in a cohesive write up that touches all the points specified above. A good literature review not only summarizes each reference but also puts the papers in the context of the other readings through comparison.

The paper should be between 5-6 pages, typed with 12 pt. font, double spaced and 1 inch margins. You will be graded not only on content but also on writing and grammar. The paper is due at the beginning of Week 7.

Midterm Presentation (10%): You will also be asked to give a 10 minute presentation on the findings of your midterm paper, explaining clearly the methods you used to collect the research and the arguments for and against the claim you investigated. The emphasis of your midterm presentation should be the position you are planning to take on your final paper, and the evidence you have gathered for this position. This will give us a chance to hear your opinion on the issue and give you a chance to get valuable feedback from the class before you start working on your final paper.

Final Paper (30%): Building on your literature review from your midterm paper, you will write a position paper on public a health policy to mitigate this public health concern. Your paper should analyze not only the policy but also the scientific research that provided an impetus for this policy. Using the statistical and causal tools you learned in this class, present an argument for why you think this policy is necessary or unnecessary. You can also discuss whether or not you think the policy is effective, and how it can be improved.

This paper will be combined with your midterm paper for a final length of 10-12 pages, typed with 12 pt. font, double spaced and 1 inch margins. If you were not satisfied with your grade on your midterm paper, or would like to change your topic for any other reason, you can do so for your final paper. However this would mean that you would need to re-do your midterm paper, i.e. your literature review. Grading of the final paper will be based on the quality of the final paper (content, writing, grammar) as well as the improvement you have shown from the midterm paper. During Week 10 you are asked to make an appointment with me to discuss a preliminary draft of your paper.

Proposed Schedule:

	Lecture / Discussion Topic	Required Readings
Week 1		
March 30	<u>Introduction:</u> Overview of class expectations and requirements. How to find objective research resources and interpret academic literature. Overview of sampling and experimental design and a brief introduction to data sets used in many of the articles we will read.	
April 1	<u>Understanding statistics:</u> Understanding and interpreting survey outcomes, and how to interpret published statistics.	? (Chp 1-3)
Week 2		
April 3	<u>Smoking:</u> Medical history of cigarette smoking and early research on the health hazards of smoking. How do we infer causality?	? (Chp 4-5) ? (Chp 4)
April 8	<u>Smoking:</u> What are “confounding variables” and how do they affect causality? <i>Group 1 presentation & Reading journal 1 due.</i>	? (Chp 6-7) ? (Chp 5)
<i>Complete Bruin Success tutorial (http://www.library.ucla.edu/bruinsuccess) on “Citing and Documenting Sources” and email me your results before 8pm on April 11.</i>		
Week 3		
April 13	<u>Smoking:</u> Misuse of statistics in cigarette advertisements and how poor statistics can lead to misconceptions. How did the public finally find out about the dangers associated with smoking?	? (Chp 6) ?
April 15	<u>Obesity:</u> How many deaths in the US are attributable to smoking? Is obesity a bigger threat? Medical history and early research on the health hazards of obesity and an evolutionary approach to understanding our bulging waistline. <i>Group 2 presentation & Reading journal 2 due.</i>	? ? <i>In class: ?</i>

	Lecture / Discussion Topic	Required Readings
Week 4		
April 20	<u>Measuring obesity:</u> Body Mass Index (BMI), its strengths & weaknesses and alternative measures of obesity. How do we determine the most appropriate measure and what is the meaning of “statistical significance”?	? ? ?
April 22	<u>Measuring the dangers of obesity:</u> Why is it difficult to estimate the number of deaths attributable to obesity? Confounding variables revisited. <i>Group 3 presentation & Reading journal 3 due.</i>	? ? <i>In class: ?</i>
<i>Make an appointment with me during Week 4 to discuss your proposed research topic.</i>		
Week 5		
April 27	<u>Is it better to be overweight?</u> Controversy over a recent study claiming overweight people live longer. Discussion of confounding variables, blocking and interaction effects.	? ? ?
April 29	<u>Statistical bias:</u> Statistical bias may be the reason behind the controversial estimates of mortality attributable to obesity, or are scientists biased in their expectations? <i>Group 4 presentation & Reading journal 4 due.</i>	? (Chp 8-9) ?
Week 6		
May 4	<u>Interaction between smoking and obesity:</u> Smoking cessation is associated with weight gain, have smoking bans increase the prevalence of obesity? Can the interaction between smoking and obesity affect the estimates of mortality attributable to obesity.	? ?
May 6	<u>Childhood obesity:</u> Scope of the childhood obesity problem and developments in its establishment of cause, prevention, and treatment. Is parental obesity or sugar-sweetened drinks “causing” childhood obesity. Discussion of observational studies vs. controlled experiments. <i>Group 5 presentation & Reading journal 5 due.</i>	? ? ?

	Lecture / Discussion Topic	Required Readings
Week 7		
May 11	Midterm Presentations and Discussion <i>Midterm paper due.</i>	<i>No readings this week; instead, use the time to prepare your presentations.</i>
May 13	Midterm Presentations and Discussion	
Week 8		
May 18	<u>Nutrition:</u> What changed in the last decade to bring on obesity to “epidemic” levels?	? ? (Chp 10)
May 20	<u>Public Health Policy:</u> FDA regulations on food labelling. Law as a tool to facilitate healthier lifestyles and prevent obesity. <i>Group 6 presentation & Reading journal 6 due.</i>	? ?
Week 9		
May 25	<u>Breast cancer screening:</u> New recommendations for breast cancer screening	? ? ? ?
May 27	<u>Media coverage</u> Media coverage of the revised recommendations for breast cancer screening - clarification or confusion? <i>Group 7 presentation & Reading journal 7 due.</i>	? ? ? ?
Week 10		
June 1	Final paper guidelines & workshop, class evaluations, questions/concerns	<i>No readings this week; instead, use the time to keep working on your final paper.</i>
June 3	<u>More advanced statistics in public health research</u> <u>Presentation on Small Area Estimation:</u> Exploring the relationship between air pollution exposure during pregnancy and early childhood respiratory health problems.	
<i>Make an appointment with me during Week 10 to discuss a preliminary draft of your final paper.</i>		
Finals Week		
June 10	<i>Final paper due by 3pm on Thursday, June 10.</i>	

Reading List: