

Probability sampling essay sample



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Concept and basics of probability sampling methods

One of the most important issues in researches is selecting an appropriate sample. Among sampling methods, probability samples are of much importance since most statistical tests fit on to this type of sampling method. Representativeness and generalizability will be achieved well with probable samples from a population, although the matter of low feasibility of a probable sampling method or high cost, don't allow us to use it and shift us to the other non-probable sampling methods. In probability sampling we give known chance to be selected to every unit of the population. We usually want to estimate some parameters of a population by a sample. These parameters estimates when we don't observe whole population usually have some errors. Fortunately in probability sampling it is possible that we know how much our estimates are trustable or close to the parameter value from population by computing standard errors of estimates. This is not easily possible in non-probability sampling methods. Types of probability sampling methods

Simple Random Sampling

What is it?

Simple random sampling is selecting randomly some units from a known and well defined population. In this method the sampling frame should be known and all units should have same chance for being selected. How is it done?

(Example)

In simple random sampling, from population of N , n units are selected randomly and the chance of being selected for all units is equal. Different methods and tools can be used for creating random numbers for sample

selection. Standard random number tables and soft-wares with ability of generating random numbers like Open-Epi or Stata are available. Example: You have been asked to perform a KAP survey in a prison. The list of all 2000 prisoners has been given to you. You think that a sample of 300 would be satisfactory for your work. If you want choose 300 of them for interview randomly, you can use a random number generator to generate 300 numbers between 1 and 2000. Most of the time you would have some repeated numbers that should be replaced by new numbers.

Uses

Simple random sampling is a good method for comparing the precision of different methods of sampling and also useful for teaching general probabilistic sampling rules. Criticisms Although when the population is not very big it is possible to do simple random sampling, other methods of random sampling are preferable to it because they brought more precise estimates from population. In big population and wide geographical sampling areas it is not easy to take a list form all units and randomly selecting them.

Systematic Random Sampling

What is it?

In systematic random sampling we use the order of the population list or the place of units in the population for choosing the sample. How is it down?

(Example)

First we should have the list of the population and according to the total number of sample needed we define a value of “ k” to jump over population units and selecting units. If we want select 5 units over a population of 50, we can define $k= 6$ and draw a random number between 1 and 6. Suppose

the random number is 3. Since, the k is 6 the second, third and fourth units will be 9, 12 and 18 respectively. Example: We want to estimate the prevalence of HIV infection among volunteer blood donors in Tehran, 2009. The list of blood donors was available on computer software and the order of patients was according to the date of their referral. We decided to select a sample of 2, 000 from 76, 000. The k was defined as 38 and a number between 1 and 38 was chosen. Choosing 12 then 38 was added to that and second person was the record number 50 and the next units were chosen adding each time the 38 to the previous selected record. According to the participants names repeated units were excluded and replaced by new units with the same method. Uses

Systematic random sampling is very easy and less time consuming. The precision of systematic random sampling is higher than simple random sampling.

Criticisms

The chance of selecting a non-representative sample is very high in this method of sampling especially when there is a correlation between the place of the unit in the population list and the characteristics of the unit that should be observed. Here it is possible that