

Population Coverage and Sampling in SEA-PLM 2024 Survey



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Introduction to SEA-PLM sampling.....	2
The regional target population.....	2
National target population, coverage, and exclusions.....	3
Exclusions	4
Stratification	7
Population scope and coverage	10
Sample size	12
Sample selection process	13
First stage: school selection.	13
Second stage: class and student selection	16
Sampling yield and response rate	17
Secondary sample outcomes – national option.....	18
Annex 1- SEA-PLM 2019 sampling tables	19
Annex 2 – SEA-PLM 2024 Sampling Framework	24

Introduction to SEA-PLM sampling

SEA-PLM 2024 sampling activities were guided by the SEA-PLM 2024 Sampling Framework (see Annex 2), which included, apart from the practical instructions to fulfill the sampling process by national centres and the main contractor involved the process, a total of 15 sampling standards as set forth in Section 2 of the *SEA-PLM 2024 Technical standards (2nd Edition)*.¹ These standards delineated the target population definition, school and student sampling methods, and minimum participation requirements, aimed to achieve precise estimates of fifth-grade student learning outcomes in the Southeast Asian region by enabling high-quality, consistent data across the region and over time.

The SEA-PLM sampling framework represents a commitment to high participation standards; therefore, careful planning is required to ensure these standards are achieved. During the sampling preparation phase, national teams referred to these standards. Where standards were not achieved or unforeseen circumstances were encountered, the results and datasets were officially annotated within international, regional or national reporting to help readers evaluate the quality of outcomes. All users are invited to consider official annotation and limitations in reporting and use of datasets.

The regional target population

The regional target population for SEA-PLM surveys is defined as follows:

The target population for SEA-PLM is all students enrolled in the grade that represents five years of schooling, counting from the first year of ISCED Level 1, referred to in SEA-PLM as Grade 5.

The regional target population includes all students enrolled in the Grade 5 in each participating country. It intends to include all students from all schools across all educational sub-systems and types² within a country that falls under the authority of the government as reported by the Ministry of Education. The exclusion of schools is permitted only under clearly defined and agreed criteria, as elaborated in the following section.

ISCED Level 1 refers to UNESCO's International Standard Classification of Education (ISCED)³ and corresponds to the first stage of basic education or primary schooling. Students participating in the survey were at equivalent stages of schooling. Grade levels and the age of entry into formal education vary between countries. In all cases, the grade definition corresponded to Grade 5 of primary education.

¹https://www.seaplm.org/images/PUBLICATION/2025/SEA-PLM_2024_Technical_Standards_2nd_edition_20032025_v2_.pdf

² regardless of the official policy on the language of instruction in primary education curriculum

³UNESCO. 2012. International Standard Classification of Education: ISCED 2011, p30.
<http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>

National target population, coverage, and exclusions

SEA-PLM samples aim to maximise the coverage of the Grade 5 national population across different education systems, ensuring consistency across the different assessment cycles and representing students enrolled in formal education at the time of the survey. Significant changes in the target population between two rounds of assessment would impact how results must be interpreted over time, particularly where there are non-negligible changes in enrolment, impacts on national coverage because of (for example) a natural disaster or security issues, and out-of-school rates in primary education. Significant exclusions of schools and students from the target population would affect the level of national representativeness of the target population for a given survey. Therefore, the objective is to minimise the total number of exclusions and changes in population coverage and exclusion categories.

Changes over time, reductions and exclusions impact the coverage of the total desired population, requiring some amendments to the descriptions of the population definition and participant description – for example “Country except for Province A” - in reporting. Any exclusions were well-documented and quantified during the sampling preparation process.

Table 1 shows the information by country of the national target population definition for SEA-PLM 2024. Table 7 in the Annex 1 shows similar results for the SEA-PLM 2019 large-scale assessment.

Coverage

The national target population (or desirable population) is established based on the regional target population requirement and the list of schools and students made available by each participating Ministry of Education (referenced as the eligible population of Grade 5 students) as recorded at the time of a given SEA-PLM survey. Countries are solely responsible for sharing the most updated list of schools and students representing the student population registered (enrolled) in Grade 5.

In rare cases, reducing national coverage to less than the entire regional target population or changing the population significantly between rounds of assessment may be observed in a country due to political, operational, or administrative reasons. For example, particular schools or geographic regions might be removed from the target population during a natural disaster, a political unrest, or an unforeseen change in the school management system.

Decisions to reduce coverage are made with consideration for how the national results are consequently reported. Proposals and particularities that led to the impact on the coverage of the SEA-PLM 2024 national target population were documented by countries and approved by the SEA-PLM Regional Secretariat, as reported in the box below.

In addition, further exclusions and reductions in national target population coverage due to excluding specific schools or individual students within schools were possible and necessary under certain conditions, as documented below the box.

Coverage in SEA-PLM 2024

Each country defined its Grade 5 main target population based on official enrolment data made available by its ministry at the time of the data collection. The size and composition of the SEA-PLM 2024 national cohorts differ to some extent from the SEA-PLM 2019 cycle, with changes ranging from minor to substantial. These differences may be attributed to a decline in school enrolment in the aftermath of COVID-19, a decline in birth rate, or other unforeseen challenges, such as security-related disruptions in certain countries.

Across participating countries, the variations in student populations between the two cycles ranged from a slight decrease of 1 per cent to more notable shifts, such as a 59 per cent decline or a 29 per cent increase in enrolment figures (see Table 2.3 in Main Regional Report). Readers are invited to carefully consider those changes to ensure a comprehensive understanding of their impact on education systems and the SEA-PLM findings.

In Myanmar, challenges in accessing primary schools in 2024 have led to a significant change in the Grade 5 eligible population compared with 2019.⁴ Caution is required when interpreting and comparing Myanmar 2024 estimates due to significant changes observed in the composition of the school population between the SEA-PLM 2019 and 2024 surveys.⁵

Exclusions

Once the population coverage is defined, exclusions can occur at a school or student level. School-level exclusions refer to whole schools being excluded from the school sample frame, while student-level exclusions refer to specific students within sampled schools being excluded.

