



## Systematic Sampling

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Systematic sampling is a random sampling technique which is frequently chosen by researchers for its simplicity and its periodic quality.

In systematic random sampling, the researcher first randomly picks the first item or subject from the population. Then, the researcher will select each  $n$ 'th subject from the list.

The procedure involved in systematic random sampling is very easy and can be done manually. The results are representative of the population unless certain characteristics of the population are repeated for every  $n$ 'th individual, which is highly unlikely.

The process of obtaining the systematic sample is much like an arithmetic progression.

- 1. Starting number:**

The researcher selects an integer that must be less than the total number of individuals in the population. This integer will correspond to the first subject.

- 2. Interval:**

The researcher picks another integer which will serve as the constant difference between any two consecutive numbers in the progression.

The integer is typically selected so that the researcher obtains the correct sample size

For example, the researcher has a population total of 100 individuals and need 12 subjects. He first picks his starting number, 5.

Then the researcher picks his interval, 8. The members of his sample will be individuals 5, 13, 21, 29, 37, 45, 53, 61, 69, 77, 85, 93.

Other researchers use a modified systematic random sampling technique wherein they first identify the needed sample size. Then, they divide the total number of the population with the sample size to obtain the sampling fraction. The sampling fraction is then used as the constant difference between subjects.

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## Advantages of Systematic Sampling

- The main advantage of using systematic sampling over simple random sampling [1] is its simplicity. It allows the researcher to add a degree of system or process into the random selection of subjects.
- Another advantage of systematic random sampling over simple random sampling is the assurance that the population will be evenly sampled. There exists a chance in simple random sampling that allows a clustered selection [2] of subjects. This is systematically eliminated in systematic sampling.

## Disadvantage of Systematic Sampling

- The process of selection can interact with a hidden periodic trait within the population. If the sampling technique coincides with the periodicity of the trait, the sampling technique will no longer be random and representativeness of the sample is compromised.

## Notes

- Since systematic random sampling is a type of probability sampling [3], the researcher must ensure that all the members of the population have equal chances of being selected as the starting point or the initial subject.
- The researcher must be certain that the chosen constant interval between subjects do not reflect a certain pattern of traits present in the population. If a pattern in the population exists and it coincides with the interval set by the researcher, randomness of the sampling technique is compromised.

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**Source URL:** <https://explorable.com/systematic-sampling>

### Links

[1] <https://explorable.com/simple-random-sampling>

[2] <https://explorable.com/cluster-sampling>

[3] <https://explorable.com/probability-sampling>