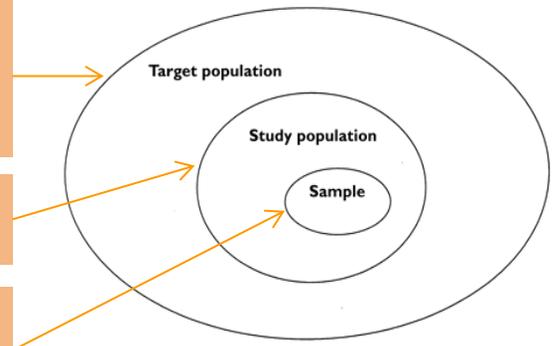


Conventional science distinguishes three groups of individuals. **Target population** is population of ultimate clinical interest. But, because of practicalities, entire target population often cannot be studied.

Study population is subset of target population that can be studied.

Samples are subsets of study populations used in clinical research because often not every member of study population can be measured.

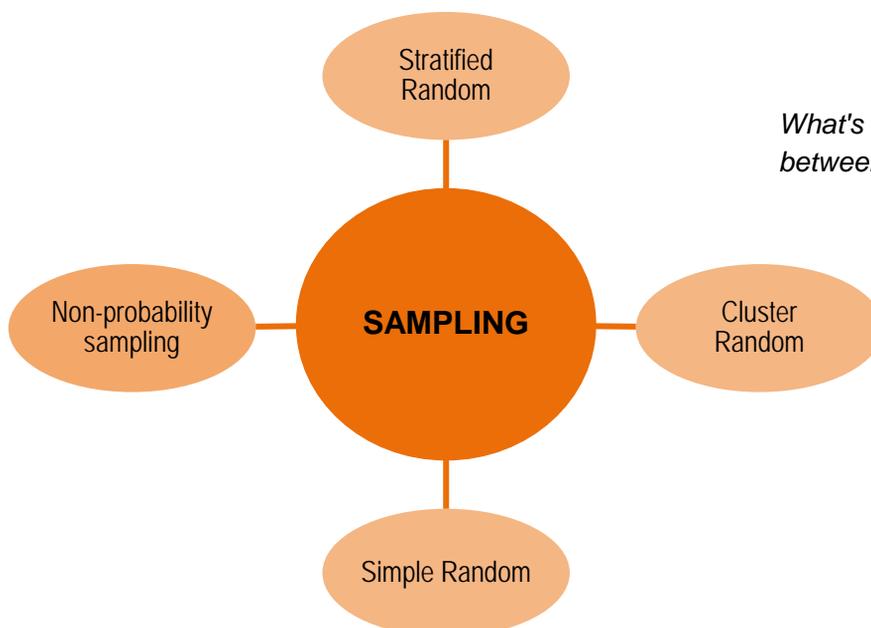


Example

A proposal before a state's legislature would increase the petrol prices. The additional funds would be used to improve the state's roads. Some state legislators are concerned about how the voters view this proposal. To gain this information, a pollster randomly selects 1,009 registered voters in the state and asks each whether or not he/she favours the additional tax for the designated purpose. Identify the “*population*” and “*sample*” in this example?

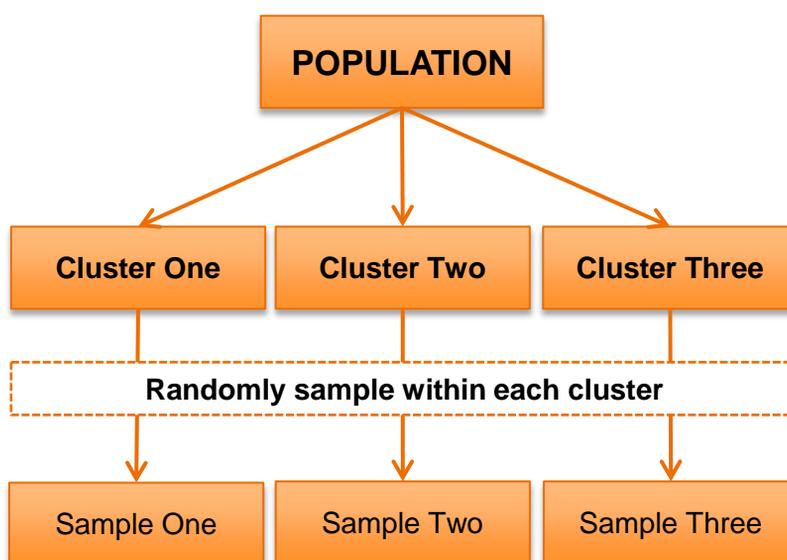
(Answer is on page 4)

What are the different types of samples?