A 5% threshold was adopted as the upper limit for excluding members of the survey population due to excluding schools or individual students within schools (SEA-PLM Technical Standard 2.2). The objective of these exclusions is to facilitate the administration of the survey, but they must be minimized as much as possible as indicated. The following outlines conditions under which reduced coverage and exclusions might occur.

School-level exclusions

Schools were excluded from the survey for practical reasons, such as increased costs or difficult survey conditions. Examples of school-level exclusions include:

- very remote locations (inaccessibility)
- very small schools (for example, less than five students in the target grade)
- international schools (offering a curriculum other than the prescribed national curriculum)
- schools where the language of instruction was different to the language(s) of the test)
- schools catering exclusively to students who are considered student-level exclusions.

⁴ In 2019, the national sample of Myanmar was drawn from 866,200 Grade 5 students and 36,600 primary schools. In 2024, the Grade 5 defined student target population in Myanmar covered approximately 403,584 students and 17,044 primary schools, based on 2024 registration rates referenced by the country prior to the SEA-PLM 2024 data collection. Four administrative regions were entirely excluded compared with 2019.

⁵ The SEA-PLM Secretariat includes this disclaimer under each publicly published table and graphic of results.

Student-level exclusions

Some students from sampled schools may be unable to access the assessment and, therefore, need to be excluded. The international student-level exclusion categories were defined as follows below:

- students with functional disabilities — these are students who have physical disabilities in such a way that they cannot take the SEA-PLM test. Functionally disabled students are those with a moderate to severe permanent disability. Students with functional disabilities who can perform the assessment should be accommodated within reason rather than excluded in the test situation.
- students with intellectual disabilities — these are students who have a cognitive, behavioural, or emotional disability confirmed by qualified staff, such that they are unable to take the SEA-PLM test. These are students who are cognitively, behaviourally, or emotionally unable to follow even the general instructions of the test. Students should not be excluded solely because of poor academic performance or everyday disciplinary problems. It should be noted that students with dyslexia or other such learning disabilities should be accommodated in the test situation, within reason rather than excluded.
- students with insufficient assessment language experience, following the three criteria:
 - they are not native speakers of the assessment language(s),
 - they have limited proficiency in the assessment language(s) and
 - they have received less than one year of instruction in the assessment language(s).

To be excluded due to insufficient assessment language experience, students must meet ALL three criteria.

Exclusion in SEA-PLM 2024

School-level and student-level exclusions due to reasons listed in this section are summarised in Table 1. In all cases, student-level exclusions due to school or student reasons remain under or very close to the 5% threshold adopted as the upper limit for excluding members of the survey population. The reasons and level of inclusion are similar to those observed in the SEA PLM 2019 survey. The Philippines included the BARMM regions in SEA-PLM 2024 (excluded in 2019, under conflict areas category).

Table 1 shows impact of the student and school-level exclusion on the reduction of the national target population coverage.

Table 1 Population definition and coverage in SEA-PLM 2024 and comparison with SEA-PLM 2019

Country	2024						2019	
	Desired population Grade 5*	School-level Exclusions	Target population before sampling	Schools	School sample coverage	Reasons for exclusion	School sample coverage	Reasons for exclusion
Cambodia	299,176	1,027	298,149	5,561	99.7%	Target grade enrolment < 10	100.0%	Special need education blind students
Lao PDR	134,242	1,660	132,582	6,770	98.8%	Less than 5 students in grade 5	99.3%	Less than 5 students in grade 5, International and inclusive schools
Myanmar	418,153	14,569	403,584	17,044	96.5%	Very small school (<= 5 students)	95.4%	Very small (<= 5 students), Very remote and conflict schools
Malaysia	456,459	5,550	450,909	7,607	98.8%	Special education / very remote schools	99.6%	Special Education / Small (<= 5 students) Schools
Philippines	2,351,245	67,884	2,283,361	42,507	97.1%	Five students or less / International / Islet / SEN	95.1%	Five students or less / International / Islet / SEN / Conflict areas
Timor Leste	31,695	1,796	29,899	895	94.3%	CAFE schools / enrolment less than ten	NA	NA
Viet Nam	2,297,427	594	2,296,833	14,469	100.0%	Less than 10 students in grade 5 / International schools / SEN schools	100.0%	Less than 5 students in grade 5 / Internationals schools / SEN Schools

*At the time of the definition of the 2024 target population. The desired population reflects total enrolled Grade 5 population data made available by countries during the preparation of the samples. For some countries, the total enrolled Grade 5 population shared by countries at that stage was still provisional in the administrative dataset of the Ministry, some weeks prior to the main survey data collection. Differences observed between desired populations may slightly shift across the different iterations, for example Cambodia and Viet Nam revised significantly overall number of their total enrolled population since the original definition, see Table 2.3 Main Regional Report.

Stratification

Stratification is a process of organising the sampling frame to improve the efficiency of the sample design. Stratification can lead to improved reliability of estimates. When required, it can also enable separate sample designs for subgroups of the population.

Each country provided a set of variables for explicit and implicit stratification of the school frame. These correspond to the unique situation of each country. It is recommended that the selected variables are considered to have a significant impact on student outcomes measured at the school level. Well targeted stratification can improve the representation of key population subgroups, enabling improved analyses of outcomes with respect to these groups.

Table 2 shows the explicit and implicit stratification variables used to organize the school frame and draw the school sample for each country. Table 7 has the same information for SEA-PLM 2019. Overall, countries used similar variables for each cycle. Some main differences were the change from implicit to explicit use of the variables. This allows to target more sector or regional areas across each country. In any case, the efficiency of the sample increases when explicit or implicit stratification is used.

