7.1 Sampling Plans

Sampling plan: How to select a sample from a population.

We want samples to be representative of the population. (Samples should look like the population).

See handout on website.

SAMPLING METHODS

1) SIMPLE RANDOM SAMPLE: Every measurement in the population has equal probability of being chosen.

Ex: To form a random student committee, assign each student a number and use a calculator's random number generator to select students.

2) STRATIFIED RANDOM SAMPLE: The population is divided into subpopulations, then a random sample is selected from each subpopulation.

Ex: Victoria residents are divided into different age groups and people are randomly chosen from each age group.
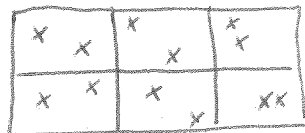
3) CLUSTER SAMPLE: Divide the population into clusters and take a random sample of the clusters. ALL measurements in the chosen clusters are included in the sample.

Ex: To form a sample of buildings in Victoria, let the city blocks represent the clusters. Take a random sample of the city blocks; all buildings in the chosen blocks are included in the sample.
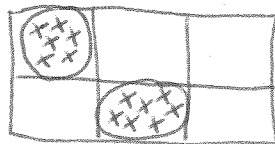
4) 1-in-k SYSTEMATIC RANDOM SAMPLE: Randomly select one of the first k measurements in the population and then every k-th measurement.

Ex: Ball bearings #3,23,43,63,... from a production line form a 1-in-20 systematic sample.

Ex: Identify the sampling method:

a) A lightbulb company makes 60W and 100W bulbs. A random sample of the 60W bulbs is selected, and a random sample of the 100W bulbs is selected.

Stratified

b) Engineers in a large city want to perform a random check on red-light cameras in 85 different neighbourhoods. A random sample of 10 neighbourhoods is selected and every red-light camera in the chosen neighbourhoods is inspected.

Cluster

c) A random number generator is used to select 12 of 100 shipments for quality-control testing.

Simple

d) Starting with the 11th part, every 25th part coming off the production line is selected for further inspection.

1-in-25 Systematic