

**National Surveys of School Principals  
in South East European Countries**

**Sampling Preparation Manual**

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## 1. Introduction

The purpose of this document is to set the framework for and guide the sampling process of schools to be surveyed in the South East European region (Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Moldova, Montenegro, Romania, and Serbia). The survey is carried out in the first phase of the initiative entitled Advancing Educational Inclusion and Quality in South East Europe with the main aim of providing empirical evidence for the next phase, namely policy advocacy and community level interventions seeking to further parental involvement in school level decision-making. Therefore, it is of key importance to ensure that survey statistics provide valid estimates of the attitudes and opinions of school principals related to parental involvement in school level decision-making.

This manual contains the description of the protocols which are to ensure that the agreed evidence standards are met throughout the survey process. Once identifying the quality standards in light of the aims and objectives of the initiative, the activities related to the identification of the school sample will be carried out respecting the state-of-art in scientific sampling. Furthermore, to minimize coverage error we need to ensure that the school sample is drawn from a sample frame as close as possible to the full population of schools in each country. Consequently, the procedures to identify and select the school samples in each country are central to the quality (i.e. reliability and validity) of the outcomes of the country surveys of school principals.

To ensure that the adopted evidence standards are closely followed throughout the survey, school sampling will include the following six main aspects:

- a) *The adoption of quality standards* – by relating project aims and objectives to the results from the survey process.
- b) *The identification of the population to be surveyed* – by defining the correspondent level of schools in all countries that are going to be surveyed.
- c) *The compilation of the sample frame* – by including all concerned schools into a list from which to draw those included in the sample.
- d) *The choice of the sample theory* – by selecting the method to draw the school samples from the sample frame and to identify possible national variations.

- e) *The replicability of sampling procedures* – by recording the sampling process in each country.
- f) *The effectiveness of the survey operations* – by agreeing on survey procedures and contingency plans.

In each stage of the survey process quality checks will be applied to ensure that interviewers collect and handle information carefully and according to the same protocols. Checks and verifications throughout the research process will be carried out systematically, according to pre-established plans. Furthermore, at the end of each stage a consensus building session will be organized with the participation of subject matter experts and survey experts from both the country teams and the international research team.

The document is structured in six sections, each detailing a critical milestone of the sampling process. The first section deals with quality standards. The second section discusses the steps leading to the identification of the population to be surveyed. The next section deals with the compilation of the sample frame of the relevant schools in each country. The fourth section introduces the activities related to the choice of the sample theory in relation to the adopted quality standards, the type of school selected to be surveyed and the financial constraints. The fifth section discusses the protocols to be adopted to ensure the replicability of sampling procedures. Last but not least, the sixth section includes issues related to the indicators capturing the effectiveness of the survey operations.

## **2. Quality Standards**

The minimum expectation of the survey is to produce results that can be generalized to the whole school principal population at the given educational level. Considering that we have a fixed budget to carry out the survey our priority is to select the sampling theory that allows maximising precision. The discussion on the alternatives available in what concerns the level of precision and accuracy, and the response rate that can be obtained with a fixed budget will be detailed in the subsequent section of this manual. The essential message is that we need to identify an optimal allocation subject to set quality standards and constraints ensuring that inference about population parameters using sample statistics is robust.

### **3. The Goal of the School Principal Survey**

The national survey of HT investigates the nature of regulation and extent of equitable implementation of parental participation (in decision-making, in extracurricular activities, and in the education of one's own children) in **state elementary schools**; in relation to school level factors and to the attitudes and beliefs of HT; both at national and international level. To achieve this in this section we plan to discuss issues related to the definition of the survey's target population, which is followed by the main methods of data collection and the sample design framework.