Table 2 Explicit and implicit stratification variables by country SEA-PLM 2024 survey

Country	SEA-PLM 2024						
	Explicit stratification			Total Strata	Implicit stratification		
	Variable	Value labels	Levels		Variable name	Value labels	Levels
Cambodia	Province	25 provinces/municipality	25	49	Sector	Public, Private	2
	Region	Urban, Rural	2		Geographical zone	Phnom Penh, Plain, Tonlesap, Mountain, Coastal	5
Lao PDR	Province	1:Vientiane Capital (VTC), 2:Phongsaly (PSL), 3:Oudomxai (OUX), 4:Luangnamtha (LNT), 5:Bokeo (BK),6: Luangprabang (LPB), 7:Huanphan (HP), 8: Xaiyabouly(XBL), 9:Xiengkhuang (XK), 10:Viengchan (VC),11:Bolikhambxai(BLKX), 12:Khammuan(KM), 13:Savannakhet(SVNK), 14:Salavan(SLV), 15:Sekong(SK), 16:Champasak(CPS), 17:Attapeu(ATP), 18:Xaisomboun(XSB)	18	18	None		
Myanmar	Region/State	Yangon, Mandalay, Sagaing, Magway, Ayeyarwady, Bago (East), Bago (West), Tanintharyi, Naypyitaw, Mon, Kayin, Shan (East), Shan (South),	13	13	Location	Rural, Urban	2
					School size	Small school (N <= 50), medium school (51<=N<= 100), large school (101<= N<= 300), Extra-large (N > 300)	4

Malaysia	State	Kedah, Perlis, Pulau Pinang, Perak, Selangor, Negeri Sembilan, Johor, Melaka, Kelantan, Terengganu, Pahang, Kuala Lumpur, Putrajaya, Sabah, Sarawak, Labuan	16	16	Sector	Public, private	2
					Location	Urban, rural	2
					School type	National school / Chinese National-type school / Tamil National-type school / Government-aided religious school / Indigenous national school / Private school	6
Philippines	Region	All 17 regions	17	17	School type	Public, private	2
					Total enrolment of school	400 and above / 200 - 399 / 100 - 199 / 55-99 / 20 -54 / 19 and below	6
Timor Leste	Municipalities	Aileu, Ainaro, Atauro, Baucau, Bobnaro, Covalima, Dili, Ermera, Liquica, Lautem, Manufahi, Manatuto, Viqueque, Oecusse	14	14	School type	Public/Government, private and Catholic	3
					Location	Urban and rural	2
Viet Nam	Zone	North, Central, and South	3	6	Location	Urban, rural, and remote area	3
	Funding	Public schools and non-public schools	2				

Population scope and coverage

According to the SEA-PLM sampling framework, the level of population exclusions at both school- and student-level within school, should not be higher than 5% of the desired target population (Standard 2.2). This is set to avoid sample responses to be biased against the excluded population. After drawing the student sample within the sampled schools, some students were excluded from participating in the survey for several reasons.

Table 3 shows these exclusion categories and the number of students excluded by country for SEA-PLM 2024. This student-level exclusion rate is added to the initial school-level exclusion rate to determine the total student exclusion rate. Overall, total exclusion rates went from 0.9% in Viet Nam to 7.2% for Timor Leste. Timor Leste and the Philippines showed a level slightly above what is recommended; in the case of Timor Leste, the exclusion of Portuguese speaking (CAFÉ) schools represented a significant proportion (2.5%) of overall exclusion; and in Philippines, the exclusion of a significant number of students for other reasons. But overall, results have improved when compared to the 2019 assessment.

Table 8 in the Annex 1 shows similar results for the SEA-PLM 2019 cycle.

Table 3 Student within-school and school-level exclusion rate by country in SEA-PLM 2024 and comparison to SEA-PLM 2019

Country	SEA-PLM 2024								SEA-PLM 2019		
	Students with functional disabilities	Students with a cognitive, behavioural, or emotional disability	Students with insufficient assessment language experience	Other (No longer in school, etc)	Total	Weighted exclusion rate (% of students in sampled schools)	School-level exclusion rate	Total exclusion Rate	Weighted exclusion rate (% of students in sampled schools)	School-level exclusion Rate	Total exclusion rate
Cambodia	8	3	1	35	47	0.7%	0.3%	1.1%	0.5%	0.0%	0.5%
Lao PDR	3	4	7	1	15	0.2%	1.2%	1.5%	1.2%	0.8%	2.0%
Myanmar	7	12	0	0	19	0.2%	3.5%	3.7%	1.0%	4.6%	5.6%
Malaysia	15	1	0	6	22	0.4%	1.2%	1.6%	0.4%	0.4%	0.8%
Philippines	9	17	2	85	113	2.6%	2.9%	5.5%	3.2%	4.9%	8.1%
Timor Leste	13	9	1	58	81	1.5%	5.7%	7.2%	NA	NA	NA
Viet Nam	8	31	3	13	55	0.9%	0.03%	0.9%	0.6%	0.0%	0.6%

Sample size.

The SEA-PLM Sample Framework indicates that a minimum sample size of 150 schools and 4000 students is needed for each country (Standard 2.11). The final sample design must contemplate the possibility of school and student nonparticipation. For this reason, special care was taken to sample enough schools to gather a student sample size exceeding the minimum specified, by adding more schools to the sample selection. In all cases, the drawn sample was enough to cover the minimum standards.

Table 4 Population and school sample size by country and survey

Country	SEA-PLM 2024				SEA-PLM 2019			
	Enrolment	Schools in Target population	Target school sample	Average students per school	Enrolment	Schools in Target population	Target school sample	Average students per school
Cambodia	298,149	5,561	195	54	332,543	7,310	177	45
Lao PDR	132,582	6,770	208	20	146,784	7,074	236	21
Myanmar*	403,584	17,044	197	24	904,989	46,209	203	20
Malaysia	450,909	7,607	158	59	447,024	7,362	160	61
Philippines	2,283,361	42,507	162	54	2,203,457	51,147	176	43
Timor Leste	29,899	895	171	33	NA	NA	NA	NA
Viet Nam	2,296,833	14,469	153	159	1,391,354	15,093	150	92

* Caution is required when interpreting and comparing estimates for Myanmar due to significant changes observed in the composition of the Grade 5 population between the SEA-PLM 2019 and 2024 surveys.

Sample selection process

The process to draw the sample for the SEA-PLM survey for each participating country followed the instructions laid out by technical standards 2.5, 2.6, 2.7 and 2.8. The method used is the two-stage stratified cluster sample with probability proportional to size (PPS).