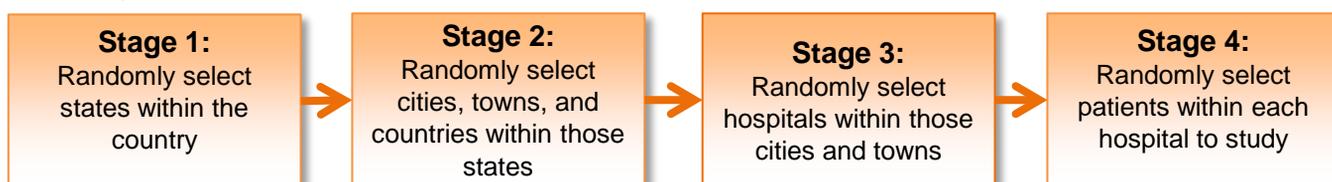


What's the difference between them?

A sampling strategy where the population of interest is divided into representative "clusters" of individuals, among whom a random selection of subjects is drawn. Cluster sampling is often conducted when it is impossible or impractical to draw a simple random sample or stratified sample because the researcher cannot get a complete list of members of the population.



For example



RANDOM CLUSTER SAMPLING

Done correctly, this is a form of random sampling:

- Population is divided into groups, usually geographic or organisational
- Some of the groups are randomly chosen
- In pure cluster sampling, whole cluster is sampled.
- In simple multistage cluster, there is random sampling within each randomly chosen cluster.

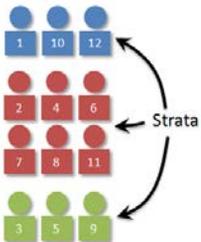
Population is divided into groups:

- Some of the groups are randomly selected
- For given sample size, a cluster sample has more error than a simple random sample
- Cost savings of clustering may permit larger sample
- Error is smaller if the clusters are **similar** to each other.

With this technique, we separate the population using some characteristic, and then take a proportional random sample from each.

A **stratified sample** is obtained by separating the population into non-overlapping groups called *strata* and then obtaining a proportional simple random sample from each group. The individuals within each group should be similar in some way.

Visually, it might look something like the image below. With our population, we can easily separate the individuals by color.



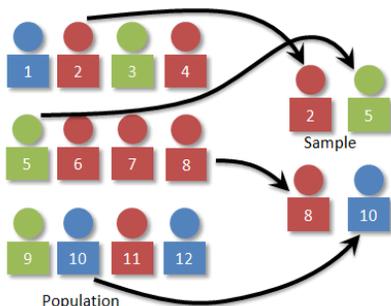
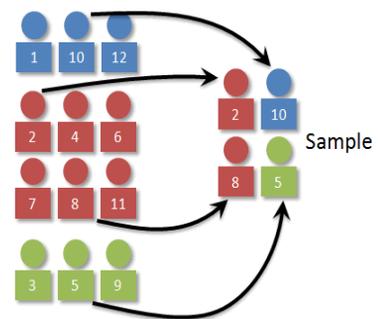
Once we have the strata determined, we need to decide how many individuals to select from each stratum. The key here is that the number selected should be *proportional*. In our case, 1/4 of the individuals in the population are blue, so 1/4 of the sample should be blue as well. Working things out, we can see that a stratified (by color) random sample of 4 should have 1 blue, 1 green, and 2 reds.

Divide population into groups that differ in important ways:

- Basis for grouping must be known before sampling
- Select random sample from within each group

For a given sample size, reduces error compared to simple random sampling IF the groups are different from each other:

- Probabilities of selection may be different for different groups, as long as they are known
- Oversampling small groups improves intergroup comparisons



Simple Random Sampling

Each element in the population has an equal probability of selection AND each combination of elements has an equal probability of selection

- Names drawn out of a hat
- Random numbers to select elements from an ordered list

Stratification vs. Clustering Sampling

Stratification

- Divide population into groups different from each other: sexes, races, ages
- Sample randomly from each group
- Less error compared to simple random
- More expensive to obtain stratification information before sampling

Clustering

- Divide population into comparable groups: schools, cities
- Randomly sample some of the groups
- More error compared to simple random
- Reduces costs to sample only some areas or organisations

Most researchers are bounded by time, budget and academic workload constraints and it becomes difficult to randomly sample the entire population and it is often necessary to employ another sampling technique that is more accessible, the non-probability sampling technique.

CONSECUTIVE SAMPLING

Consecutive sampling is very similar to convenience sampling except that it seeks to include all accessible subjects as part of the sample, which is sometimes considered as the best type of non-probability sampling.

SNOWBALL SAMPLING

Snowball sampling is usually done when there is a very small population size. In this type of sampling, the researcher asks the initial subject to identify another potential subject who also meets the criteria of the research.

JUDGMENTAL SAMPLING

Judgmental sampling is more commonly known as purposive sampling. In this type of sampling, subjects are chosen to be part of the sample with a specific purpose in mind. With judgmental sampling, the researcher believes that some subjects are more fit for the research compared to other individuals.

QUOTA SAMPLING

Quota sampling is a non-probability sampling technique wherein the researcher ensures equal or proportionate representation of subjects depending on which trait is considered as basis of the quota.

CONVENIENCE SAMPLING

Convenience sampling is probably the most common of all sampling techniques. With convenience sampling, the samples are selected because they are accessible to the researcher.

Solution from page 1:
The population is all registered voters in the state. The sample is made up of the 1,009 registered voters who were polled

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