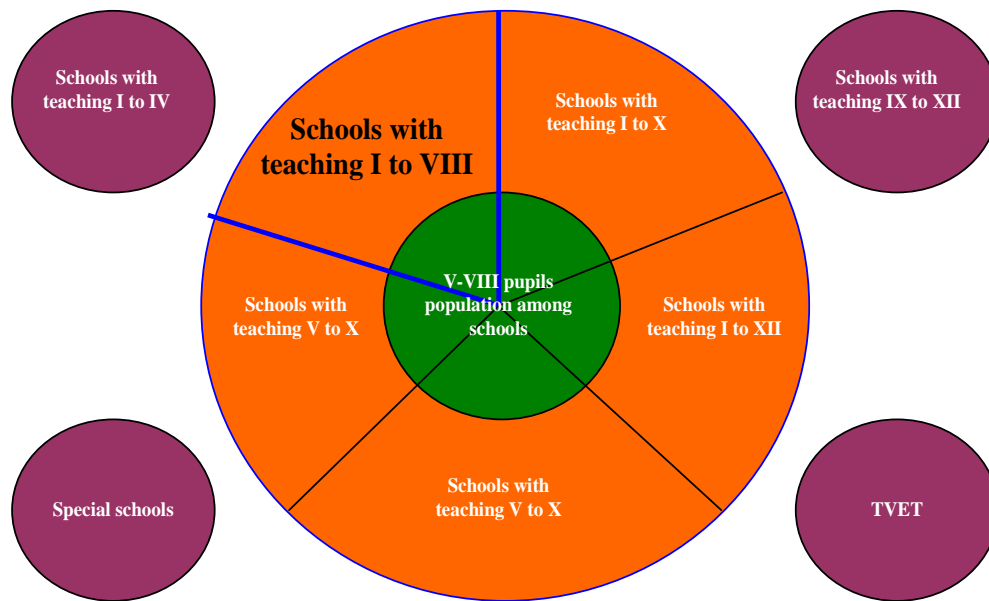
### **4. Defining the Target Population**

To ensure both national and cross-country consistency in analysis a standard definition of the population to be surveyed needs to be developed. In identifying the target population of the survey, i.e. state elementary schools, the task consists in defining both the level of education that is under focus, and ensure a feasible coverage of the target population given the different structures of education system at the primary and secondary levels. To address the first issue the table below shows the classificatory differences that exist among the countries participating to the study. We observe that according to the definition in the project description the emphasis of the initiative is on parental participation first and foremost in upper level primary or lower level secondary education.

	Primary	Secondary	Compulsory	Notes
Albania	9 years	3 years		
Bosnia and Herzegovina	4 years	Lower secondary 4 years Upper secondary 4 years	First 8 years	School starts at age 7
Kosovo	Lower level 4 years Upper level 4 years	?		
Macedonia	4 years	Lower secondary 4 years Upper secondary 4 years	First 8 years	School starts at age 7
Moldova	4 years	?		
Montenegro	4 years	Lower secondary 4 years Upper secondary 4 years	First 8 years	School starts at age 7
Romania	4 years	Lower secondary 4 + 2 years Upper secondary 2 years		
Serbia	Lower level 4 years Upper level 4 years	4 years – grammar schools, gymnasiums, art schools, and vocational schools	First 8 years	School starts at age 7
Source: <a href="http://www.see-educoop.net/">http://www.see-educoop.net/</a>				

To address the second issue we observe, from the diagram below, that there are a large number of possible overlaps in the school structure, i.e. the level of education performed. Taking this sample variability of the targeted level of education (corresponding to grade 5 to 8) into account we observe that this could be organized in schools with teaching exclusively on this level, or in schools where teaching covers grade I to VIII, I to X, I to XII, VIII to X, or VIII to XII.

The overlap of the target level population with other levels of formal education lead to a series of sample variability possibilities that need to be addressed prior to developing the sample frame, as this will define the nature of the target group studies as well as the statements that could be formulated about the given population. First of all, the diagram shows that we face the issue of within-country fragmentation of the target level population across schools offering different levels of education. Second, there are likely between-country sample variations in regards of the target level population distribution among schools covering different levels of education. To systematically address these issues, in the following subsections, we will discuss the options in defining the target population and the implications this will have for the outcomes of the survey.



