

Sampling Methods

Gathering statistics involves time and effort. It is a necessary procedure – governments need to know how many schools to build, or policemen to employ, and companies need to know which products people will buy. They could go out and ask everyone, but this would mean a lot of time and effort needed to be spent, much of it unnecessary.

Instead of asking everyone, we could carry out a survey. This involves selecting a number of individuals that are representative of the population. The process of picking which individuals to sample is called 'sampling'. There are four different types of sampling.

1. Random – individuals are selected at random. In practice it can be difficult to find a random sample. If you randomly ask people shopping for example, you will probably be asking mostly women, because MEN HATE SHOPPING!
2. Systematic – Gather a random selection then select every 10th or 20th individual from that selection to sample. Obviously this is not a truly random sample. The selection will have to be ordered in some way. If they are ordered with respect to height for example, with 99 people, then the last, tallest person will have no chance of being selected.
3. Stratified – If the population falls into several different groups, choose some of the groups to sample from, then pick a random selection from those groups. This will mean that some groups are not represented in the sample.
4. Quota – If the population to be sampled consists of distinct groups, then individuals are picked from each group to reflect the proportion they have in the population. In practice it may be difficult to fill each quota. If you are seeking to asking men and women which holiday they would prefer according to the proportion they represent in the population, it will probably be hard to obtain enough answers from men because they tend to be busier, and they may not care at all where they go on holiday (beer tastes the same everywhere).

Quota sampling is probably the most used method. Suppose a sample of 50 is to be taken from a population consisting of the following groups and numbers.

Group	Frequency
Men	25
Women	54
Boys	76
Girls	69

There are $25+54+76+69=224$ individuals.

The number of men to be sampled is $\frac{25}{224} * 50 = 5.58 \approx 6$

The number of women to be sampled is $\frac{54}{224} * 50 = \cancel{6} 12.05 \simeq 12$

The number of boys to be sampled is $\frac{76}{224} * 50 = \cancel{6} 16.96 \simeq 17$

The number of girls to be sampled is $\frac{69}{224} * 50 = \cancel{6} 15.4 \simeq 15$

Check $6+12+17+50=50$.