2. Simple Random Method: without a replacement when p is known

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

Where
n = optimum sample size
N = population size
p = proportion of those who say “Yes”
q = (1-p) = those who say “No”
z = a reliability coefficient
d = precision rate or error rate

- There are 3200 students in a university. A researcher gave a questionnaire to 35 of them as a pilot test and found that 60% of them like Web-Based Instruction. With a reliability of 99% and sampling error not more than 5%, how large a sample size should the researcher use in his/her main study?

Reliability of 95%, z = 1.960 or roughly = 2.0 and that of 99%, z = 2.576 or 3.0.

An Example

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

Where

- n = optimum sample size
- N = 3200
- p = 0.60
- q = (1-p) = 0.40
- z = 3
- d = 0.05

$$n = \frac{3200 * 3^2 * 0.60 * 0.40}{3200 * (0.05)^2 + 3^2 * 0.60 * 0.40}$$

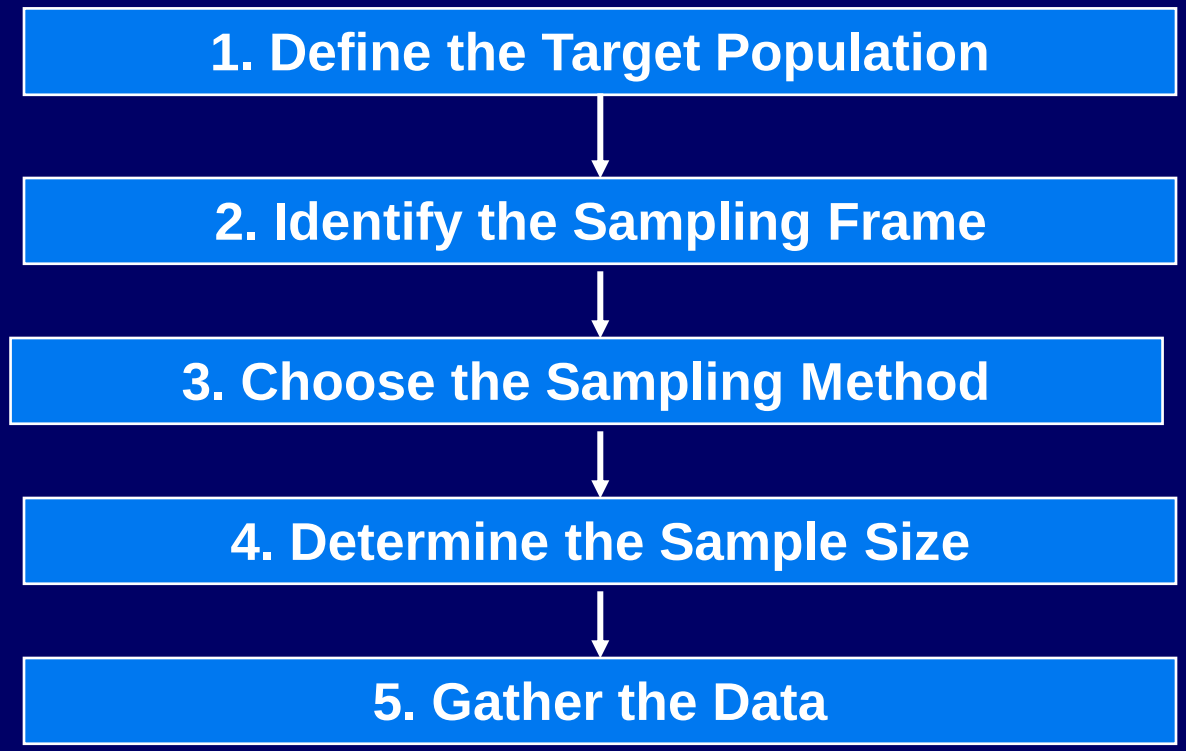
$$n = 680$$

- There are 3200 students in a university. A researcher gave a questionnaire to 35 of them as a pilot test and found that 60% of them like Web-Based Instruction. With a reliability of 99% and sampling error not more than 5%, how large a sample size should the researcher use in his/her main study?

Decision Time!

- Let's say that your school consists of only 2,500 first year students learning Foundation English. As a researcher, you want to conduct a survey study to find out if they like Collaborative Learning or not.
- Would you go ahead and sample everybody in the population, or use a sample size formula to calculate the number of students to sample, or use a ready-made sampling table, given a certain margin of error? Give your reasons.
- What factors should you consider when making this important decision?

