

An online poll at a Web site asked:

A nationwide ban of the diet supplement ephedra went into effect recently. The herbal stimulant has been linked to 155 deaths and many more heart attacks and strokes. Ephedra manufacturer NVE Pharmaceuticals, claiming that the FDA lacked proof that ephedra is dangerous if used as directed, was denied a temporary restraining order on the ban yesterday by a federal judge. Do you think that ephedra should continue to be banned nationwide?

65% of 17,303 respondents said “yes.” Comment on each of the following statements about this poll:

- With a sample size that large, we can be pretty certain we know the true proportion of Americans who think ephedra should be banned.
- The wording of the question is clearly very biased.
- The sampling frame is all Internet users.
- Results of this voluntary response survey cannot be reliably generalized to any population of interest.

At its Web site (www.gallupworldpoll.com) the Gallup World Poll describes their methods. After one report they explained: *Results are based on face-to-face interviews with randomly selected national samples of approximately 1,000 adults, aged 15 and older, who live permanently in each of the 21 sub-Saharan African nations surveyed. Those countries include Angola (areas where land mines might be expected were excluded), Benin, Botswana, Burkin Faso, Cameroon, Ethiopia, Ghana, Kenya, Madagascar (areas where interviewers had to walk more than 20 kilometers from a road were excluded), Mali, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda (the area of activity of the Lord’s Resistance Army was excluded from the survey), Zambia, and Zimbabwe.... In all countries except Angola, Madagascar, and Uganda, the sample is representative of the entire population.*

- Gallup is interested in sub-Saharan Africa. What kind of survey design are they using?
- Some of the countries surveyed have large populations. (Nigeria is estimated to have about 130 million people) Some are quite small. (Togo’s population is estimated at 5.4 million) Nonetheless, Gallup sampled 1000 adults in each country. How does this affect the precision of its estimates for these countries?

When spending large amounts to purchase advertising time, companies want to know what audience they’ll reach. In January 2007, a poll asked 1008 American adults whether they planned to watch the upcoming Super Bowl. Men and women were asked separately whether they were looking forward more to the football game or to watching the commercials. Among the men, 16% were planning to watch and were looking forward primarily to the commercials. Among women, 30% were looking forward primarily to the commercials.

- Was this a stratified sample or a blocked experiment? Explain.
- Was the design of the study appropriate for the advertisers’ questions?

A consumer group wants to test the effectiveness of a new “organic” laundry detergent and make recommendations to customers about how to best use the product. They intentionally get grass stains on 30 white T-shirts in order to see how well the detergent will clean them. They want to try the detergent in cold water and in hot water on both the “regular” and “delicates” wash cycles. Design an appropriate experiment, indicating the number of factors, levels, and treatments. Explain the role of randomization in your experiment.

A humor piece published in the *British Medical Journal* (“Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomized control trials,” Gordon, Smith, and Pell, *BMJ*, 2003:237) notes that we cannot tell for sure whether parachutes are safe and effective because there has never been a properly randomized, double-blind, placebo-controlled study of parachute effectiveness in skydiving. Suppose you were designing such a study:

- What is the factor in this experiment?
- What experimental units would you propose?
- What would serve as a placebo for this study?
- What would the treatments be?
- What would the response variable be?
- What sources of variability would you control?
- How would you “randomize” this experiment?
- How would you make the experiment double-blind?