

Sampling

Sampling is an activity for selecting a limited number of individuals from a population in order to study certain characteristics with the intention to attribute to the total population the characteristics found in this small group of individuals. It is important that a sample be the real "picture" of the population it represents. Also, to be able to generalize to the population the results obtained by students associated to a sample, it requires that the selection has been made randomly. We have to use the appropriate statistical formula to determine the sample size.

EduStat software includes a menu with the options required to select samples based on several designs that meet different situations. It is also possible to manage a sampling design with the registration of the participation and the calculation of the weights if required.

We briefly present information on sampling.

A. Types of samples

Our intention is not to review all the concepts related to sampling. However, it appears useful to list some sample types.

- A sample is **random** when each individual in a population has an equal chance of being selected.
- The sample is **stratified** when the population is divided into homogeneous subgroups and individuals of these subgroups are chosen randomly.
- The sample will be **biased** if some individuals or groups have a higher or lower chance of being selected.
- We may decide to establish an **arbitrary** sample when we select individuals or subgroups because we think that these persons may be considered like barometers of the population.
- The sample is **accidental** when we joined a group of individuals readily available to represent a population.

As noted above, only samples involving chance when the draw it possible to generalize the results (these are the first two forms on the list presented above).

Thus, in an evaluation of learning we select groups of students randomly to be able to generalize to the population findings from this sample. There will always be a margin of error that we will accept. Several techniques can establish that statistic. However, to be able to calculate it, the selection must have been made at random.

B. Some steps in determining a sample

Here is recalled summarily the steps in selection of a sample and manage the selected design. All these steps can be performed using the EduStat software.

1. *Knowledge of the population* – First, we must know as precisely as possible the population to be sampled. Statistical tables showing the population in relation to certain characteristics can be helpful.
2. *Choosing the type of sample* – We must retain the type of sample that is most suitable for purposes of the study or assessment. In our case, it is a choice made at random.
3. *Determination of the sample size* – There are statistical formulas to determine the sample size. However, we should consider the logistical and financial capacity to complete the proposed assessment.
4. *Exclusion or a priori choice of elements or individuals* – We may need to exclude some elements of the population or individuals that we do not want or cannot have in the sample. We must do simulations to see the impact of those choices. It may also happen that we decide to include some elements.
5. *Up sampling or under sampling* – It is possible that we wish to find in the sample greater or lower proportion of individuals belonging to certain subgroups of individuals. In such a situation, it is subsequently necessary to use the weighting.
6. *Participation rate* – After completing the assessment, we must collect the information that will calculate the rate of participation. This information will be useful when we realize the statistical compilations.
7. *Weighting* – Sometimes the adopted sampling procedure provides for the allocation of a weight attached to each student evaluated or each chosen school. This makes it more consistent with reality results.