

Stat 257: Assignment #6
Due: Monday, November 28, 2005

Problem 1. (modified version of #7.1, page 205)

A survey is to be conducted to estimate characteristics of a population which contains a small proportion of members with a rare condition. Members know whether or not they have the condition, the presence of which can be detected from blood sample analysis, and support groups exist to advise and inform affected individuals. By reference to an example of a condition of this sort, discuss the practicability, and relative advantages and disadvantages, of

- randomised response methods (Section 6.4.2),
- snowballing.

Problem 2. A study is designed to estimate the proportion of people in Saskatchewan who give false information on their federal tax returns. Since respondents would be unlikely to admit to cheating, a random response technique is used. The experimenter constructs a deck of cards in which $3/4$ of the cards are marked **F**, denoting a falsified return, and $1/4$ are marked **C**, denoting a correct return. A simple random sample of $n = 400$ Saskatchewan tax payers is held. In separate interviews, each sampled tax payer is asked to draw a card from the deck and to respond yes if the letter agrees with the group to which he or she belongs. The experiment results in 120 responses of yes. Construct an approximate 95% confidence interval to estimate p , the proportion of Saskatchewan tax payers who have falsified returns.