First stage: school selection.

In a first stage, schools are grouped by explicit strata. Each explicit stratum operates as an independent sample from the rest, and the following process is done:

1. For each explicit stratum, schools are sorted by the combination of explicit stratum and the school's measure of size (MOS), which is equivalent to the number of grade 5 students enrolled in the school. This makes schools stay closer to other similar schools, defined as schools with similar combinations of implicit variables and MOS.
2. A variable called MOS_AC_k is calculated for every school k in the frame. It corresponds to the sum of all MOS of all preceding schools plus the school. So for a Stratum with K schools, the value (for $k=1, \dots, K$) is

$$MOS_AC_k = MOS_AC_{k-1} + MOS_k$$

3. A sample interval (SINT) is calculated, which corresponds to the aggregated MOS of all schools in the stratum, divided by the number of schools to be sampled in the stratum (n_{sch}).

$$SINT = \frac{\sum_{k=1}^K MOS_k}{n_{sch}}$$

4. A random number is drawn from a uniform distribution $U[0,1]$. This number is multiplied by the SINT calculated in the previous section. This is the random start. This number is the first selection number ($SELNUM_1$). The first school selected corresponds to the school where this selection number is located. For this, we go to the MOS_AC series calculated previously. So school j is selected for the sample, where j satisfies the condition

$$MOS_AC_j \leq SELNUM_1 < MOS_AC_{j+1}$$

This means that the selection number corresponds to a student within school j

5. To select the second school in the sample, we add to the initial $SELNUM$, the Sample interval (SINT) so:

$$SELNUM_2 = SELNUM_1 + SINT$$

6. The second school selected for sampling is the one that complied with the condition indicated in section 4 above, but now for $SELNUM_2$. The process continues until all the selection numbers corresponding to the number of schools to sample are calculated and the corresponding schools selected
7. Finally, for each sampled school, and where it is possible, two substitutes are selected. These schools are those contiguous to the selected school, that is, one comes before and another after the sampled school. These will be schools that can participate in case the sampled school is not able to do so. These substitute schools must not be sampled schools themselves, since they will also need to participate in the survey and

already represent another segment of the population. Also, the sampled school and substitute school must not be separated by another sampled school.

Figure 1 shows a simple example of this process. In this case, the stratum has 15 schools of various sizes. These schools have in total 1800 eligible students enrolled in the schools. We need to draw a school sample representative to this population. The sample is of 3 schools. The sample interval (SINT) is therefore 600 ($1800/3$). We draw a random number from $U[0,1]$. In this case, the number is 0.7126. that number, multiplied by the SINT results in 428. The two additional selection numbers come from adding SINT to this number, so the selection numbers are [428, 1028, 1628].

Schools are sorted by their MOS, starting with the largest school and ending with the smallest. The column **MOS_AC** is calculated, by adding the enrolment of the schools in the sorted order. The first selection number falls within the first school in the list (NAT0004). The school has 550 students, so 428 is within this school. This is the first selected school. Looking for the second school, we locate the school where 1028 is located. This corresponds to the third school in the list (NAT0005). The last selection number, 1628, is located in the ninth school in the list (NAT0008).

Each of these three schools are selected for the main survey. As it can be seen, they span across all the list of schools and have different sizes. This is because students are clustered among schools of different sizes in all circumstances. By stratifying and sorting by school size and other relevant variables, this method helps to select schools across all the strata.

Once schools are selected for sampling, substitutes are selected for each one of them where possible. As can be seen, the first school in the list was in this case selected for the survey, and one school separates it from the next sampled school. In this case, the school in the middle (NAT0003) is substitute school for both the first and second sampled school. No other school can be selected to be substitute for the first sampled school, since the rest of the schools are “blocked” by the second sampled school.

The second sampled school has two substitutes, the school following it in the list (NAT0001) and the previous one, who is also substitute for the first sampled school. To make sure all schools have at least one substitute, this school is the first substitute of the first sampled school but the second substitute for the second sampled school.

Finally, the third sampled school has two substitutes, which are contiguous to the school (NAT0008 and NAT0013). They are selected as the first and second substitute. As can be seen in the process, the schools to be selected depend on their position in the stratum, determined by their size. This also allows the substitute schools to be of similar size, in case they must participate and future weight estimates are not too different from the original estimate.

Figure 1 Example of a School Sample drawn from a stratum

AGGREGATE MOS	1800
Sample Size	3
Sample Interval (SINT)	600
Random number	0.7126
Selection Numbers	
1	428
2	1028
3	1628

#	National ID	MOS	MOS_AC	sampled?	SCHID	SCHID DUP
1	NAT0004	550	550	s	0001	
2	NAT0003	420	970	subD	1001	2002
3	NAT0005	210	1180	s	0002	
4	NAT0001	160	1340	sub1	1002	
5	NAT0015	90	1430			
6	NAT0007	80	1510			
7	NAT0013	60	1570			
8	NAT0012	40	1610	sub2	1003	
9	NAT0008	30	1640	s	0003	
10	NAT0006	30	1670	sub1	1003	
11	NAT0010	30	1700			
12	NAT0014	25	1725			
13	NAT0011	25	1750			
14	NAT0002	25	1775			
15	NAT0009	25	1800			

Once the sample is drawn, all schools not selected for the sample and substitute schools are discarded and a School Tracking Form is generated for the National centre to track school participation. This form will contain enough information to identify the school, as well as a school id generated during the sample process (SCHID). This number is generated by the combination of the selection number within the stratum where the school was selected (three right most digits) plus the initial digit, indicating if the school is the main sampled (0), first substitute (1) or second substitute (2). Figure 2 shows this list

Some substitute schools may appear more than once, as seen in the case of School NAT0003, which is substitute for both the first and second sampled school as explained above. In any case, the priority is always to facilitate the actually sampled school to participate and use substitutes as a last resort. But the School Tracking form is also used to document the school participation or reasons for their non participation or selection of a substitute school for that purpose.

