

Multi-Stage Sampling

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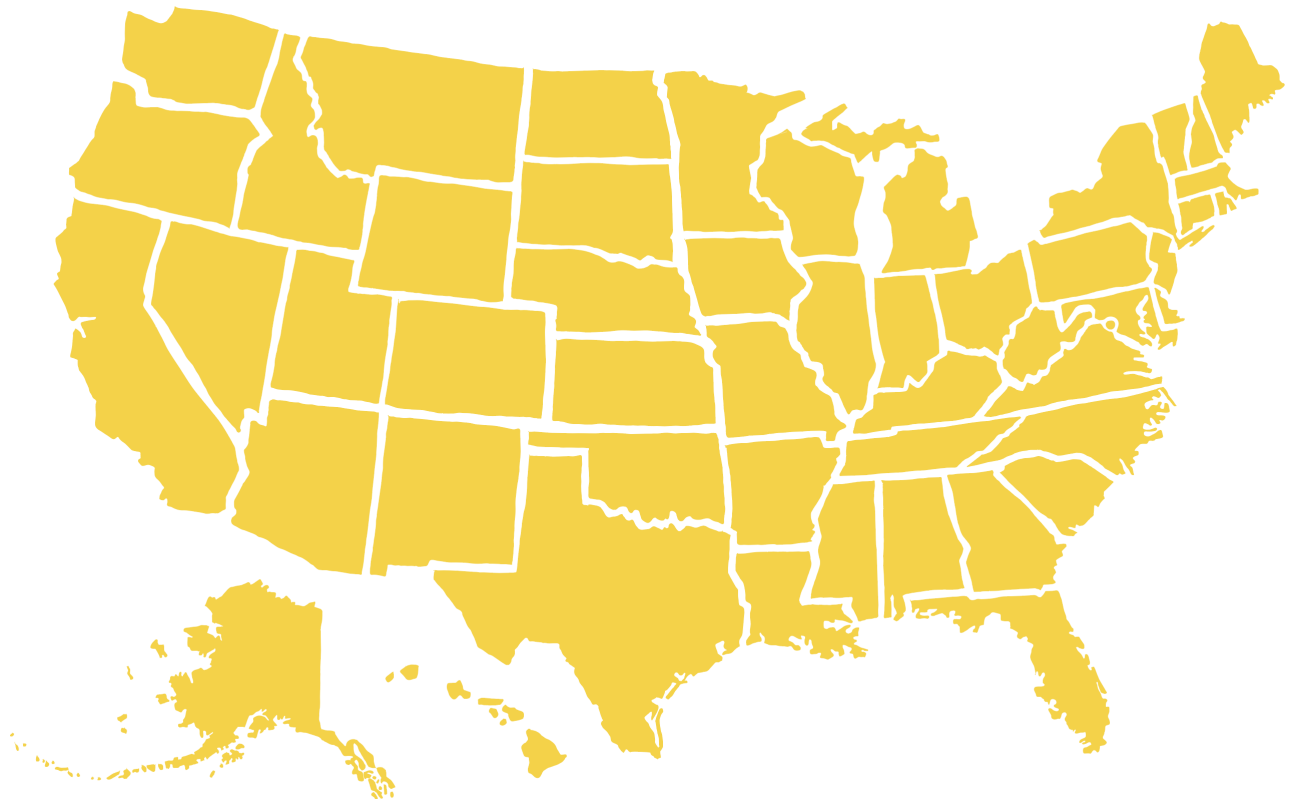
WHAT'S COVERED

This tutorial will introduce multi-stage sampling, focusing specifically on:

1. [Comparing Sampling Methods](#)
2. [Multi-Stage Sampling](#)

1. Comparing Sampling Methods

Suppose that you wanted to sample from the entire United States as a whole.



Can you perform a simple random sample (SRS)?

You'd have to somehow account for every person in the United States, and maybe assign them a number, and pull numbers out of a hat, or use some kind of random sampling procedure. This would be too difficult to assign to everyone.

Can you perform a stratified random sample?

Strata, in this case, are still too big. You might take a few people from Maine, and a few people from Minnesota, and a few people from North Dakota, etc., and it would still be too large. Plus, it really wouldn't be cost effective, commuting to all these different places.

Can you perform a cluster sample of states?

If you identified states as clusters, you would randomly select some of the clusters and then sample everyone within that cluster. You'd be sampling entire states. For example, everyone in North Carolina would be in the sample if you select that state as a cluster, which simply isn't feasible.

Therefore, none of those really make any sense. The way out of the box here is a multi-stage design.

2. Multi-Stage Sampling

Multi-stage sampling is a common sampling procedure utilized when the population is very, very large. With multi-stage sampling, you continue zooming in from larger areas to smaller and smaller areas until you can find a small enough sample of the people you need.

To perform a multi-stage sampling, first select clusters, then take a simple random sample from each cluster.

Let's take a look at an example:



Step 1: States

When sampling the United States as a whole, states make the most sense as clusters because of geographic simplicity. It's not realistic or feasible to sample everyone within a state, so randomly select just five states: California, Tennessee, Minnesota, Massachusetts, and Oklahoma. Pick one state and start the process.

Step 2: Counties

It is equally unrealistic to sample everyone in Minnesota, so you can narrow your sample by randomly select counties. Perhaps you select Carver County, Marshall County, and maybe a few other counties. If that's a

small enough basis for you to get everyone within the county, then you can stop.

Step 3: Towns

If you need yet a smaller sample size, you can choose just one county, like Carver County, and sample towns within that county. Perhaps you randomly select three of those towns: Chanhassen, Waconia, and Chaska. If those are small enough units, then you can stop.

Step 4: Neighborhoods

However, if the sample size is still too large, you can continue to narrow it down. Within Chaska, for example, you can sample some neighborhoods. Typically by the time you get to neighborhoods within a town, it's easy enough to walk around the neighborhood and get almost everybody within that neighborhood.

Now you can move onto the next cluster where you would repeat this process with the remaining four states.



TERM TO KNOW

Multi-Stage Sampling

A sampling design which combines elements of cluster sampling, stratified random sampling, and simple random sampling. It "zooms in" on smaller areas to sample so that sampling becomes more feasible.



SUMMARY

Multi-stage sampling is used when the population is so big and the groups, strata or clusters so large that it makes more sense to zoom in and take small groups. You begin with certain clusters, and then you sample within those clusters instead of taking the full cluster. Therefore, multi-stage sampling combines *elements* of cluster sampling, stratified designs, and simple random designs, which were contrasted within this tutorial, though you may recall, none of these were feasible when attempting the sample of the United States.

Good luck!

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