**MATH221, Week 1**

Sampling Strategies

Introduction

Sampling strategies refer to the method by which a sample is selected from a population. The goal of sampling is to select things or people so that the sample is representative of the population. The sampling strategies outlined here are random, cluster, stratified, systematic, and convenience.

Random

A random sample is similar to closing one’s eyes and just selecting the sample. There is an equal change of picking one sample of 5 out of a population, as there is of picking any other sample of 5 from that same population.

Cluster

To make a cluster sample one must divide the population into groups based on shared geographic location such as zip code or hospital.   Then a few sections are randomly selected.  Everything or person in the selected sections is then included in the sample.  This is how crowd estimates are done. An aerial photo is taken and a grid is overlaid on that photo. Several boxes in that grid are randomly selected and researchers count how many people are in the selected grids. Then the average of the selected grids is multiplied by the total number of grids to get the estimate. A cluster sample can be envisioned like this:

Stratified

To make a stratified sample one must divide the population into groups based on demographics or descriptors of the population such as age, ethnicity, salary, etc.   The groups/strata that are created for the sample must match the demographic breakdown for the entire population.  For example, imagine a polling person wants to sort people’s political opinions by ethnicity and needs a sample of 100.   If 61% of the entire population is white, non-Hispanic, then 61 members of the sample of 100 would need to be white, non-Hispanic.  The members of each group/strata would be randomly chosen.

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Systematic

In systematic sampling, there is a system to how the sample is selected. The population is ordered in some way, and a starting point is randomly selected. Then items are chosen at regular intervals, say, every fifth person might be selected. In another example, every 15th item might be selected for the sample. This is often how quality control is done in manufacturing.

Convenience

Convenience sampling rarely ends up being representative of the population. This is where the things or people that are most convenient to sample, are included in the sample. For example, if someone asked all their friends in class how much time they spent studying, that would be a convenience sampling of students.

Census

A census is not a sample, but is when everyone or everything in the population is included in the study. The US conducts a census once every ten years in order to determine congressional districts, as well as to gather valuable information about the US population.