

**Homework policies**

Homework is due at the **beginning** of class on the due date. Late homework will not be accepted, with one exception: you may hand in *one* assignment late (by 12:00 noon on the next school day) *once* during the semester. If you are planning to hand in a homework late, *email me* by the beginning of class on the original due date.

This assignment should be **typed** (i.e., on a word processor).

Note: PDF copies of the papers below can be found in the Classes folder, and paper copies on reserve at Cornell Library.

**1.** Read the summary of the following paper:

DA Redelmeier and RJ Tibshirani (1997): Association between cellular-telephone calls and motor vehicle collisions. *New England Journal of Medicine*, vol. 336, no. 7, pp. 453–458.

In one or two sentences, summarize the authors' findings on the risks of using a cell phone while driving.

**2.** Read the following web page:

[http://www.drivenowtalklater.org/Dont\\_Drive\\_And\\_Talk.html](http://www.drivenowtalklater.org/Dont_Drive_And_Talk.html)

This page claims that for drivers on phones “Their risk of causing a crash **increases by 400%**” [emphasis retained from original]. Is this claim supported by the summary in the *New England Journal of Medicine* (*NEJM*)? Why or why not?

**3.** Read the following article by the authors of the *NEJM* article, which gives details about the authors' methodology:

DA Redelmeier and RJ Tibshirani (1997): Is using a car phone like driving drunk?  
*Chance*, vol. 10, no. 2, pp. 5–9.

**4.** Was this an observational study or a designed experiment? Explain. If there were no ethical concerns, briefly describe how you could conduct an experiment that would determine whether using a cell phone *causes* accidents.

**5.** Suppose the authors had simply surveyed (A) 100 people who report using their cell phone while driving, and (B) 100 others who report not using their cell phone while driving, and then compared the rate of accidents for groups A and B. What lurking variables or problems might exist with such a study?

**6.** (omit this question)

**[over]**

**7.** Regarding another study carried out in 1985, the authors write, “This study of 305 individuals found a significantly lower collision rate in the year following the purchase of a cellular telephone (8.2% vs. 6.6%).” Was this an observational study or a designed experiment? The authors describe the study’s methodology as a before-and-after study, which is another form of matching. What are the units being matched in this before-and-after study? Why were the authors “worried” about the results of this survey?

**8.** The authors mention some experiments (which they refer to as “randomized trial[s]”) that they found in the literature. Why do they not place much stock in these experiments?

**9.** The authors describe their own study as a “case-crossover” design, which is a form of matching. Briefly summarize how the study was carried out. What are the units being matched in this case-crossover study?

**10.** According to Figure 2, what percentage of subjects were using a cell phone during the hazard interval (the time in which the accident occurred)? What percentage of subjects were using a cell phone during the control interval (the same time on the previous day)?

**11.** A critic could argue that the authors’ methodology was flawed due to their comparison of the day of the accident to the previous day. Perhaps people are more likely to get into accidents on a Monday, when they are stressed out about returning to work. People might also be more likely to use a cell phone on Monday, also as a result of being back at work. If we compare accidents on Mondays to control intervals on Sunday, the effect of being at work may be a lurking variable. How do the authors counter such objections?

**12.** It was widely reported in the media that using a cell phone while driving is as dangerous as drunk driving. For example, see the section under “Driver Impairment” near the bottom of this web page:

<http://BicycleUniverse.info/cars/criticism.html>

Do the authors believe this comparison is accurate? Why do you think the authors made the comparison (albeit in a more limited form) in their *NEJM* article?

**13.** Do the authors believe that their results call for a ban on using cell phones while driving? What do the authors believe the role of scientific knowledge should be in public policy decisions?