The pupil population studying from V to VIII grade level, in the eight countries participating at the survey, is distributed in schools offering education at one of the following six levels: V to VIII, I to VIII, I to X, I to XII, VIII to X, or VIII to XII (as, also, shown in the above diagram). To cover the whole target population we would need to include in the sample all schools that offer education at this level.

To cover all pupils studying at V-VIII level would imply the inclusion in the sample all schools that include this level V to VIII. However, this raises a series of new issues, such as the differences in the nature of implementation of parental participation at the target population level might systematically vary in function of the educational levels covered by schools. While this would allow for a generalization for the whole target population it would bias the responses of school principals, as the implementation of parental participation is organized at school level and not by level of education with school. Thus, by expanding coverage to the whole sample population in a probabilistic framework – by including in the sample schools offering education from grades I to X, V-X or I to XII –, among other problems, would also make the accounting for within sample variability of school principal response heterogeneity highly problematic considering the limited possibility to distinguish within school parental

participation at the target population level and that from different levels of education.

On the other hand, selecting one given class of schools might reduce our ability to generalize results to the whole target population. For instance, in the case of the Romania if considering exclusively schools with education grades V to VIII the universe consists of only 12 schools. Nevertheless, if we consider schools covering education from grade I to VIII we observe that there are a total of 6,135 educational units. However, 76% of these schools are located in rural areas, while only 24% are in urban areas. It is also known, that a significant share of parents in rural areas prefer to enroll their students to urban schools as early as possible, and in urban areas I to VIII class schools are also only a second choice to parents. In fact, in urban area they would correspond to what inner city schools stand for. Yet, by considering only schools with education exclusively on this level excludes an important share of pupils grade V to VIII studying in schools offering education from grades I to X, or I to XII.

In conclusion, the first issue we need to address is **limited coverage vs. sample heterogeneity**. The solution proposed is to reduce, as far as possible, sample heterogeneity, and include in the sample only schools with education from grade I to VIII. If this choice sustained, we will be able to capture both within and within country variability of the implementation of parental participation in the case of schools offering education from grade I to VIII.

## 5. Data collection

There are two main methods to collect data (after excluding experimental design and observation study) about the critical parameters of a given target population, i.e. school principals of schools offering education exclusively from grade I to VIII. The most exhaustive method is to carry out a *census*, and by obtaining the sought information from each member of the school principal population we could obtain the true population parameters. Yet, this method is only limitedly feasible in the case of large populations considering the effort needed to inquire about each member of the given population, not to mention the financial resources that such an endeavor would imply. To economize on costs, in the case of large target populations, we could obtain data from a subset of the given target

population by applying *survey sampling*. Although applying this method of data collection would significantly reduce the costs of gathering information we need to keep in mind that drawing conclusions on the collected sample data will imply to estimate the sample statistics for different attributes of the target population. As the sample statistics are estimations of the true population parameters (the true values of the given attributes) we need to ensure that we obtain as accurate, precise and representative sample statistics as possible given constraints. To guarantee that our samples respect these requirements we need to ensure that our sampling plans address possible methodological problems that might appear during the survey process. The most common methodological problems are related to the poor representativeness of the survey sample, measurement error, and sampling error.

First we need to ensure that the sample statistics does not systematically over, nor under-represent critical parameters of the target population. For this, we need to make sure that the drawn sample is representative. By failing to ensure that the sample is representative might lead to what its known as selection bias. The most common forms of selection bias occur in the situations when a given sub-group of the target populations is underrepresented in the survey sample. Alternatively, despite a representative survey sample, we might encounter the situation in which those not responding to the survey are in a systematic way different from those responding, which is also known as nonresponse bias.

A second possible source of error relates to biases due to measurement error that among other have emerge from poor operationalization of key concepts to be measured in the survey. Another important sub-class of measurement error is known as respondent bias given either the poor quality of survey questions, or social desirability.

