

## Biased Samples

STAT-UB.0103 – Statistics for Business Control and Regression Models

### Populations and Bias

Each of the following scenarios involves collecting data to learn about a population. State (a) what population is involved, and (b) why the sample is biased. To demonstrate that a sample is biased, you must argue that certain members of the population are more or less likely to be sampled than others. Note: there will usually be many valid answers for parts (a) and (b), but your answer to part (b) will depend on how you define the population in part (a).

1. You need a survey on household spending patterns. You take a random sample from the customer list of the local brokerage firm.
2. You want to learn about New York City residents' sentiments (positive or negative) towards their new mayor, Bill de Blasio. You search for "de Blasio" on Twitter and read the first 100 relevant search results.
3. You need to know the opinions of Stern students with regard to some curriculum matters. You ask some of the people in your class.
4. You want to learn about the quality of the food at a local restaurant. You read the reviews for the restaurant on Yelp.com.
5. You want to estimate the rate of growth of stocks over the last fifty years. You take a random sample of the stocks listed today on either the New York Stock Exchange or the Nasdaq. Some of these stocks did not exist fifty years ago; you set these aside. For the other stocks, you identify their prices fifty years ago, and you use this to compute the growth rate.

6. You want to know information about consumer preferences on a number of household products, including soap, laundry detergents, dishwashing detergents, furniture polish, and cleanser. You devise a questionnaire item with 50 questions; this takes ten to fifteen minutes to administer over the phone. You randomly select phone numbers, and you get the responses of those who are home and willing to help you.
  
7. You want to know whether a certain teaching method improves the reading abilities of fourth-grade students. You examine all the articles on this subject published in five major education journals in the last ten years.
  
8. You want to learn about lifestyle habits which lead to kidney cancer. You take a random sample of patients from the list of an oncology practice, and you interview these people with regard to issues like diet, cigarette smoking, chemical exposure, and so on.
  
9. You want to get information about some mutual funds, so you research every fund which was advertised in the last four issues of a financial newsletter.
  
10. You want to learn opinions among parents in your school district regarding adult literacy education. You send out a letter inviting all parents inviting them to attend an information session.