SDG 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

METADATA

Target 4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all

4.a.1 Proportion of schools offering basic services, by type of service

Definition

Percent of schools by level of education with each specified infrastructure or service.

Data sources

Two sets of data sources are used: national administrative data reported to the UIS through the UIS country questionnaire and cross-national learning assessment programme data.

Data source 1: Administrative data

Data collection: The UNESCO Institute for Statistics produces time series based on data reported by Ministries of Education or National Statistical Offices. The data are gathered through the annual Survey of Formal Education (on access to electricity, drinking water, sanitation and hand-washing facilities) and through the Survey on ICTs in Education (on access to electricity, Internet and computers). Data on adapted infrastructure are not collected currently. Countries are asked to report data according to the levels of education defined in the International Standard Classification of Education (ISCED) to ensure international comparability of resulting indicators.

The data received are validated using electronic error detection systems that check for arithmetic errors and inconsistencies and trend analysis for implausible results. Queries are taken up with the country representatives reporting the data so that corrections can be made (of errors) or explanations given (of implausible but correct results). During this process countries are also encouraged to provide estimates for missing or incomplete data items.

In addition, countries also have an opportunity to see and comment on the main indicators the UIS produces in an annual "country review" of indicators.

Updated March 2022

4.a.1 Proportion of schools offering basic services, by type of service

Calculation method: The number of schools in a given level of education with access to the relevant facilities is expressed as a percentage of all schools at that level of education.

$PS_{n,f} = S_{n,f} / S_n$

where:

$PS_{n,f}$ = percentage of schools at level n of education with access to facility f

$S_{n,f}$ = schools at level n of education with access to facility f

S_n = total number of schools at level n of education

Disaggregation: By level of education.

Treatment of missing values
At country level: The UIS estimates certain key items of data that may be missing or incomplete in order to have publishable estimates at the country level. Where this is not possible the UIS imputes missing values for use only for calculating regional and global aggregates.

In all cases estimates are based on evidence from the country itself (e.g., information from the data provider on the size of the missing component, via correspondence, publications or data on the Ministry's or National Statistical Office's Webpage, or via surveys conducted by other organizations) or on data from the country for a previous year.

Where data are available for a country for both an earlier and a more recent year than the missing year, a simple linear interpolation is made. Where data are only available for an earlier year, the most recent value is used as an estimate. Similarly, where data are only available for a more recent year, the last value is used as an estimate.

Where the relevant data are not available at all for a country, estimates may be based on another variable which is clearly linked to the item being estimated. For example, schools with access to basic services or facilities may be estimated from the total number of schools.

Where no data are available for the country in any year that can inform the estimate, the unweighted average for the region in which the country lies is used.

2

Currently no estimates are made for this indicator for the purpose of having publishable country-level data.

At regional and global levels: Regional and global aggregates are derived from both publishable and imputed national data. Publishable data are the data submitted to the UIS by Member States or the result of an explicit estimation made by the Institute based on pre-determined standards. In both cases, these data are sent to Member States for review before they are considered publishable by the UIS.

When data are not available for all countries, the UIS imputes national data for the sole purpose of calculating regional averages. These imputed data are not published nor otherwise disseminated.

The regional and global aggregates are then calculated as weighted averages using the denominator of the indicator as the weight.

Regional aggregates: Regional and global aggregates are calculated as weighted averages using the denominator of the indicator as the weight. As described previously, where publishable data are not available for a given country or year, values are imputed for the purpose of calculating the regional and global aggregates.

Sources of discrepancies: Nationally-published figures may differ from the international ones because of differences between national education systems and the International Standard Classification of Education (ISCED); or differences in coverage (i.e. the extent to which different types of education – e.g. private or special education – are included in one rather than the other).