The third source of bias emerges from the level of accuracy of the estimated sample statistic to describe the population parameter. The level of sampling error is certainly zero only if the whole population is included in the sample. Yet, by sampling a certain number of observation from the given target population we are concerned about the precision of our statistical estimate of the true population parameter. Thus, besides following basic rules to avoid the above discussed methodological problems we also want to know the level of precision with which our sample statistics estimates the true population parameters. To express the precision related with a statistical sampling method we use the sample

statistic and the calculated margin of error. While we already discussed the source of the sample statistic, we did not touch upon the margin of error, which is simply the range of the values that are above and below the calculated sample statistic. The interval estimates obtained this way provides valuable information about the precision of the survey method, but in order to have a full picture we also need to report the level of confidence of the interval estimate, which is our belief about how likely it is that the true population parameter is included in the confidence interval of our sampling method.

## **6. Sample design framework**

Once the target population is defined, the possible methodological problems discussed and the basic concepts of statistical estimation introduced we can turn to discuss the sampling plans. To ensure between-country comparability of survey statistics we need to ensure that similar sample designs are used in all contexts. Nevertheless, the sample design needs to be able to accommodate adaptations to peculiar country contexts. Keeping these in mind, in the following the method of simple random sampling will be discussed. We need to be aware that by opting for this sampling method we assumed that there are no systematic differences among any sub-groups of the sample population (this assumption will be relaxed later).

Thus, simple random sampling ensures that each element of the target population has an equal and known probability to be included in the statistical sample. This method might be feasible in our case as we control for a series of possible sample heterogeneity problems in that way the target population has been defined (true with the price of a lower coverage of pupils grades V to VIII). To ensure that reliable estimates of the whole population for each country can be made, country specific probability samples will be designed. Country specific samples will use different probability samples to reduce the likelihood of sample bias. In drawing the simplest random sample in each country the following steps will be applied:

- Step 1. Each school will be enlisted in spreadsheet file.
- Step 2. From a random number list each school is assigned a number.
- Step 3. Schools are listed based on the random number.
- Step 4. Starting from the top, schools are selected until the sample size reached.

If in the case of some countries significantly different known population characteristics are identified, more complex sampling methods, such as stratified sampling, will need to be applied. One such instance of stratification could be the urban-rural division, other geographical divisions (historical regions), and separated schools systems within the same country (i.e. Bosnia and Herzegovina). In the case of stratification, the relevant stratification variables need to be identified with justification for their selection and population size for each stratum. In such a case, we will first need to identify the different strata and for each of them carry out the four steps described above.

## **7. Simple Random Sampling Plan**

The target population of the survey includes schools with teaching from grade V to VIII, in each of the eight participating country. For each country we need to compile the sample frame with a standard of coverage of at least 90%. Once this is done, we can re-open thinking about the margin of error and confidence level standards we consider acceptable for the survey. Here is no standard answer, but common practice, or reliable data, implies that the margin of error plus or minus to be minimized, while the confidence level maximized. This is because the statistical estimations of our survey will judged to be or not reliable sources of information.

In the table below, we present the calculations for the minimum recommended sample sizes for  $\pm 3$  and  $\pm 5$  margin of error and by assuming a 90% and 95% level of confidence for a simple random sampling design. Recall than in our survey we are interested in estimating the proportions of HTs' with given attitudes and believes rather than the averages of their attitudes and believes. Therefore, we apply the sample size determination formula for categorical variables. The results for our countries are presented in the table below.