Figure 2 School Tracking Form

National ID	MOS	sampled?	SCHID
NAT0004	550	s	0001
NAT0003	420	sub1	1001
NAT0003	420	sub2	2002
NAT0005	210	s	0002
NAT0001	160	sub1	1002
NAT0012	40	sub2	1003
NAT0008	30	s	0003
NAT0006	30	sub1	1003

Second stage: class and student selection

Once confirmation is received of school participation, the NC sends a request the list of graded 5 classes in the school. This information was used to draw the class sample. A random class was selected from all the classes in the school and all students in that class are selected to participate in the survey.

The process to select the class within the school is very similar to that carried out to sample the schools within the stratum. In this case however, the process is carried out using the software developed by the sampling contractor (Maple software by ACER for SEA-PLM 2024) and distributed to participating countries. For each school, a random number between 1 and the number of classes in the schools is drawn. The class for which this number corresponds is then selected for the survey and all students in the class are selected to participate. This guarantees that all students within the school have the same probability of being selected for the survey, and they selection is not done at the discretion of any person.

Figure 3 shows the output of the class sampling process. For three sampled schools (010001, 010002, 01003), the list of schools was uploaded to Maple. This list includes information regarding the School, Class Name, number of students enrolled in each class, a sequential number of the class within the school, and grade level. Once this data is uploaded in Maple, the program generates a Random draw for each school. For School 010001 the number was 2; for school 010002 it was 1, and for 010003 it was 4. Therefore each of these schools was selected for the student participation: Class 5_B, 5_I and 5_4 in each of the schools respectively.

Figure 3 Class selection output

School	Class Name	numberOfStudents	Number within school	grade	Random Draw	output
010001	5_A	40	1	5		
010001	5_B	37	2	5	2	Sampled
010001	5_C	38	3	5		
010001	5_D	33	4	5		
010002	5_I	39	1	5	1	Sampled
010002	5_II	41	2	5		
010002	5_III	38	3	5		
010003	5_1	32	1	5		
010003	5_2	30	2	5		
010003	5_3	31	3	5		
010003	5_4	31	4	5	4	Sampled

Once the class selection is done, the records of the students in each class is added to Maple for data entry and participation check during the test session. Based on the information of the list, 37 students are expected to participate from School 010001; 39 from 010002 and 31 from 010003.

Sampling yield and response rate

The final student and school participation exceeded the minimum values set forth in the SEA-PLM Sampling Framework (Standard 2.11) of 150 schools and 4000 students as can be shown in the first two columns of Table 5. In some instances, schools who could not participate were substituted with similar schools provided in the school sample. Schools who turned out to not have students in the target grade were excluded from the survey but not replaced, since they were not part of the target population. Schools with eligible students who could not be replaced meant a reduction in school participation. At the school level, some eligible sampled students refused or were absent on the day of the test. These were not substituted (Standard 2.14), which meant a reduction in student response rates. The SEA-PLM Sampling Framework indicated that a minimum response rate of 85% of schools and 80% of sampled students must be achieved so no reporting of results is included with annotations (Standard 2.13). In all cases, countries surpassed this minimum participation standard, with overall response rates above 90% in all cases for SEA-PLM 2024. Results for SEA-PLM 2024 are shown in Table 9.

Table 5 Sample yield and response rate by country SEA-PLM 2024

	2024						
	Participating schools	Participating students	Weighted school response rate - sampled schools only	Weighted school response rate - sampled and replacement schools	Weighted student response rate	Weighted overall response rate - Sampled schools only	Weighted overall response rate - sampled and replacement schools
Cambodia	195	6,574	100.00%	100.00%	99.12%	99.12%	99.12%
Lao PDR	207	4,167	99.74%	100.00%	92.81%	92.56%	92.81%
Myanmar	192	5,842	90.77%	98.17%	97.29%	88.31%	95.51%
Malaysia	158	4,379	100.00%	100.00%	97.85%	97.85%	97.85%
Philippines	156	5,070	96.71%	97.34%	96.75%	93.57%	94.17%
Timor Leste	169	4,650	99.46%	99.46%	94.41%	93.90%	93.90%
Viet Nam	152	5,980	100.00%	100.00%	99.66%	99.66%	99.66%

Secondary sample outcomes – national option

Apart from the national samples drawn for each participating country, some countries requested an additional sample of schools and students to administer a national option assessment (refer to Data Standards Additional survey component in the Regional Technical Standards). Secondary samples are not included in the computation of the national public datasets and national results. Any additional components, outside of the regional standard survey components, remain under the sole trademark and products of the Ministry of Education. In some instances, this required additional schools, and in other cases, an additional number of students selected for already sampled schools. These schools and students were selected after the school and student sampling process for SEA-PLM was carried out, to guarantee all eligible students in the population had a chance to be selected for SEA-PLM.

The results are shown in Table 6. While this analysis is beyond the scope of the SEA-PLM survey, overall, the school participation rate in all surveys was well above the minimum standard indicated in Standard 2.13 of 85%. However, in the case of student participation, all surveys except those in Timor Leste could not reach the minimum student response rate of 80% set forth in the same standard 2.13.

Table 6 Secondary sample outcomes – national option

Country	SEA-PLM 2024											
	Survey	School Sample	Non participating schools	Schools with low student response rate (< 33%)	Responding schools	School Response Rate	Student Sample	Student Exclusions	Eligible Students	Full student Responses	Student Response Rate	Overall Participation Rate
Cambodia	MLE	50	0	0	50	100.0%	891	4	887	857	96.6%	96.6%
Philippines	Filipino	50	0	1	49	98.0%	1,829	20	1,809	1,687	93.3%	91.4%
Timor Leste	Portuguese	63	0	2	61	96.8%	2,840	17	2,823	1,955	69.3%	67.1%

