

STAT 343
Sample Survey Theory and Applications
Instructor: Debaraj Sen
Due Date: January 27, 2015

Assignment#1

1. Many scholars and policy makers are interested in the proportion of homeless people who are mentally ill. Wright (1988) estimates that 33% of all homeless people are mentally ill, by sampling homeless persons who received medical attention from one of the clinics in the Health Care for the Homeless (HCH) project. He argues that selection bias is not a serious problem because the clinics were easily accessible to the homeless and because the demographic profiles of HCH clients were close to those of the general homeless population in each city in the sample. Do you agree? Describe the target population, sampling frame, sampling unit, and observation unit. Discuss any possible sources of selection bias or inaccuracy of responses.

2. Readers of the magazine Popular Science (August 1990) were asked to phone in (on a 900 number) their responses to the following question: "Should the USA build more fossil-fuel generating plants or the new so-called safe nuclear generators to meet the energy crisis of the 90s?" Of the total call-ins, 86% chose the nuclear option. What do you think about the way the poll was conducted? What do you think about the way the question was worded? Do you think the results are a good estimate of the prevailing mood of the country?

3. In which of the following situations can you reasonably generalize from the sample to the population?

- a) You use your statistics class to get an estimate of the percentage of students in your school who study at least two hours a night.
- b) You use the average annual income of the ambassadors to the United Nations to get an estimate of average per-capita income for the world as a whole.
- c) In 1996, a Gallup poll sampled 235 U.S. residents ages 18 to 29, to estimate the percentage of all U. S. residents ages 18 to 29 who favored cuts in social spending.

4. Discuss the relative merits of using personal interviews, telephone interviews, and mailed questionnaires as methods of data collection for each of the following situations:

- a) A television executive wants to estimate the proportion of viewers in the country who are watching her network at a certain hour.
- b) A newspaper editor wants to survey the attitudes of the public toward the type of news coverage offered by his paper.
- c) A country health department wants to estimate the proportion of dogs that have had rabies shots within the last year.
- d) A city commissioner is interested in determining how homeowners feel about a proposed zoning change.

5. The teenage attitude and practice survey obtained completed questionnaires, either by telephone, or by mail, from a randomly selected group of 9965 respondents between the age of 12 and 18 living in households across the country. One type of question asked the teenagers being interviewed about the perceived behavior of their peers. The teenagers answering the questions are classified as: NS-Never smoked; EX-experimenter with smoking; FS- Former smoker; CS-Current smoker. “Do your peers care about staying away from marijuana?” The population projected frequencies (in thousands) calculated from the sample from the sample responses are as shown below.

Care about keeping weight down

	NS	EX	FS	CS
A lot	7213	2693	75	857
Somewhat	2482	1861	109	1102
A little	744	542	27	298
Don't care	1878	1550	119	1312

- a. What proportion of those who never smoked thinks their peers care a lot about staying away from marijuana?
- b. What proportion of the current smokers thinks their peers care a lot about staying away from marijuana?
- c. Among those who think their peers care about staying away from marijuana, what proportion has never smoked?
- d. Do you thing perceived peer attitude toward staying away from marijuana are associated with the smoking status of the teenager? What proportions help justify your answer?