Concepts:
  o Electricity: Regularly and readily available sources of power (e.g. grid/mains connection, wind, water, solar and fuel-powered generator, etc.) that enable the adequate and sustainable use of ICT infrastructure for educational purposes.

  o Internet for pedagogical purposes: Internet that is available for enhancing teaching and learning and is accessible by pupils. Internet is defined as a worldwide interconnected computer network, which provides pupils access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files, irrespective of the device used (i.e. not assumed to be only via a computer) and thus can also be

accessed by mobile telephone, tablet, PDA, games machine, digital TV etc.). Access can be via a fixed narrowband, fixed broadband, or via mobile network.

o Computers for pedagogical use: Use of computers to support course delivery or independent teaching and learning needs. This may include activities using computers or the Internet to meet information needs for research purposes; develop presentations; perform hands-on exercises and experiments; share information; and participate in online discussion forums for educational purposes. A computer is a programmable electronic device that can store, retrieve and process data, as well as share information in a highly-structured manner. It performs high-speed mathematical or logical operations according to a set of instructions or algorithms. Computers include the following types:

- A desktop computer usually remains fixed in one place; normally the user is placed in front of it, behind the keyboard;

- A laptop computer is small enough to carry and usually enables the same tasks as a desktop computer; it includes notebooks and netbooks but does not include tablets and similar handheld devices; and

- A tablet (or similar handheld computer) is a computer that is integrated into a flat touch screen, operated by touching the screen rather than using a physical keyboard.

o Adapted infrastructure is defined as any built environment related to education facilities that are accessible to all users, including those with different types of disability, to be able to gain access to use and exit from them. Accessibility includes ease of independent approach, entry, evacuation and/or use of a building and its services and facilities (such as water and sanitation), by all of the building's potential users with an assurance of individual health, safety and welfare during the course of those activities .

o Adapted materials include learning materials and assistive products that enable students and teachers with disabilities/functioning limitations to access learning and to participate fully in the school environment.

o Accessible learning materials include textbooks, instructional materials,

4

assessments and other materials that are available and provided in appropriate formats such as audio, braille, sign language and simplified formats that can be used by students and teachers with disabilities/functioning limitations.

o Basic drinking water is defined as a functional drinking water source (MDG 'improved' categories) on or near the premises and water points accessible to all users during school hours.

o Basic sanitation facilities are defined as functional sanitation facilities (MDG 'improved' categories) separated for males and females on or near the premises.

o Basic hand-washing facilities are defined as functional hand-washing facilities, with soap and water available to all girls and boys.

Data availability: Countries with at least one data point over the period of 2010-2019: 140 countries for electricity, 113 countries for computers, 106 countries for Internet, 109 countries for water, 103 countries for sanitation, 105 countries for hand-washing facilities and 50 countries for adapted infrastructure.

Data Source 2: Cross-national Student Assessment Data
Data collection: Data is acquired from the administrators of cross-national assessment; typically, these are available for download publicly. UIS analyses this data to provide estimates of the indicator. When there is more than one data point available for a given level of schooling (primary or secondary), an average is used as the indicator.

Estimation method: The indicator is defined as the estimated percent of schools in a given assessment's target school population which report having the specified infrastructure or service, S_i:

$$S_i = 100 \times E[\mathbf{1}\{b_i = 1\}] \tag{1}$$

where *i* denotes the specific infrastructure and b_i is binary variable defined from the dataset's questionnaires specifying whether the infrastructure or service exists at the school, $\mathbf{1}\{...\}$ denotes the indicator function which takes value 1 if the expression is true and zero if false, and $E[...]$ denotes the population mean (expected value). The estimate of S_i follows the

estimation suggested by each cross-national assessment programme using school level data. See Annex 1 for explanation of the methodology used to estimate this indicator.

Note: For SEA-PLM 2019 data, the indicator is not the percent of school but rather the percent of students at schools with the specified infrastructure or service. Estimates from PISA 2018 are labeled as lower secondary.

Concepts
Annex 1 Table 2 presents the questionnaire used to collect data in the cross-national assessments included.

Data availability
Table A.1 in annex presents the cross-national assessments for which estimates are possible.