Annex 1- SEA-PLM 2019 sampling tables

Table 7 Population and sample coverage SEA-PLM 2019

Country	SEA-PLM 2019					
	Desired population grade 5	School-level exclusions	Target population before sampling	Schools	School sample coverage	Reasons for exclusion
Cambodia	332,677	67	332,610	7,310	100.0%	Special need education (blind students)
Lao PDR	149,030	1,012	148,018	7,074	99.3%	Less than 5 students in grade 5, International and inclusive schools
Myanmar	948,589	43,600	904,989	46,209	95.4%	Very small (<= 5 students), very remote and conflict schools
Malaysia	450,674	1,825	448,849	7,362	99.6%	Special education / Small (<= 5 students) schools
Philippines	2,316,663	113,206	2,203,457	51,147	95.1%	Five students or less / International / Islet / SEN / Conflict areas
Timor Leste	NA	NA	NA	NA	NA	NA
Viet Nam	1,391,981	57	1,391,354	15,093	100.0%	Less than 5 students in grade 5 / Internationals schools / SEN schools

Table 8 Explicit and Implicit Stratification – SEA-PLM 2019

Country	SEA-PLM 2019						
	Explicit stratification			Total Strata	Implicit stratification		
	Variable	Value labels	Levels		Variable name	Value labels	Levels
Cambodia	None			1	Geographic zone	01: plains 02: Tonlesap 03: plateau 04: coastal	4
					Region	01: urban 02: rural	2
					Child friendly school level	01: Basic 02: Medium 03: Advance	3
Lao PDR	Province	1:Vientiane Capital (VTC), 2:Phongsaly (PSL), 3:Oudomxai (OUX), 4:Luangnamtha (LNT), 5:Bokeo (BK),6: Luangprabang (LPB), 7:Huanphan (HP), 8: Xaiyabouly(XBL), 9:Xiengkhuang (XK), 10:Viengchan (VC),11:Bolikhambxai(BLKX), 12:Khammuan(KM), 13:Savannakhet(SVNK), 14:Salavan(SLV), 15:Sekong(SK), 16:Champasak(CPS), 17:Attapeu(ATP), 18:Xaisomboun(XSB)	18	18	Level of school	Complete/Incomplete	2
					Type of school	Public/Private	2
					Measure of size	≤15 / ≥16	2
					Combination between Grade 5 and other grades	Single grade/Multi grade/Missing	3

Myanmar	None			1	Regions across Myanmar	AYARWADDY - 1 BAGO (East) - 2 BAGO (West) - 3 CHIN - 4 KACHIN - 5 KAYAH - 6 KAYIN - 7 MAGWE - 8 MANDALAY - 9 MON - 10 NAYPYITAW - 11 RAKHINE - 12 SAGAING - 13 SHAN(East) - 14 SHAN(North) - 15 SHAN(South) - 16 TANINTHAYI - 17 YANGON - 18	18
					Schools in rural/urban areas	Rural - 1 Urban - 2	2
					Small school (students' size ≤ 30), Medium school (student size is $31 < N \leq 60$), Big school (student size is > 60)	Small - 1 Medium - 2 Big - 3	3
Malaysia	State	Kedah, Perlis, Pulau Pinang, Perak, Selangor, Negeri Sembilan, Johor, Melaka, Kelantan, Terengganu, Pahang, Kuala Lumpur, Putrajaya, Sabah, Sarawak, Labuan	16	16	Sector	Public, private	2
					Location	Urban, rural, remote 1, remote 2, remote 3	5
					School type	National school / Chinese National-type school / Tamil National-type school / Government-aided religious School / Indigenous National school / Private school	6
Philippines	Region	16 Regions	16	16	Division	National divisions	20
					School type	Public, private	2
					School Cluster: Total enrolment of school	400 and above / 200 - 399 / 100 - 199 / 55-99 / 20 -54 / 19 and below	6
Timor Leste	NA	NA	NA	NA	NA	NA	NA
Viet Nam	Zone	North, Central, and South	3	9	Funding	Public / Non-public	2
	Location	Urban, rural, and remote area	3				

Table 9 Student within school and school level exclusion rate SEA-PLM 2019

Country	SEA-PLM 2019							
	Students with functional disabilities	Students with a cognitive, behavioural, or emotional disability	Students with insufficient assessment language experience	Other (no longer in school, etc)	Total	Weighted exclusion rate (% of students in sampled schools)	School-level exclusion rate	Total exclusion rate
Cambodia	8	3	16	0	27	0.5%	0.0%	0.5%
Lao PDR	8	19	33	0	60	1.2%	0.8%	2.0%
Myanmar	14	58	10	0	82	1.0%	4.6%	5.6%
Malaysia	6	22	0	0	28	0.4%	0.4%	0.8%
Philippines	15	20	72	0	107	3.2%	4.9%	8.1%
Timor Leste	NA	NA	NA	NA	NA	NA	NA	NA
Viet Nam	9	21	3	0	33	0.6%	0.0%	0.6%

Table 10 Sample yield and response rate by country SEA-PLM 2019

Country	SEA-PLM 2019				
	Weighted school response rate - sampled schools only	Weighted school response rate - sampled and replacement schools	Weighted school response rate	Weighted school response rate - sampled schools only	Weighted school response rate - sampled and replacement schools
Cambodia	100.0%	100.0%	90.9%	90.9%	90.9%
Lao PDR	100.0%	100.0%	97.7%	97.7%	97.7%
Myanmar	100.0%	100.0%	98.6%	98.6%	98.6%
Malaysia	100.0%	100.0%	94.5%	94.5%	94.5%
Philippines	100.0%	100.0%	96.5%	96.5%	96.5%
Timor Leste	NA	NA	NA	NA	NA
Viet Nam	99.4%	100.0%	99.4%	98.8%	99.4%

Annex 2 – SEA-PLM 2024 Sampling Framework

Introduction

The Southeast Asia Primary Learning Metrics (SEA-PLM) is an innovative assessment developed to help measure and analyse the complex and multiple factors involved in achieving inclusive and equitable quality primary education among Southeast Asian countries.

The SEA-PLM Sampling Framework is designed to provide a template for the design and conduct of the SEA-PLM survey. It aims to meet the regional objectives of obtaining accurate estimates of fifth-grade student learning outcomes in the Southeast Asian region, enabling high-quality and consistent data collection across countries, and accommodating local and national objectives.

