

# Random sampling techniques

[Science](#), [Statistics](#)



There are many ways to select a random sample. Four of them are discussed below: Simple Random Sampling: In this sampling technique, each sample of the same size has the same probability of being selected. Such a sample is called a simple random sample. One way to select a simple random sample is by a lottery or drawing. For example, if we need to select 5 students from a class of 50, we write each of the 50 names on a separate piece of paper. Then, we place all 50 names in a hat and mix them thoroughly.

Next, we draw 1 name randomly from the hat. We repeat this experiment four more times. The 5 drawn names make up a simple random sample. The second procedure to select a simple random sample is to use a table of random numbers, which has become an outdated procedure. In this age of technology, it is much easier to use a statistical package, such as Minitab, to select a simple random sample. Systematic Random Sampling: The simple random sampling procedure becomes very tedious if the size of the population is large.

For example, if we need to select 150 households from a list of 45, 000, it is very time consuming either to write the 45, 000 names on pieces of paper or then select 150 households or to use a table of random numbers. In such cases, it is more convenient to use systematic random sampling. Stratified Random Sampling: Suppose we need to select a sample from the population of a city, and we want households with different income levels to be proportionately represented in the sample.

In this case, instead of selecting a simple random sample or a systematic random sample, we may prefer to apply a different technique. First, we divide the whole population into different groups based on income levels.

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Thus, whenever we observe that a population differs widely in the possession of a characteristic, we may prefer to divide it into different strata and then select one sample from each stratum. We can divide the population on the basis of any characteristic, such as income, expenditure, sex, education, race, employment, or family size.

**Cluster Sampling:** Sometimes the target population is scattered over a wide geographical area. Consequently, if a simple random sample is selected, it may be costly to contact each member of the sample. In such a case, we divide the population into different geographical groups or clusters and as a first step select a random sample of certain clusters from all clusters. We then take a random sample of certain elements from each selected cluster. For example, suppose we are to conduct a survey of households in the state of New York. First, we divide the whole state of New York into, say, 40 regions, which are called clusters or primary units. We make sure that all clusters are similar and, hence, representative of the population. We then select at random, say, 5 clusters from 40. Next, we randomly select certain households from each of these 5 clusters and conduct a survey of these selected households. This is called cluster sampling. Note that all clusters must be representative of the population.