Annex: Methods used to estimate indicator values using cross-national assessments

Cross national assessments are sample-based and, as such, provide estimates of the proportion of schools with the given facility. Estimation methods followed those suggested by the respective organization providing the cross-national assessment data. All surveys utilized a two-stage sampling procedure, randomly selecting schools and within those classes or students. School-level (first stage) data was used to estimate the percentages of schools with the given facilities. Data was weighted by school sampling weights. The population which the sample of schools represented are presented in Table A.2 in the annex.

7

4.a.1 Proportion of schools offering basic services, by type of service

Table A1. Data collection related to school environment indicators

Assessment	Target population	Data collected on the following						
		electricity	internet for pedagogical purposes	computers for pedagogical purposes	adapted infrastructure for students with disabilities	basic drinking water	single-sex basic sanitation facilities	basic hand-washing facilities (WASH)
PISA 2018	secondary schools with 15 year-old students		X	X				
TIMSS 2015/2019; PIRLS 2016 (4th grade only)	schools with 8th grade; schools with 4th grade			X				
PASEC 2014	schools with 2nd grade; schools with 6th grade	X				X		
SEAPLM 2019	5th grade students	X				X	X	
LLECE (TERCE) 2013	schools with 3rd grade; schools with 6th grade	X	X	X		X		
PASEC 2019	schools with 2nd grade; schools with 6th grade	X				X		
PISA 2015	secondary schools with 15 year-old students		X	X				

Table A.2. School questionnaire items related to SDG 4.a.1

Survey	Population	Questionnaire item	SDG 4.a.1 sub-indicator
LLECE 2013	schools with 3rd grade students; schools with 6th grade students	¿Con cuáles de estos servicios cuenta la escuela? Luz eléctrica. Sí / No Agua potable. Sí / No	Electricity and basic drinking water
		¿Cuántos computadores hay en la escuela para uso de los estudiantes? Con conexión a Internet: No hay / Entre 1 y 10 / Entre 11 y 20 / Entre 21 y 30 / Más de 30 Sin conexión a Internet: No hay / Entre 1 y 10 / Entre 11 y 20 / Entre 21 y 30 / Más de 30	Internet for pedagogical purposes; computers for pedagogical purposes
PASEC 2014	schools with 2nd grade; schools with 6th grade	65.Is there in the school...? Electricity: yes/no Piped-in water: yes/no Another source of drinking water (well, borehole...): yes/no	Electricity; drinking water
PISA 2015 & 2018	secondary schools with 15 year-old students	The goal of the following set of questions is to gather information about the student-computer ratio for students in the <national modal grade for 15-year-olds> at your school. (Please enter a number for each response. Enter "0" (zero) if there are none.) At your school, what is the total number of students in the <national modal grade for 15-year-olds>? Approximately, how many computers are available for these students for educational purposes?	Internet for pedagogical purposes; computers for pedagogical purposes

Updated March 2022

		Approximately, how many of these computers are connected to the Internet/World Wide Web?	
TIMSS 2015 4th & 8th grade	Math and science teachers' classes of 4th grade & 8th grade students (as an indicator of whether the school has computers for pedagogic use)	Do the students in this class have computers (including tablets) available to use during their mathematics lessons? Yes / No Do the students in this class have computers (including tablets) available to use during their science lessons? Yes / No	Computers for pedagogic use
PIRLS 2016	Teacher of 4th grade students (as an indicator of whether the school has computers for pedagogic use)	Do the students in this class have computers (including tablets) available to use for their reading lessons? Yes/No	Computers for pedagogic use
SEA-PLM 5th grade	Schools with 5th grade	Which of the following facilities does your school have? (e) electricity, (h) safe drinking water, yes/no Does your school have the following types of toilets? (b) separate boys toilets, (c) separate girls toilets	Electricity; drinking water, single-sex basic sanitation facilities

PASEC 2019	schools with 2nd grade schools with 6th grade	QD_78: Y-a-t-il dans l'école: (M) L'eau courante, (N) Une autre source d'eau potable (puits, forage…), (O) L'électricité [oui / non]	Drinking water, electricity