		Number of secondary schools	Minimum estimated sample size			
			90%		95%	
			±3	±5	±3	±5
1.	Albania	1,828	535	237	674	317
2.	Bosnia-Herzegovina	600	334	187	385	235
3.	Kosovo	919	414	210	495	272
4.	FYR of Macedonia	518	307	178	349	221
5.	Moldova	661	352	193	409	244
6.	Montenegro	135	CENSUS			
7.	Romania	6,135	670	260	910	362
8.	Serbia	1,300	477	225	587	297
TOTAL			<b>3,224</b>	<b>1,625</b>	<b>3,944</b>	<b>2,083</b>

Considering the large differences in minimum estimated sample size we need to discuss the impact different levels of margins of errors and confidence levels could have on the outcomes of the survey. In simple terms the margin of error tells us the range within which our finding is likely to vary. For instance, if we find that 60 percent of respondents consider that parental participation is “very high”, and we had a  $\pm 5$  margin of error, this means that “very high” parental participation will range between 55 and 65 percent. Complementary to this, the level of confidence tells us the number of times we believe that the response ranges between the given values if we were to repeat the survey 100 times. Therefore, before starting to interview people we need to decide over the “acceptable” margin of error and confidence level of the survey. As already pointed out there is no magical number, but there is tacit agreement in each field. Thus, in the field of education studies a confidence level of 95% is closest to the standard. In what concerns the margin of error this is mostly about the degree of fine-tuning of results in light of the available resources. In our case, we observe that to reduce the margin of error from  $\pm 5$  to  $\pm 3$  percent implies to nearly double the sample size. This, again, is an issue of how serious are we about the precision level of the survey in light of the resources available.

The next issues to be handled are non-response rates. Besides the development of an unbiased sample, careful attention needs to be paid to ensure that the respondent rate is as high as possible. Low response rates could lead to biased results due to non-response error as those who

did not respond could have systematically different characteristics compared to those who responded. Thus, besides seeking a high response rate (i.e. at least 70%), it is essential that protocols be adopted and communicated to interviewers concerning the recording of non-responses and the circumstances under which these occurred. Under no circumstances should any other person but the school director be interviewed.

This, among others, raises two important issues. First, there is the issue whether those non-responding are systematically different from the sample population. This needs to be verified. Second, if finding out that there is no systematic difference between those responding and those refusing, we need to identify ways to ensure that the minimum required sample size is realized. One method of doing this is to draw a reserve sample, based on a response rate assumption (from previous research). For instance, to allow for an expected 70% response rate the total sample that needs to be drawn is presented in the table below.

		Number of secondary schools	Minimum estimated sample size			
			90%		95%	
			±3	±5	±3	±5
1	Albania	1,828	764	339	963	453
2	Bosnia-Herzegovina	600	478	268	549	335
3	Kosovo	919	593	300	705	387
4	FYR of Macedonia	518	439	255	498	315
5	Moldova	661	504	275	583	347
6	Montenegro	135	135	135	135	135
7	Romania	6,135	962	372	1299	516
8	Serbia	1,300	683	322	837	424
<b>TOTAL</b>			<b>4,558</b>	<b>2,266</b>	<b>5,569</b>	<b>2,912</b>

There is also a debate whether we should from first hand draw a larger sample, or to draw the sample and a certain number of replacement schools. There are arguments on both sides, but more accurate is to draw the sample, see the response rate and decide whether the obtained response rate is acceptable, if there is non-respondent bias, and under what circumstances to use replacement schools to be included in the sample.

## 8. Stratified Sampling Plans

I am not sure we can afford doing it, but if not there might be some severe criticism towards our design. Therefore, I will discuss, shortly, the possibilities of doing it.

The target sample population might be systematically different, the most common such distinction is between urban and rural schools. Furthermore, we need to verify if the country legislative context is similar to those included in a sample. Thus, in situations like BiH we might need to divide the sample in more than one stratum. We need to explore all these in detail prior to deciding over the number of division included in the sample. Last but not least, we need to consider local survey practices. For instance, in the case of Romania it is common to also introduce a regional stratum to account for differences that might persist in the case of historical regions. Yet, our main guiding principle needs to be the one of relevance for our study.

In the case of stratified sample design we need to divide the sample frame into sub-frames, and to sort each stratum by the stratification variable. Once identifying each sub-frame we will randomly select the sub-sample from each frame. Thus, besides the school identification number we also need to also include values for the stratification variable.