This framework sets out the participation standards, which aim to maximise the quality of survey outcomes across countries and over time. An account of each country's participation measured against these standards will be a component of survey reporting. The framework outlines the key roles and responsibilities with respect to sampling and survey design for the National Technical Teams (NTTs) and the sampling contractor (ACER for SEA-PLM 2024).

Defining the SEA-PLM target population

The regional target population

The regional target population for SEA-PLM is as follows:

All students enrolled in the grade representing five years of schooling, counting from the first year of ISCED Level 1, referred to in SEA-PLM as Grade 5.

The regional target population includes all students enrolled in the target grade in each participating country. This includes students from schools across all educational sub-systems and types within a country. ISCED Level 1 refers to UNESCO's International Standard Classification of Education⁶ and corresponds to the first stage of formal schooling or primary education.

Coverage and exclusions

SEA-PLM aims to provide complete coverage of the regional target population. However, a small number of exclusions at the school or student level are sometimes necessary. Furthermore, in rare cases, there may be reductions in coverage (for example, a region recently affected by a significant flood or conflict zone). For each participant, exclusions and reductions in coverage will be documented and quantified and form part of the regional reporting.

⁶ UNESCO. 2012. *International Standard Classification of Education: ISCED 2011*, p30. <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>

A 5% threshold has been adopted as the upper limit for excluding members of the survey population, whether by excluding a school or individual students within schools. The objective is to minimise exclusions as much as possible.

School-level exclusions

Schools may be excluded from the survey, mainly for practical reasons, such as increased costs or difficult survey conditions. Some examples of school-level exclusions include:

- very remote locations (inaccessibility)
- very small schools (less than five students in the target grade)
- international schools offering a curriculum other than the prescribed national curriculum
- schools catering exclusively to students who would be student-level exclusions (see student-level exclusions below)

These categories are provided as examples only. Countries are not required to adopt these categories in their sample design. Additional exclusion categories may be discussed and implemented in the sample design discussion.

Student-level exclusions

While SEA-PLM aims to be as inclusive of as many students as possible, some students from sampled schools may be unable to access the assessment and will, therefore, need to be excluded. The following are the categories for student-level exclusions.

- Students with functional disabilities—these students have physical disabilities in such a way that they cannot take the SEA-PLM test. Functionally disabled students are those with a moderate to severe permanent disability. Students with functional disabilities who can undertake the assessment should be accommodated in the test situation, within reason, rather than excluded.
- Students with intellectual disabilities—these are students who have a cognitive, behavioural or emotional disability confirmed by qualified staff, such that they are unable to take part in the SEA-PLM test. These are students who are cognitively, behaviourally or emotionally unable to follow even the general instructions of the test. Students should not be excluded solely because of poor academic performance or typical disciplinary problems. It should be noted that students with dyslexia or other such learning disabilities should be accommodated in the test situation, within reason rather than excluded.
- Students with insufficient assessment language experience—these are students who cannot read or speak the language(s) of the test and would be unable to overcome the language barrier. Such students meet **ALL** the following three criteria:
 - they are not native speakers of the assessment language(s),
 - they have limited proficiency in the assessment language(s) and
 - they have received less than one year of instruction in the assessment language(s).

Sampling and participation standards

SEA-PLM sampling standards

ACER will work with participating countries to produce a sampling plan that addresses the regional needs and requirements of the survey and takes account of local contexts and conditions and any national objectives. The study's regional goal is to produce high-quality outcomes across all participating countries. Specific standards such as sample size and the extent of exclusions are specified below and referenced to the SEA-PLM Technical Standards to meet these regional objectives.

Standard 2.1

Participating countries and contracted agency maintain an agreed upon timeline of activities for the exchange of sampling related information.

Standard 2.2

The defined national target population is agreed upon between each National Technical Team and the contracted agency responsible for supporting sampling operations. The SEA-PLM Regional Secretariat will approve this process. The SEA-PLM defined national target population covers 95% or more of the Grade 5 national target population. School exclusions and student exclusions combined do not exceed 5%. Proposed exclusions are documented and quantified in each national sampling plan. Where a country does not achieve 95% inclusion, national estimates will be reported with an annotation explicitly notes the proportion of exclusions.

Standard 2.3

The target population is sufficiently described so as to allow for the implementation of random scientific sampling procedures, including systematic sampling of schools from the most recently available lists of schools that enrol students in the defined target population, and systematic sampling of classes from the most recently available lists of classes within sampled schools.

Standard 2.4

The sampling plan for each country is agreed upon by the contracted agency responsible for supporting sampling operations in conjunction with the SEA-PLM Secretariat.

Standard 2.5

Participating countries agree upon a stratification plan with the contracted agency responsible for supporting sampling operations that achieves maximum efficiency from the sample.

Standard 2.6

Accurate sampling procedures are needed to ensure that the information derived from each assessment is sufficient to produce valid and reliable results. The contracted agency responsible for supporting sampling operations draws and documents school samples for the main survey using scientifically valid and consistent methods consistent with practice in other international large-scale assessments.

Standard 2.7

National Technical Teams will provide the contracted agency responsible for supporting sampling operations with up-to-date lists of schools, known as the sampling frame, that contains information about student enrolment in the target grade or, where not available, other equivalent and agreed-upon information indicating student enrolments at each school. In addition to student enrolment estimates, the sampling frame should include sufficient information to enable contact with sampled schools and complete information for all stratification variables agreed upon according to Standard 2.5.

Standard 2.8

National Technical Teams draw classroom-based samples within selected schools using software tools provided by the contracted agency responsible for supporting sampling operations and record all students within sampled classes in sampling tracking forms.

Standard 2.9

Unless otherwise agreed, only eligible students in the national desired target population are assessed.

Standard 2.10

The testing period is agreed upon between the National Technical Teams and the SEA-PLM Regional Secretariat and does not exceed 6 weeks. This window is flexible enough to allow for the administration, collection, and consolidation of information/data.

Standard 2.11

The minimum sample size is 150 schools and 4,000 students. In countries with fewer than 150 schools, all schools will be sampled, and an appropriate increase of within-school sample may be agreed between National Technical Teams and the contracted agency responsible for supporting sampling operations.

