

## basic sampling concepts

it is not easy to address the whole population , so we target a certain sample of the population to save time , cost.

the sample should be : random , convenient , representative , large in number.

we have two types of populations :

- 1- target population : the entire population of interest
- 2- accessible population : the population who are accessible to the researcher from which the sample is drawn

representative sample :

-the sample that will be generalized to the population with validity , confidence and with less sample error

-close relation to the population

-can be easily achieved with :

1- larger sample

2- eligibility criteria : characteristics that define the population and involves :

a- inclusion criteria : the characteristics that you want to address in the population

b- exclusion criteria : the characteristic that you don't want to address in the sample (this gives you a kind of control which will increase the strength of your study which in turn give a more homogenous sample thus increasing internal validity / decreasing external validity )

the term "strata" ( stratum single ): the sample that is drawn from the population

sampling criteria : you determine these criteria according to the research purpose ( with rationale ) which means that you mention the reason of including or excluding criteria in the sample

sampling error :

-no research is devoid of errors but we aim to reduce these errors

-as the difference between sample values and population values decrease : less error

-types of sampling errors

1- random variation :

- naturally occurring ( normally ) : here we have a mean ( average ) and the sample values distributing around it

- sample values can be very high or very low so they cancel each other

2- systematic variation :

- no variation around the mean
- selection is biased
- sample differs from the population

sampling plan types :

a- probability sampling : includes :

- 1- simple random sampling
- 2- stratified random sampling
- 3- cluster-multistage sampling
- 4- systematic sampling

b- non-probability sampling : includes :

- 1- convenience sampling
- 2- snowball sampling
- 3- quota sampling
- 4- purposive - judgmental sampling

non-probability sampling :

1- convenience sampling

- most common and most widely used
- called accidental sampling because you are picking up who you see with your study criteria
- does not reflect population distribution

2- snowball sampling :

in cases where it is difficult for the researcher to have access to the whole population , or it is very rare to find someone with certain (distinctive) characteristics ( patients with mental retardation , AIDS , parkinson ) so you pick a patient from your clinic for ex and this patient will guide you to the others in a stepwise manner , because of this phenomena it's called "network sampling"

3- quota :

- it is done in our parliament
- it's a combination of the previous two : we choose them in a convenient manner but they should have certain characteristics.

4- purpose , judgmental sampling :

- participants are picked by the researcher to achieve certain goals
- used mostly in qualitative studies
- can also be used in quantitative studies to select experts or achieve goals

b- probability sampling :

probability means that the sample was selected randomly which means that each individual ( not always a human being ) has a chance of more than zero percent to be selected in the sample

1- simple random sampling :

- we assign numbers for the individuals in our population and plot them into a table without any order , then close your eyes and select a number randomly ,then from that number start counting until you reach your sample number , and this will be your sample

2- stratified random sampling :

- a combination of quota and simple random sampling : the starting point will be determined by the quota ( certain characteristics )

3- cluster sampling

- used when the simple random sampling is time and money consuming , so it's a helping technique (cost effective and not time consuming)

ex : we have 12 districts , we select 3 of them randomly and choose your sample from each one of them by the simple random sampling way

4- systematic sampling :

- you make a list for the whole population then you select a starting point blindly then you jump with certain number ( every Kth , every 10th for ex )

sample size should be calculated according to a criteria :

1- alpha level : like the p-value : reflects type 1 error : reflects the significance of the sample : when you accept the null hypothesis were in fact it should have been rejected

2- power level : 0.8 : reflects type 2 error : indicate smaller sample size than the supposed one : when you reject the null hypothesis where in fact it should be have been accepted

3- effect size : reflect the strength of the relationship between the variables in the study ( it's inversely related to sample size )

effect size can be :

a- large : need a small sample size , so it's written and documented

b- moderate

c- small : need large sample size so it's not written or documented