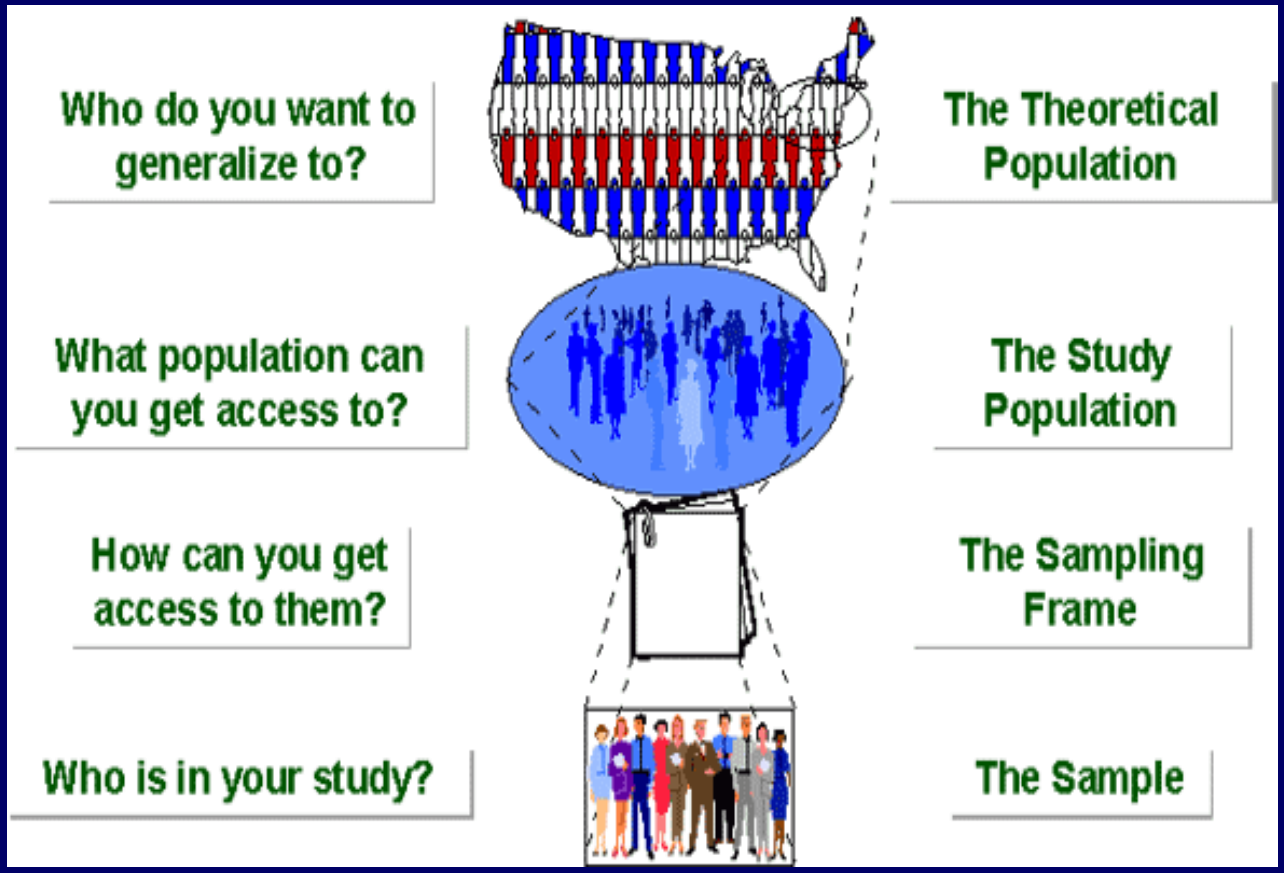
The Sampling Process



Identify the Sampling Frame

- ***Sampling Frame:*** Actual list of each element or member of the target population.
- Sampling Biases
  - ***Nonresponse Bias:*** (or nonresponse error) Occurs when a high percentage of respondents choose not to participate in the study.
    - Noncooperation
    - Noncontact
    - Passive Refusal
  - ***Inaccurate Sampling Methods:*** An inaccurate sampling frame happens when, for example, samples for surveying a firm's customers are based on a list provided by the firm. The list may be a list of accounts rather than a list of customers. This would result in a customer with three accounts having a triple probability of being drawn into a sample.
  - To reduce the chance of sampling bias and to allow for statistical analysis, a random sample should be taken.

Technical Sampling Terms



http://www.socialresearchmethods.net/kb/sampterm.php

Technical Sampling Terms

Variable

response

1 2 3 (4) 5

Statistic

sample

Average = 3.75

Parameter

population

Average = 3.72

Points to consider when sampling

1. Sampling should not be **biased**:

- Example of a biased sample
  - Select only individuals from a classroom for English proficiency study.

2. The selection of an individual in the population should not affect the selection of the next individual – **independence**.

- Example of non-independent sample
  - Draw a name of a student from a box and do not put it back.

3. Sampling should be large enough to adequately cover the population.

- Example of a small sample
  - Suppose only 5 out of 500 students were used in how high achievers learn English.

4. Samples/subjects should be good representatives of the population.