Standard 2.12

Notwithstanding the minimums set in Standard 2.11, sample sizes will be sufficient such that 95% confidence interval widths around estimates of major survey outcomes at the national level should be within $\pm 5\%$ for student percentage estimates and within 0.1 of a standard deviation for an estimated mean.

Standard 2.13

For survey results to be reported without annotation, countries must meet minimum school and student response rates. The final weighted school response rate is at least 85% of sampled eligible and non-excluded schools. If the school response rate is less than 85%, then an acceptable response rate may be achieved through agreed upon use of substitute schools. The final weighted student response rate is at least 80% of all sampled students across responding schools.

Standard 2.14

Absent sampled students may not be replaced by non-sampled students.

Standard 2.15

Sample weights will be calculated by the contracted agency responsible for supporting sampling operations to reflect the contribution of each participating student to the survey estimates, taking into account the sample design and adjustments for non-response.

Roles and responsibilities

Each National Technical Team (NTT) and the sampling contractor carry responsibilities at different stages of the sampling process.

Documenting the sampling plan

Several aspects of each country's sampling plan, such as the structure of schooling, coverage and exclusions, and stratification, will be documented and recorded. The sampling contractor will provide forms for the systematic recording of this information. Each NTT is responsible for providing this information to the sampling contractor accurately and according to timelines. Any proposed reductions in coverage need to be signed off by the SEA-PLM Regional Secretariat.

Preparing the sampling frame

The sampling contractor will specify a template for the database of schools, which will become the sampling frame. This is required for selecting the main survey sample. The NTT will obtain a list of all schools in the country with students that fit within the population definition and will provide this to ACER in the specified template, accurately and according to the timeline.

Selection of schools

The sampling contractor will check each country's sampling frame to ensure that the frame is suitable for sampling. For example, the sampling contractor will check that national school IDs are unique, and that values for each stratification variable are present. The sampling contractor will also check that proposed exclusions are clearly defined, justified, and minimal. The sampling contractor will work with the NTTs to finalise the sampling plan using these materials. Unless otherwise agreed, the sampling contractor will select the school samples for each country.

Calculating outcome statistics and standard errors

Following data collection, the sampling contractor will calculate various sampling outcome statistics – e.g., exclusion and participation rates, for publication in the regional report.

Sample precision and sample size

Sample size

Standard 2.11 states that a minimum of 150 schools will be sampled from each participating country or all schools if there are fewer than 150 schools in the target population. Options for participation at the school level and other sample design aspects will be discussed country-by-country. Options may include the participation of all students at the target grade, the sampling of intact classes, or other options.

Standard 2.11 is the minimum sample size only. A key criterion in determining the final sample size for each participating country will be the precision of the major estimates for the survey,

as indicated by the size of the standard errors and the widths of the 95% confidence intervals around those estimates.

Standard 2.11 notes that participating countries should aim for a sample size that achieves 95% confidence interval widths within $\pm 5\%$ for student percentage estimates and within 0.1 of a standard deviation around an estimated mean. The sample size required to achieve this precision will be estimated using evidence of design effects from previously conducted surveys, including SEA-PLM 2019, where such evidence is available. A key component of the design effect is the intra-class correlation. This statistic measures the degree to which a group of students within a school are more similar with respect to the primary outcome measures of the survey compared to students selected randomly from the entire population. Where the design effects for a country are unclear, the intra-class correlation of 0.3 will generally be assumed.

With 150 schools, an average cluster size of approximately 25 students and an intra-class correlation of 0.3, confidence interval widths are expected to be within the precision standard specified in Standard 2.11.

Stratification

Stratification falls into two categories: explicit stratification and implicit stratification. Explicit stratification partitions the sampling frame into mutually exclusive parts according to specified variables. Independent samples are then drawn from each part of the sampling frame.

Explicit stratification is usually used to implement different sample designs in different parts of the population. For example, a sample drawn for SEA-PLM may sample provinces of a country in proportion to their population size because this is the most optimal sample design to meet the regional objectives of SEA-PLM. However, an individual country may have an additional national goal for reliable estimates at the provincial level can also be obtained at that level. By explicitly stratifying the sample by province, it is possible to increase the overall minimum sample size so that a larger sample is taken from provinces to meet the additional national objective.

Implicit stratification consists of sorting the school sampling frame by a set of variables and then systematically sampling from the sorted list. It ensures a proportional allocation of students across all implicit strata.

Stratification can lead to improved reliability of estimates when the stratification variables are related to the major survey outcomes. As part of preparing each country's sample design, a stratification structure will be discussed and agreed to, as noted in Standard 2.5.

Meeting additional national objectives

For SEA-PLM, the regional objective is to obtain reliable national estimates that are consistent with respect to the quality of participation; for example, the estimates of outcomes across participating countries are similarly precise, exclusions are kept to a minimum and school and student response rates are high.

Some countries may be interested in and have funding available for implementing a supplemented sample to meet additional local objectives. The description of oversampling provinces to achieve better estimates at that level in the discussion about explicit stratification (refer to the section prior) is an example of such a scenario. In such cases, the NTT can

negotiate with the sampling contractor to modify the sample design to accommodate these additional national objectives. National objectives are, however, always secondary considerations to the regional objectives.

The sampling frame

The sampling frame will be prepared after discussions regarding the sample design. The sampling frame is prepared locally and then sent to the sampling contractor for sample selection.

The sampling frame should provide complete coverage of the defined target population without containing duplicate entries or entries referring to elements not part of the defined target population.

Each entry in the frame is a school. Each entry should include:

- a unique national school ID
- school contact information, such as name, physical address, phone number, and email address
- all stratification variables, with a value for each school
- a suitable school measure of size, for example, the total enrolment at the target grade

Refer to the *School Sampling Preparation Guide* for further information on sampling frame preparation.

Substitute schools

Every effort should be made to get as many sampled schools to participate as possible. However, it may not always be possible to obtain school participation. To minimise the potential for non-response bias arising from the non-participation of sampled schools, a mechanism will be used to identify 'replacement' or substitute schools for the sampled schools. Each sampled school will be assigned up to two substitute schools.



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